Susitna-Watana Hydroelectric Project
(FERC No. 14241)

Fish Distribution and Abundance Studies
Study Plan Sections 9.5 and 9.6

2013-2015 Radio Telemetry Implementation Report

Prepared for

Alaska Energy Authority

SUSITNA-WATANA HYDRO

Clean, reliable energy for the next 100 years.

Prepared by

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Abbreviation	Definition
ADF&G	Alaska Department of Fish and Game
AEA	Alaska Energy Authority
ATS	Advanced Telemetry Systems, Inc. (ATS)
AWC	Anadromous Waters Catalog
BW	Backwater
CIRWG	Cook Inlet Regional Working Group
CPUE	catch-per-unit-effort
CWP	clearwater plume
DIR	direct sample tributary
ELH	early life history
FA	Focus Area
FDA	fish distribution and abundance
FERC	Federal Energy Regulatory Commission
GRTS	generalized random tessellation stratified samples
FL	fork length
ILP	Integrated Licensing Process
In	Inches
IP	Implementation Plan
ISR	Initial Study Report
LR	Lower River
MC	main channel
Mm	Millimeters
MR	Middle River
PIT	passive integrated transponder
PRM	Project River Mile
Project	Susitna-Watana Hydroelectric Project
RP	river productivity
RSP	Revised Study Plan
RST	rotary screw trap
SC	side channel
SPD	study plan determination
SS	side slough
TM	tributary mouth
Trib	Tributary
TWG	technical workgroup

US	upland slough
USR	Updated Study Report

1. INTRODUCTION

On December 14, 2012, Alaska Energy Authority (AEA) filed with the Federal Energy Regulatory Commission (FERC) its Revised Study Plan (RSP), which included 58 individual study plans (AEA 2012). Included within the RSP was the Study of Fish Distribution and Abundance in the Upper Susitna River (FDAUP), Section 9.5, and the Study of Fish Distribution and Abundance in the Middle and Lower Susitna River (FDAML), Section 9.6. Following the filing of the RSP, AEA held stakeholder meetings and filed detailed study methodology in an Implementation Plan (AEA 2013) for studies 9.5 and 9.6, collectively referred to as Fish Distribution and Abundance (FDA). The FDA Implementation Plan was filed on March 1, 2013 in accordance with Commission-approved schedule. On April 1, 2013, FERC-approved the Revised Study Plans (FERC 2013) for the FDA studies with staff-recommended modifications.

The overarching goal of the FDA studies was to characterize the current distributions, relative abundances, run timings, and life histories of all resident and non-salmon anadromous species encountered as well as freshwater rearing life stages of anadromous salmonids (fry and juveniles) in the Upper, and Middle/Lower Susitna River. Adult salmon species are addressed in the Salmon Escapement Study (Section 9.7). Data collected as part of this study will be used to provide a baseline characterization of fish assemblages in the Susitna River, to identify and evaluate potential Project-induced effects on fish assemblages, and inform development of any necessary protection, mitigation, and enhancement measures. The FDA studies are designed to provide baseline biological information regarding periodicity and habitat suitability for the Instream Flow Modeling Study (see Section 8.5). Results of this study will include key life history information about fish species in the Susitna River, which will provide inputs for the Study of Fish Barriers in the Middle and Upper Susitna River and Susitna Tributaries (Section 9.12) and the Study of Fish Passage Feasibility at Watana Dam (Section 9.11).

Detailed information describing the data collection and preliminary results for the radio telemetry component of FDA was provided in the Initial Study Report (ISR) for Studies 9.5 and 9.6 Part A, Sections 4.1.5, 4.2, 4.5.2, 5.2.2, 6.2 (AEA 2014C, AEA 2014d); Study 9.5 ISR Part A, Appendix A (*Distribution of Fish Radio Ragged in the Upper Susitna River, 2013*) (LGL 2014a); Study 9.6 ISR Part A, Appendix B (*Distribution of Fish Radio Ragged in the Middle and Lower Susitna River, 2013*) (LGL 2014b); Study 9.6 ISR Part A, Appendix C (Winter Sampling Report) Sections 5, 6.1.3, 6.6 (R2 and LGL 2014a), Study 9.6 2013-2014 Winter Fish Study TM Sections 4.3.7, 4.5.2, 5.2 (R2 and LGL 2014B) and most recently in Study 9.5 and 9.6 *2014-2015 Study Implementation Reports* (SIR), Section 4.1.3 (9.5 & 9.6), 4.2 (9.5 & 9.6), 4.1.2 (9.5), 4.1.1 (9.6), 5.3 (9.6) and 5.4 (9.6) (AEA 2015a & AEA 2015b). The analytical methods and preliminary results to date have focused on reporting and updating the number of fish radio tagged, aerial survey schedules, fixed station operation schedules and monitoring efficiency, tag detection summary tables, tag distribution maps, and tracking histories for some individuals.

This TM (a supplement to Study 9.5 and 9.6 *2014-2015 Study Implementation Report* (November 9, 2015) and filed with FERC as Attachment 8 to *Response of the Alaska Energy Authority to Comments on the Initial Study Report*) provides comprehensive reporting of study methodology and detailed analysis of the resident fish radio telemetry investigations applicable to both studies,

the Study of Fish Distribution and Abundance in the Upper Susitna River (9.5) and the Study of Fish Distribution and Abundance in the Middle and Lower Susitna River (9.6).

2. RADIO TAGGING APPROACH AND OBJECTIVES

Radio telemetry was used as a remote monitoring technique to obtain spatial and temporal distribution data for individual resident and non-salmonid anadromous species. Target species for this study component were: Arctic Grayling, Burbot, Dolly Varden, Humpback Whitefish, Lake Trout, Longnose Sucker, Northern Pike, Rainbow Trout, and Round Whitefish. Dependent on the availability of each target species, radio tags were surgically implanted in up to 60 fish of sufficient body size (i.e., ≥200 grams) of each target species. For each species, up to 30 tags were allocated to the Upper River (RSP Sections 9.5.4.3.2), and up to 30 tags were allocated to the combined Middle/Lower River (RSP Section 9.6.4.3.2). Fish locations and movements were tracked from June 2013 through July 2015 using fixed-receiver stations and mobile tracking methods (see description in AEA 2013).

The FERC staff recommendation (April 1, 2013 Study Plan Determination) for Studies 9.5 and 9.6 additionally requested that:

> *To the extent possible given the constraints of field sampling conditions, we recommend that AEA target its fish sampling to meet the following specific objectives: (1) a minimum of 10 tags per species be allocated for tagging adult grayling and rainbow trout of sufficient size for spawning at tributary mouths during the spring sampling event; (2) a minimum of 10 tags should be allocated for tagging adult Dolly Varden of sufficient size for spawning at tributary mouths during a late summer or early fall sampling event; (3) a minimum of 10 tags should be allocated for tagging adult whitefish prior to spawning in early September; and (4) a minimum of 10 tags should be allocated for tagging burbot in the early fall prior to fall or winter spawning migrations.*

2.1. Upper River Study Objectives

As described in RSP Section 9.5.1, the focus of this study is to characterize the current distribution, relative abundance, run timing, and life history of resident and non-salmon anadromous species, and freshwater rearing life stages of anadromous fish (fry and juveniles) in the Susitna River upstream of the proposed dam site (PRM 187.1). Specific objectives of the radio telemetry component include the following:

Objective 2. Describe seasonal movements of juvenile salmonids and selected fish species such as rainbow trout, Dolly Varden, Humpback Whitefish, Round Whitefish, Northern Pike, Pacific Lamprey, Arctic Grayling and Burbot within the hydrologic zone of influence upstream of the Project.

> Task b. Describe seasonal movements using biotelemetry (passive integrated transponders [PIT] and radio-tags).

Objective 6. Document the seasonal distribution, relative abundance, and habitat associations of invasive species (Northern Pike).

2.2. Middle and Lower River Study Objectives

As described in RSP Section 9.6.1, this study is focused on describing the current fish assemblage including spatial and temporal distribution, and relative abundance by species and life stage in the Susitna River downstream of the proposed Watana Dam (PRM 187.1) with emphasis on early life history of salmonids and seasonal movements of selected species. Specific objectives of the radio telemetry component include the following:

Objective 2: Document seasonal movements of juvenile salmonids and selected fish species such as Rainbow Trout, Dolly Varden, Humpback Whitefish, Round Whitefish, Northern Pike, Arctic Lamprey, Arctic Grayling, and Burbot with emphasis on identifying foraging, spawning, and overwintering habitats within the mainstem of the Susitna River.

> Task b. Describe seasonal movements using biotelemetry (passive integrated transponders [PIT] and radio-tags).

Objective 4 – Document winter movements and location of spawning for Burbot, Humpback Whitefish, and Round Whitefish.

Objective 6: Document the seasonal distribution, relative abundance, and habitat associations of invasive species (Northern Pike).

3. STUDY AREA

The FDA Upper River study area as established by the Revised Study Plan (RSP 9.5.3) encompasses the mainstem Susitna River and its tributaries, from the proposed Watana Dam site (PRM 187.1) upstream to, and including, the Oshetna River (PRM 235.1) and its tributary, the Black River (Figure 3-1).

The FDA Middle and Lower River study area established by the Revised Study Plan (RSP Section 9.6.3) includes the Susitna River from PRM 65.6 (RM 61) upstream to the proposed Watana Dam site PRM 187.1, RSP Figure 9.6-1). The downstream boundary of the study area was subsequently adjusted in the Final Fish Distribution and Abundance Implementation Plan (IP; AEA 2013) to PRM 32.3 (RM 28.3) immediately upstream of the confluence with the Yentna River upstream to the Watana Dam Site (PRM 187.1, Figure 3-1).

4. METHODS

4.1. Field Methods

4.1.1. Tagging

To achieve study objectives, long-life radio tags (e.g., greater than six months) were applied to appropriate-sized fish over two study years as described in Section 5.8 of the Implementation Plan. In general, a tag-weight to fish-weight guideline of 3 percent was used to select appropriate sized fish for tagging. The range in size encountered for some target species was broad enough to warrant the use of different sized tags with different operational life specifications. Actual tag life was determined by the appropriate tag for the size of the fish available for tagging. Advanced Telemetry Systems, Inc. (ATS) coded radio tags ranging in size from 6 g to 11 g with an operational life of 180 to 901 days were used for tagging. Tagging with the smallest available tag required fish to weigh at least 200 g for safe application. For some species, such as Dolly Varden, only the largest individuals captured were of appropriate size. Tags were programmed to operate in "slow pulse" mode with 12 pulses per-minute in order to extend the operational life as much as possible. All tags were equipped with a motion sensitive sensor that would transmit a "mortality code" when a tag had remained motionless for 24 consecutive hours. Only fish that appeared healthy were selected for tagging. Candidates for tagging were evaluated for health using length/weight ratio and a physical inspection of scale loss, scaring, deformities, fungal infections, or other abnormalities. Fish selected for tagging were placed under anesthesia and radio tags were surgically implanted into the peritoneum. Post-surgery, fish were allowed to fully recover and were released at the location they were captured.

4.1.1.1. Target Species

Species targeted for radio tagging and tracking included Arctic Grayling, Burbot, Dolly Varden, Humpback Whitefish, Lake Trout, Longnose Sucker, Northern Pike, Rainbow Trout, and Round Whitefish (IP Section 5.8). Prior to the study implementation it was recognized that not all species were likely to be present or of appropriate size for tagging in both the Upper and Middle/Lower Hydrologic Segments (RSP 9.5.3.4.2 and 9.6.4.3.2).

4.1.2. Fish Capture

A wide variety of gears were utilized to capture appropriately sized fish for tagging, as detailed in IP Section 5.8.1. In the Upper River angling and beach seining were the most effective (Figure 4.1-1) while in the Middle and Lower River angling and fishwheels were the most effective (Figure 4.1-2). The lengths of radio tagged by river segment are presented in Figure 4.1-3.

4.1.2.1. Sampling Effort

4.1.2.1.1. Upper River

Sampling effort in 2013 was intended to occur during three sampling periods throughout the open water period (IP Section 5.8.1). All fish but one were tagged during the July and September sample periods in 2013. Weather conditions limited tagging effort during the late sample period. Effort

in 2014 occurred during early summer and the first half of September. This change was based on depressed fish survival when tagging during warmer water periods.

4.1.2.1.2. Middle and Lower River

Sampling effort in 2013 occurred throughout the open water period and in all three sections of the Susitna River drainage downstream from the Watana Dam site (Middle River upstream of Devils Canyon, Middle River downstream of Devils Canyon, and Lower River). Effort in 2014 occurred during the early summer of June and late fall and occurred only in the Middle River upstream of Devils Canyon.

4.1.2.2. Capture methods

4.1.2.2.1. Upper River

4.1.2.2.1.1. Angling

Angling with hook and line was an effective way to collect fish for tagging. Because it was labor and time intensive, angling was primarily used if other means of sampling were not available.

4.1.2.2.1.2. Minnow Traps (Large)

Collapsible net minnow traps were used in 2014. Minnow traps used for radio telemetry purposes were 36 in long, with a 12 in diameter, and had 5 in diameter openings on each end. These traps were larger than those used for most FDA applications to aid in the collection of fish that would be large enough to be radio tagged. Each trap was baited with frozen herring. In most cases the herring was also salted. Minnow traps were checked every 24 hours.

4.1.2.2.1.3. Fyke Nets

The fyke nets were approximately 40 feet long and consisted of two rectangular steel frames (3 feet wide by 2.5 feet high), and four steel hoops, all covered by 0.25-in delta stretch mesh nylon netting. The second rectangular frame had two 4-in wide by 28-in high openings, one on each side of the frame's center bar. The four hoops followed the second frame. The throats, 4-6 inches in diameter, were located between the second and third hoops. The net ended in a cod end bag 8 feet long with an 8-in opening at the end, which was tied shut while the net was fishing. Each fyke net was configured with two wings which were used to guide fish to the net mouth. Fyke nets were checked every 24 hours.

4.1.2.2.1.4. Hoop Traps

Hoop traps consisted of seven 0.25-in thick steel hoops with diameters that tapered from 2 feet at the entrance to 1.5 feet at the cod end. Traps were made up of 0.25-in diameter knotless delta mesh and had two necks inside. Each trap was baited with frozen or salted herring. Hoop traps were checked every 24 hours.

4.1.2.2.1.5. Beach Seine

The seine net was 75 feet long and 6 feet deep with a mesh diameter of 0.75 in. Seining was typically done using a perpendicular set technique in which one end of the net is kept on shore and the other is pulled into the river as perpendicular to the shore as possible. Both ends of the net are then walked downstream until the end of the set at which point the riverside end of the net is brought to shore and the net is pursed and fish are collected.

4.1.2.2.1.6. Backpack Electrofisher

A Smith-Root LR-24 backpack electrofisher was used for the Fish Distribution and Abundance study. Large resident fish captured via backpack electrofishing were occasionally radio tagged for this study.

4.1.2.2.2. Middle and Lower River

4.1.2.2.2.1. Rotary Screw Trap

Rotary screw traps were used for determining the timing of emigration by downstream migrating juvenile salmonids and resident fish. Large resident fish captured in the Indian River, Curry, and Talkeetna Station rotary screw traps were occasionally radio tagged for this study.

4.1.2.2.2.2. Fishwheels

Fishwheels, located at Curry, were used to determine migration timing of adult salmon for the Escapement study. Resident fish captured in the fishwheels were radio tagged for this study.

4.1.2.2.2.3. Angling

Angling with hook and line was an effective way to collect fish samples for select target species. Because it was labor and time intensive, angling was primarily used if other means of sampling were not available.

4.1.2.2.2.4. Beach Seine

The seine net used for radio telemetry purposes was 75 feet long and 6 feet deep with a mesh diameter of 0.75 inches. Seining was typically done using a perpendicular set technique in which one end of the net is kept on shore and the other is pulled into the river as perpendicular to the shore is possible. Both ends of the net are then walked downstream until the end of the set at which point the riverside end of the net is brought to shore, the net is pursed and fish are collected.

4.1.2.3. Radio Tagged Fish

4.1.2.3.1. Upper River

In the Upper Susitna River drainage 248 fish were radio tagged. Species tagged included Arctic Grayling, Burbot, Lake Trout, Longnose Sucker, and Round Whitefish. The number of each species tagged and the tagging goals are found in Table 4.1-1. A monthly total of the number of active tags-at-large for each species is presented in Table 4.1-2.

4.1.2.3.2. Middle and Lower River

In the Middle and Lower Susitna River drainage a total of 170 fish were radio tagged. Species tagged included Arctic Grayling, Burbot, Dolly Varden, Humpback Whitefish, Longnose Sucker, Northern Pike, Rainbow Trout, and Round Whitefish. The number of each species tagged and the tagging goals are found in Table 4.1-3 and Table 4.1-4. A monthly total of the number of active tags-at-large for each species is presented in Table 4.1-2. Tagging of fish extended beyond the core sampling area in the Middle/Lower River and included the lower reaches of Fish Creek (PRM 34.1), Montana Creek (PRM 80.8), and the Talkeetna River (PRM 100.5).

4.1.2.3.3. Variances

In both 2013 and 2014, adjustments were made to the timing of radio tag implementation for tracking resident fish (ISR Part A, Sections 4.5.3.2; 2014-2015 SIR, Section 4.4.2). The FERC recommendation (SPD B-135) of tagging these species immediately prior to spawning was not adopted by AEA. No pre-spawn tagging of Arctic Grayling or Dolly Varden occurred in order to avoid injury and mortality associated with tagging and handling at this fragile life stage and to maximize potential for observations of natural behavior patterns. Given tag life and seasonal tagging events, this variance did not affect AEA's ability to meet Objective 2.

4.1.3. Tracking

Fish locations and movements were tracked using fixed-receiver stations and mobile tracking methods as described in Section 5.8.2 of the Implementation Plan.

4.1.3.1. Telemetry Equipment and Approach

All receivers and transmitters were manufactured by Advanced Telemetry Systems (ATS), a manufacturer that was selected to allow tracking synergies between this and the concurrent adult salmon study (Salmon Escapement Study 9.7) that was using the same type of equipment. Aerial telemetry surveys were consistently conducted in the mainstem of the Susitna River from the mouth of the Yentna River (PRM 31.4) to the mouth of Oshetna River (PRM 235.1), along four Middle River Sloughs, and in portions of 28 tributary stream basins (Appendix A-1; Appendix A-2). Additionally, less frequent survey efforts took place in the Susitna River from its confluence with Cook Inlet (PRM 0.0) to the Yentna River (PRM 32.4) and from the Oshetna River upstream of Clearwater Creek (RPM 266.6) and in nine tributary stream basins. The survey lengths for tributaries were variable and dependent on: locations of tagged individuals on previous surveys and the current survey, distance to upstream fish barrier, daylight, weather, and fuel.

Surveys were conducted by helicopter to allow relatively accurate positioning of tagged fish and to locate potential spawning, overwintering and foraging areas. On each flight, 4-7 telemetry receivers (ATS model 4500) were wired into a pair of antennas, one attached to the nose of the aircraft facing forward, and one attached to the bottom of the aircraft facing directly downward. The crew had the ability to switch between antennas when they wanted to scan the upcoming waters versus pinpoint a tag's position.

The timing and areas covered by each mobile survey are shown in Appendix A-1; Appendix A-2. During the months surveys were conducted for the Salmon Escapement Study (Study 9.7) (July to

October), surveys were scheduled to cover each segment of the river (Lower, Middle, and Upper) at least once every seven days at a minimum. During the winter, surveys were less frequent, but aimed to survey the whole watershed at least once per month.

Geographic coordinates were recorded for each signal detected using an integrated communication link between the telemetry receiver and a global positioning system (GPS) unit. The position of the fish was determined by the position of the aircraft at the time of detection. Range testing of the mobile aerial setup was conducted in the Middle River to confirm detection ranges for typical flying heights and receiver gains, as well as to work with the helicopter pilot to refine the methods for achieving highest spatial resolution.

Fixed-station receivers used in this study (ATS model 4500 and 4520) were deployed in 16 locations during the open water season (Tables 4.1-5 and 4.1-6). Receiver locations were selected to monitor the timing of movements past (or into) a few of the main tributaries of the Susitna, while considering maximal detection efficiency (ideally deployed in relatively confined or shallow river reaches that were free of line-of-sight obstructions), ease of access, and land-use permissions. Fixed-station receivers were deployed in locked waterproof camouflaged aluminum boxes, mounted to a tree above the highest water mark, and wired to 2-3 Yagi antennas, mounted in the tree above. Each station also included antenna switching hardware, one or two 12 V batteries, and a solar panel. Antennas were aimed to detect radio tagged fish that were present downstream of the station, upstream of the station, and up a tributary (if present).

The detection range of each fixed-station was tested by drifting a radio tag at a 6-ft depth, at one-half and three-fourths of the channel width. In each case, adjustments were made to the antenna position and signal gain to ensure that tags were detectable across most of the river channel, and that there was good separation among antennas in the areas covered. Functionality of the receiver gear was monitored throughout the study period using beacon tags. A beacon tag was deployed in the vicinity of each receiver, where it reliably pinged 2,700 times per hour. Beacon tag detections were examined for each receiver as a measure of performance and monitoring efficiency on a weekly basis.

By default, fixed-station receivers 'listened' to all antennas combined, while repeatedly scanning through seven frequencies in succession. If no tags were detected, the receiver spent 15 seconds on each frequency. If a tag was detected on the combined-antenna, the receiver began scanning each antenna individually (25 seconds each), before returning to the combined-antenna mode, and moving on to the next frequency.

Fixed-station receivers performed in-situ data compression. All detections of a given tag on a given antenna during a one-minute period were condensed into a single data record, including the tag ID, date, time (accurate to the closest minute), number of detections, signal strength, and proportion of detections that were in the mortality mode. All fixed-station detections were assigned coordinates (latitude and longitude) that were considered representative of the area monitored by the receiver.

4.1.3.2. Upper River Tracking

4.1.3.2.1. Mobile Surveys

The core Upper River aerial survey extent encompassed the mainstem Susitna River and its tributaries from the proposed Watana Dam site (PRM 187.1) upstream to and including the Oshetna River (PRM 235.1) and its tributary, the Black River (Figure 3-1). On a typical aerial survey, the study area included the mainstem from the proposed Watana Dam location to the confluence with the Oshetna River and portions of the following tributaries: Deadman Creek (PRM 189.4), Watana Creek (PRM 196.6), Kosina Creek (PRM 209.1), Jay Creek (PRM 211), Goose Creek (PRM 232.9), and the Oshetna River (PRM 235.1). Because the resident fish radio telemetry surveys were paired with Salmon Escapement Study (Study 9.7) surveys, resident fish tagging locations and fish movements, at times the survey area was extended to include: the Susitna River upstream of the Oshetna River as far as PRM 309.2 including the major tributaries Tyone River (PRM 247.3) and Clearwater Creek (PRM 266.6). The following waterbodies were also surveyed on a less frequent basis: Unnamed Tributary 194.8, Sally Lake and outlet stream (Watana Creek basin), Tsisi Creek (Kosina Creek tributary), and unnamed lake and outlet stream in the Tsisi Creek basin (Kosina Creek basin), Gilbert Creek (Kosina Creek tributary), and Black River (Oshetna River tributary).

A total of 47 complete aerial surveys of the study area were conducted in the Upper Susitna River drainage including 14, 23, and 10 in 2013, 2014, and 2015, respectively. Partial aerial surveys of the Upper River, usually focused on known Chinook Salmon spawning areas as part of Salmon Escapement Study (Study 9.7), occurred on 32 additional occasions. Dates of each survey and areas surveyed are located in Appendix A-1.

4.1.3.2.2. Fixed stations

In 2013, three fixed telemetry stations were installed in the Upper Susitna River drainage. Watana Dam Site and the mouth of Watana Creek were not installed due to the lack of land access. To gather radio tag detections in this area, a fixed receiver was installed on the bluff on the north side of the Susitna River near Deadman Creek. In 2014, four stations were operated and in 2015, no stations were operated. Locations for each telemetry station, as well as the orientation of the antennas, are located in Table 4.1-5. Fixed stations were operated during the open-water period. Attempts to continue to operate remote antenna into winter were abandoned after multiple concerns about equipment malfunction. Fixed stations were not operable or operated intermittently in extremely cold temperatures. Periods of operation and monthly status are located in Table 4.1-7.

4.1.3.2.3. Variances

Section 5.8.2.1 of the Implementation Plan included four proposed locations for fixed-station receiver sites as part of the Salmon Escapement Study and FDA in the Upper River these included: Watana dam site (PRM 187.1), Watana Creek confluence (PRM 196.9), Kosina Creek confluence (PRM 209.2), and Oshetna River confluence (PRM 235.1). In 2013, fixed stations planned for the Watana Dam Site and the mouth of Watana Creek were not installed due to the lack of land access. To gather radio tag detections in this area, a fixed receiver was installed on the bluff on the north side of the Susitna River between Deadman and Watana creeks. The reduction of fixed stations

was accompanied by an increase in the frequency of mobile surveys from one survey per month during the non-salmon season as indicated in the Study Plan, to one survey every 20 days. Surveys during the salmon season increased from one survey per week to a minimum of two surveys per week. Analysis of the 2013 detection data showed that this study design allowed for more detail on the timing and location of tagged fish than would have been collected with more fixed stations and fewer mobile surveys. The increased frequency of mobile surveys more than compensated for operating fewer fixed telemetry sites as it added more observations on seasonal timing and distribution. Thus, this variance enhanced AEA's ability to meet study objectives for radio-telemetry. In 2014, four fixed radio telemetry stations were installed in the Upper Susitna River per Section 5.8.2.1 of the Final Fish Distribution and Abundance Implementation Plan (IP) filed with FERC on April 1, 2013 (AEA 2013).

In 2013, aerial surveys occurred approximately weekly from July through October. At other times of the year, the frequency and location of aerial surveys was at least monthly. In 2014, AEA increased the frequency of the mobile surveys from weekly during the salmon monitoring period and monthly during the non-salmon period (ISR Part A, Section 5.8.2.2) to a minimum of two times per week and every 20 days, respectively. An analysis of the 2013 telemetry data indicated that the mobile data provided more detail on fish timing and distribution than would have been provided by a lower frequency of mobile tracking and higher number of fixed telemetry stations as proposed in the Study Implementation Plan, such that the variance did not affect accomplishing the study objectives.

4.1.3.3. Middle and Lower River Tracking

4.1.3.3.1. Mobile Surveys

The Middle and Lower River aerial survey extent included the Susitna River from its confluence with the Yentna River (PRM 32.4) to the Watana Dam Site (PRM 187.1). In addition to the mainstem of the Susitna River, 26 tributary drainages were also regularly surveyed. The flight path for aerial surveys in the Middle and Lower River included additional streams identified in the Salmon Escapement Study (9.7) but not sampled for fish distribution and abundance. Portions of the following Middle and Lower River tributaries were flown on a routine basis: Yentna River and Fish Creek (PRM 32.4), Deshka River (PRM 44.9), Willow Creek (PRM 55.2), Kashwitna River (PRM 64.7), Sheep Creek (PRM 70.1), Montana Creek (PRM 80.9), Rabideaux Creek (87.4), Sunshine Creek (PRM 88.1), Talkeetna River (PRM 101), Chulitna River (PRM 101.7), Whiskers Creek (PRM 104.8), Lane Creek (PRM 117.1), 4th of July Creek (PRM 134.3), Gold Creek (PRM 140.1), Indian River (PRM 141.8), Jack Long Creek (PRM 148.2), Portage Creek (PRM 152.3), Cheechako Creek (PRM 155.9), Chinook Creek (PRM 160.4), Devils Creek (PRM 164.8), Fog Creek (PRM 179.3), and Tsusena Creek (PRM 184.5). Near Devils Canyon, mainstem Susitna River (PRM 152-166.9) and Portage Creek, Cheechako Creek, Chinook Creek, and Devils Creek, were surveyed more frequently in the summer as part of the Salmon Escapement Study. The mainstem from the mouth (PRM 0.0) to the Yenta River and the following Middle and Lower River waterbodies were also surveyed on a less frequent basis: Caswell Creek (PRM 67.4), Goose Creek (PRM 76.9), Birch Creek (PRM 93.5), Chase Creek (PRM 110.5), 5th of July Creek (PRM 127.3), Sherman Creek (PRM 134.1) and Unnamed Tributary 184.

A total of 60 complete aerial surveys of the study area were conducted in the Middle and Lower Susitna River drainage including 20, 37, and 3 in 2013, 2014, and 2015, respectively. Partial aerial surveys of the Middle and Lower River, usually focused on salmon spawning streams as part of Salmon Escapement Study (9.7), occurred on 152 additional occasions. Dates of each survey and areas surveyed are located in Appendix A-2.

4.1.3.3.2. Fixed stations

In 2013, 9 fixed telemetry stations were installed in the Middle and Lower Susitna River drainage. In 2014, 6 fixed telemetry stations were operated. In 2015, no stations were operated. Locations for each telemetry station, as well as the orientation of the antennas, are located in Table 4.1-6. Periods of operation and monthly status are located in Table 4.1-8.

4.1.3.3.3. Variances

In Section 5.8.2.1 of the Implementation Plan, AEA proposed that nine fixed-station receivers be operated in the Middle River in coordination with the Salmon Escapement Study while five supplemental fixed receiver stations were proposed for resident fish (9.6).

In both 2013 and 2014, there were adjustments to the number and locations of fixed receiver locations (ISR Part A, Section 4.1.7.4; 2014-2015 SIR, Section 4.1.5-3). In 2013, fixed radio telemetry stations were installed at nine locations in the Lower and Middle Susitna River. Lack of access to CIRWG land necessitated a number of changes to the quantity and location of fixed telemetry stations. Fixed stations planned for the Portage Creek (PRM 152.3), Cheechako station, Chinook Creek, and Fog Creek (PRM 179.3) were not installed due to a lack of land access. The Slough 21 station was moved to a new location slightly upstream (Powerline, PRM 146) to get as close to the CIRWG boundary as feasible.

In 2014, 10 total fixed receiver sites were used to monitor resident fish tags in the Middle and Lower River. This includes seven sites in the Middle River (Lane, Gateway, Indian River, Cheechako, Chinook, and Devils Station), Watana Dam site and three new stations that were added to the Lower River: Montana Creek weir, Susitna at Sunshine, and Talkeetna River. Stations proposed (Section 5.8.2.1 of the IP) but not monitored in 2014 included: 4th of July Creek, Indian River weir, Slough 21, Montana Creek confluence, Whiskers Creek confluence, Portage Creek confluence, and Fog Creek confluence.

The reduction of fixed stations resulted in a similar number of sites used in 2013 and, as in 2013, was accompanied by an increase in the frequency of mobile surveys from one survey per month during the non-salmon season as indicated in the Study Plan, to one survey every 20 days. Surveys during the salmon season increased from one survey per week to a minimum of two surveys per week. Analysis of the 2013 detection data showed that this study design allowed for more detail on the timing and location of tagged fish than would have been collected with more fixed stations and fewer mobile surveys. The increased frequency of mobile surveys more than compensated for operating fewer fixed telemetry sites as it added more observations on seasonal timing and distribution. Thus, this variance enhanced AEA's ability to meet study objectives for radio-telemetry.

In 2013, aerial surveys occurred approximately weekly from July through October. At other times of the year, the frequency and location of aerial surveys was at least monthly. In 2014, AEA increased the frequency of the mobile surveys from weekly during the salmon monitoring period and monthly during the non-salmon period (ISR Part A, Section 5.8.2.2) to a minimum of two times per week and every 20 days, respectively. An analysis of the 2013 telemetry data indicated that the mobile data provided more detail on fish timing and distribution than would have been provided by a lower frequency of mobile tracking and higher number of fixed telemetry stations as proposed in the Study Implementation Plan, such that the variance did not effect accomplishing the study objectives.

4.2. Analytical Methods

4.2.1. Detection Types

4.2.1.1. Fixed Stations

Fixed-station receivers performed in-situ data compression. All detections of a given tag on a given antenna during a one-minute period were condensed into a single data record, including the tag ID, date, time (accurate to the closest minute), number of detections, signal strength, and proportion of detections that were in the mortality mode. All fixed-station receiver detections were assigned coordinates (latitude and longitude) and a stream name/river mile that were considered representative of the area monitored by the receiver. Each fixed station was assigned a unique monitoring zone number.

4.2.1.2. Mobile tracking

Tag identification and GPS coordinates were archived and systematically processed after each survey. A data-handling script was used to extract a single record for each of the unique tags detected during the survey. Each record included: the tag ID; date; time (accurate to the closest second), signal-strength, coordinates (of the receiver, e.g., along aircraft flight route or handheld receiver at a tagging location) of the maximum-power detection, total number of detections, and proportion of detections that were in the mortality mode. Each tributary and reaches of the mainstem between tributaries were assigned a unique monitoring zone number.

4.2.1.3. Recaptures and Recoveries

In addition to detections of tags recorded on fixed-station receivers and during mobile tracking surveys, two radio tagged fish were recaptured, scanned and released; and two radio tagged Northern Pike were collected by anglers who reported their catch to ADF&G. The date and location of all recaptures of tagged fish were recorded and included in the detection database.

4.2.2. Data Processing

4.2.2.1. Quality Assurance Quality Control

All georeferenced release and detection data were initially processed using custom database software, Telemetry Manager (LGL Limited, Sidney, BC). Telemetry Manager facilitates data organization, record validation and analysis through the systematic application of user-defined

criteria. Temporal or spatial resolution, and noise filtering criteria, can be customized by the user without altering the raw data (English et al. 2012). Data from fixed-station receivers were imported into Telemetry Manager, where certain data were flagged for exclusion. Specifically, detections were excluded that were recorded when receivers were monitoring the combined antennas (only data from specific antennas were included). To filter out possible noise events, fixed-station records were accepted only if a tag was detected five or more times in a minute (7 hits per minute at the Fourth of July mouth). In contrast, recaptures, recoveries and mobile records (i.e., the single maximum-power location for each tag during each survey) were imported into Telemetry Manager without any initial filtration. After the appropriate records were flagged for exclusion, the remaining records were compressed into a manageable database of sequential detections for each fish. Each record in the compressed database included the tag number, detection location coordinates (latitude and longitude), the number of sequential detections at that location, and the times of the first and last detection of the series. When tags were detected simultaneously by several fixed-station receivers, the detection with the maximum power was given priority. However, mobile-tracking records (including recapture or recovery events) were always given priority over fixed-station data, as the mobile location coordinates were more informative. The compressed operational database was used for all subsequent analyses.

Positions in the operational database were reviewed and examined for spatial quality control using ArcGIS software (ESRI, Redlands, CA). This procedure involved overlaying the georeferenced operational database along with: (1) point and line GIS files that included date and time created from GPS flightpath files from aerial surveys, (2) National Hydrography Dataset (NHD) hydrography layer for the Susitna River (3) macrohabitat polygons from the Geomorphology Study (RSP Study 6.5), (4) anadromous waters catalog (AWC) hydrography layer, (5) digitized tributary centerlines for Middle and Upper River tributaries, and (6) high resolution orthophotos. A 300-meter buffer, the approximate maximum accuracy for positioning radio tags, was created around the mainstem Susitna and tributary streams. All positions occurring outside the bounds of ordinary high water (OHW) but within 300 meters of the Susitna River or a surveyed tributary stream were identified and snapped to closest mainstem feature thalweg (i.e., main channel, side channel, off-channel) using MSB 2011 moderate to high flow orthophotos or digitized centerlines for tributaries. For tributaries, all points, regardless of whether the original point was within or upstream from the ordinary high water mark were snapped to either the digitized (Middle and Upper River) or AWC (Lower River) centerlines. Positions outside of OHW near the confluence of surveyed tributaries were snapped to the closest feature. Points within OHW of the Susitna River and on dry non-vegetated bars were not moved. Positions greater than 300 meters from the Susitna River or surveyed tributary were flagged and not used in further analysis.

4.2.2.2. Mortality

All radio tags used in this study were equipment with motion activated mortality sensors. When a tag exhibited limited movement for 24 hours the tags then went into "mortality mode" and transmitted a unique signal. Fish were considered alive until the tag went into "mortality mode"; however, some tags went into "mortality mode" erroneously. These fish that were erroneously in mortality mode were identified by the continued movement of the tags after it went into "mortality mode" especially upstream movement or the recapture of the fish in question. To assign a mortality date, tags were reviewed individually and mortality codes of 60-100% were reviewed sequentially. Consistent mortality codes of 60-100% were considered valid unless the following

criteria were met: upstream movement of greater than 0.3 km, repeated downstream movements of 0.7 km or greater, movements (distance and direction) patterns similar to pre-high mortality code observations, and that the tag remained within 0.3 km of a waterbody during the time a high mortality code was transmitted. When sequential and consistently high mortality codes were detected and the aforementioned movements were not observed a fish was considered a mortality on the first detection greater than 60% mortality. During review of each tag, observations in the operational database was assigned a tag status as "live," "live with faulty mortality code," or "mortality" to aid with filtering for analysis.

4.2.2.3. Assigning Spatial Attributes

All positions in the QA/QC'd operational database were assigned a project or tributary river mile (PRM or TRM) designation to nearest tenth of a mile. River miles started at the mouth and increased in the upstream direction. All fish detections were rounded up to the next largest tenth of a mile (e.g., fish within first mile 0.9 and 1.0 of a creek were assigned to RM 1.0). Positions in the operational database were also assigned the following attributes: stream name, waterbody type (mainstem Susitna, tributary, or lake), habitat (mainstem, tributary confluence, tributary, lake), zone of hydrologic influence/maximum reservoir inundation zone (inside, outside, not applicable), relation to Watana Dam (downstream, upstream), relation to Impediment 1 (downstream, upstream), relation to Impediment 3 (downstream, upstream), and tagging segment based on where the fish was tagged and released (Middle/Lower River downstream of Impediment 1 in Devils Canyon, Middle/Lower River upstream of Impediment 3 in Devils Canyon, Upper River). Net movement distance (to nearest 0.1 mile) and direction (upstream/downstream) between sequential detections was then determined using a mainstem-tributary network approach. Tributary confluence habitat was defined as the mainstem Susitna River 0.2 mile upstream to 0.3 mile downstream of tributary mouths and 0.3 mile up the tributary (if flown as a survey zone). Zone of hydrologic influence/reservoir inundation delineation used maximum pool elevation 2,050' for the area upstream of the proposed dam site and modeling output from the geomorphology study from PRM 187.1-81, detections downstream of PRM 81 were a classified as "not applicable." A total of 45 significant tributaries (14 Lower River, 18 Middle River, and 13 Upper River) were used for defining tributary confluence areas (Table 4.2-1).

4.2.3. Characterizing Movements

4.2.3.1. Defining spawning, foraging and overwintering seasons

Movements and habitat use were characterized overall, and by season for each tagged individual. Seasons for each species included overwinter, foraging, and spawning. Spawning periods for Arctic Grayling, Burbot, Dolly Varden, Humpback Whitefish, Lake Trout, Longnose Sucker, Northern Pike, Rainbow Trout, and Round Whitefish were defined using existing literature for the Susitna River and Alaskan Rivers (Table 4.2-2; AEA 2013, 2014a, 2014b; Rutz 1996). The foraging period was defined as those months the Susitna River water temperature (when averaged between the Tsusena Creek, Gold Creek, and Sunshine monitoring stations) was above 2ºC. The overwintering period was defined as those months the Susitna River water temperature (when averaged between the Tsusena Creek, Gold Creek, and Sunshine monitoring stations) was below 2ºC (Figure 4.2-1). Temperatures were similar in the Susitna River between the Gold Creek and

Tsusena Creek locations. In 2013/2014 the overwinter period was November to April, while in 2014/2015 this was from October to April (Figure 4.2-1).

4.2.3.2. Tagging Groups

In additional to describing the movements of all tagged individuals of a given species, fish were assigned to tagging groups based on the hydrologic segment of release. Fish in the Upper Susitna River group were released in the mainstem and tributaries upstream of PRM 187. Fish in the Middle Susitna River and tributaries upstream of Devils Canyon group were released between PRM 165 and PRM 187. Fish in the Middle Susitna River and tributaries downstream of Devils Canyon and Lower River group were released downstream of PRM 154. No tags were released within Devils Canyon. Fish were analyzed within the same group regardless of their movements following release. Fish tagged in the Upper River and Middle River upstream of Devils Canyon were pooled for some analyses.

4.2.3.3. Habitat Use and Availability

To assess habitat use and use of the zone of hydrologic influence in terms of habitat availability survey effort was characterized for each aerial survey. To accomplish this, the length (miles) of each aerial survey zone was determined for each flight and summarized as the total length of surveyed mainstem, confluence, and tributary habitat and total length within and outside of the zone of hydrologic influence/reservoir inundation zone. This analysis makes no attempt to determine suitable or protected habitats but assumes that all habitat is available for rearing, spawning and/or as a migration corridor. Fish passage barriers identified in Study 9.11 were used to curtail the upper extent of available habitat in tributaries if flights continued upstream of these features. To further characterize available habitat for each tagged individual it was assumed that Devils Canyon impedes fish movements and that habitat upstream of Devils Canyon is not available to fish downstream and habitat downstream Devils Canyon is not available to fish residing upstream. For a few fish that migrated downstream through Devils Canyon, habitat availability was updated to reflect the river segment occupied at the time of aerial surveys.

4.2.3.4. Analytical Metrics

4.2.3.4.1. Monthly Tags-at-Large

The tags-at-large metric (Table 4.1-2) was developed as a means of summarizing the number and timing of active tags potentially in the study area. Tags-at-large is simply the count of active tags that have not been determined to be mortality and are expected to have battery life remaining based on the manufacturer's specifications and tag activation (implant) date. If a tag was not detected in given month but was not known as mortality, it is counted as a tag-at-large for that month. Once a tag status is determined to be mortality or is reported from a fishery the tag is removed from the tags-at-large count.

4.2.3.4.2. Monthly Tags Detected

Monthly tags detected (Table 4.2-3) is a count of fish with tag status determined to be live and detected on either aerial surveys or at fixed stations during each study month. A fish with a tag status of both live and mortality in the same month is counted as detected for that month. Monthly

tags detected gives additional detail about the seasonal distribution of data acquisition (detections) that cannot be determined from tags-at-large.

4.2.3.4.3. Detection Summary Table

A tag summary table (Appendix A; Table A-3) was created to summarize the detection history for each individual and includes the following attributes. Tag number, species, tagging segment, release location (stream and river mile), release date/time, and last live date/time were first summarized for each tag. Active tag life (days) was determined as the interval between the release date and the last live detection. Tags that were never detected following release were assigned an active tag life of 0 days. The total number of fixed and aerial receiver detections was summarized. The number independent fixed station detection events and number of unique fixed stations were summarized. The number of post-release day aerial surveys that each tag was detected. For each individual tagged the number and name of tributary and lakes waterbodies utilized over the entire tag life and by season was determined. The number of movements and direction of movement past the proposed locations for Watana Dam (PRM 187.1) were determined for each tagged individual. Linear range span, linear home range, and proportional use of habitat and inundation areas were included in the detection summary table are describe below.

4.2.3.4.4. Linear Range Span

Linear range span is the continuous linear distance that a fish swam in the mainstream and tributary habitat combined (Least Cost Path) between sequential detection events. Linear Range was based on interpolated mainstem and tributary network distance and was determined for each sequential series of tag detections. Thus, if a fish moved from the mainstem to a tributary, the linear range included the distance moved in the mainstem plus the distance moved up a tributary. Linear range among all detection series were summed to describe the total distance traveled (river miles) over the tag history. Total distance traveled was determined overall for each tagged individual and for each individual by season. The extent and range of mainstem Susitna River use by tagged fish was summarized using the interpolated maximum and minimum project river mile from the GIS river mile data layer. Interpolations were made along the mainstem GIS network. For example, if a tag entered a tributary from the mainstem, its start location was at the river mile of the tributary mouth and its end location was interpolated based on the closest river mile marker to its detection location.

Net distance and direction (upstream or downstream) were also determined monthly.

4.2.3.4.5. Linear Home Range

Linear home range was determined for each tag as the maximum span distance between upstream most and downstream most mainstem detections (Project River Miles) plus the maximum span between upstream and downstream most tributary detections (Tributary Miles). Linear home range, also described as the 100% kernel distribution, is a description of the linear range span for a series or group of detections. If more than one tributary was utilized the distances for each were summed. Linear home range was determined overall for each tagged individual and for each individual by season. Lake Trout detections, which were restricted to lake waterbodies, were not assigned a river mile, and instead linear distances between successive detections were summarized.

4.2.3.4.6. Use of Reservoir Inundation Area and Zone of Hydrologic Influence

For aerial survey detections, the proportion of detections in relation to the zone of hydrologic influence (ZHI) and reservoir inundation zone (% within) were determined. The reservoir inundation zone includes the mainstem Susitna River and tributaries upstream of the proposed location of Watana Dam (PRM 187.1) within the maximum operating reservoir water surface (elevation 2,050 feet). Areas within the ZHI may be affected by changes in mainstem flow, water elevations, and sediment transport that may potentially inhibit fish passage into, within, and out of aquatic habitats. This metric is intended to classify the overall and seasonal use of areas by fish that would be affected by the Project. Only aerial detections were used in proportional use analyses, as fixed station detection would bias results as those stations were constantly listening (seasonally) at predetermined locations.

4.2.3.4.7. Habitat Use

To determine if individual fish were utilizing habitats in proportion to availability habitat selection ratios were generated. As an initial step to generating selection ratios, each fish location was characterized as one of three habitat types. For aerial survey detections, the proportion of detections in each habitat type (mainstem non-confluence/confluence/ and tributary non-confluence) were determined. These proportions were then weighted by availability based on aerial survey extents. Only aerial detections were used in proportional habitat use analyses, as fixed station detection would bias results as those stations were constantly listening (seasonally) at predetermined mainstem and tributary confluence locations. Available habitat was determined as the average aerial survey extent (miles) for each daily survey for the reach in which a given tag was detected and included the number of river miles of following three reaches: mainstem (non-confluence), confluence, and tributary flow that day upstream from Devils Canyon, within Devils Canyon (impediment 1 to impediment 3), and downstream from Devils Canyon. Thus, each individual fish has a unique amount of habitat available based on the area surveyed on days it was relocated. Reaches were used to determine habitat availability as Devils Canyon is a known upstream passage barrier to resident fishes.

Selection ratios were then used to determine which habitats were being used/avoided and the magnitude of habitat type selectivity overall and compared between seasons (Manly et al. 2002; Rogers and White 2007). Selection ratios ($\hat{w}_i$) for each habitat type ($_i$) were calculated by dividing the proportional habitat used (number of detections in each habitat) by the proportional habitat availability (determined as river miles of each habitat type flown on days an individual tag was detected) for each individual ($_j$),

$$\hat{w}_{ij} = u_{ij+/(}\pi_i u_{+j)}$$

and for the population as a whole:

$$\hat{w}_i = u_{i+/(}\pi_i u_{++)}$$

Where u_i is the proportion of aerial detections in habitat category i relative to all detections, π_l is the proportion of available habitat (miles) in category i relative to all available habitat types. For each individual, the average survey length flown (miles) of each habitat type on surveys dates

when tag was detected and determined to be active was considered that category's availability. For each tagged fish, the proportion of points lying within each habitat category was used as a surrogate for the amount of time spent in that habitat. This assumes that the probability of obtaining a data point is equal throughout the survey area, and that survey coverage is not biased for or against any habitat types. For each species, and season, an average selection ratio was calculated for each habitat type was then calculated by averaging the across individuals.

To determine if there was significant selection for a particular habitat type, simultaneous Bonferroni confidence intervals were calculated for the selection ratios at the 100(1-α/*I*)% level where *I* is the number of intervals (one for each habitat) as

$$\hat{w} \pm z_{\alpha / 2I} SE(\hat{w}_i)$$

whereby $\alpha = 0.05$ was divided by n -1 habitat types ($N = 3$) to give a more conservative $\alpha = 0.01667$ (O'Connor and Rahel 2009).

Selection ratios greater than 1 for given habitat type indicate selection for, while ratios less than 1 indicate selection against. Selection for a habitat or depth occurs if the lower confidence interval is > 1, and selection against a habitat or depth occurs if the upper confidence interval is < 1. Confidence intervals that include 1 indicate proportional distribution across that habitat type or depth category. That is, the habitat type or depth category is neither selected for nor selected against, but rather is used in proportion to its availability. These methods avoid the problem of pseudoreplication by taking each animal as the experimental unit (Aebischer et al. 1993; Garton et al. 2001; Manly et al. 2002; Rogers and White 2007). Also, by evaluating each animal's proportional use of habitats and depths, serial correlation between an individual's data points does not present a problem (Aebischer et al. 1993; Rogers and White 2007).

The selection ratio is the proportional use of a habitat type divided by the proportional availability of that habitat type. Values can range from 0 to infinity with values near 1 indicating no evidence of selection. Values >1 represent evidence of selection for a habitat type and values <1 show evidence of selection against a habitat type. Each individual was treated as a replicate and selection ratios by habitat class were averaged across individual animals within each season (Gillingham and Parker 2008). Selection ratio analysis was then used to compare the magnitude of habitat type selectivity of each species during seasonal observational periods.

A concern with the used-versus-unused approach to fitting resource selection function models is that it may be difficult to demonstrate non-use, especially for mobile and cryptic animals. Also, non-use can depend on sampling intensity, so that a more extensive search might result in unused sites being reclassified as used sites. This means that the errors are imbalanced because we can be assured that used sites indeed have been used, but we are less certain about unused sites. The appropriate design structure is one of presence versus availability, i.e., characterizing a sample of sites where the organism is present from a sample of what is available on the landscape. Another limitation is that most telemetry data are burdened with spatial and/or temporal autocorrelation. This lack of independence means that there is an increased likelihood to commit a Type I error because variances may be underestimated. Another key assumption to any study of resource selection is that the sample of animal locations is representative of the group of animals for which inference is desired.

5. RESULTS

5.1. Arctic Grayling

5.1.1. Upper River and Middle River Upstream of Devils Canyon

The following section summarizes results for Arctic Grayling that were tagged and released upstream of Impediment 3 of Devils Canyon (PRM 164.7), which includes the upstream portion of the Middle River and the Upper River segments. Although all these fish were released upstream of Devils Canyon, the following results reflect all subsequent detections (mobile and fixed stations, recaptures, and recoveries), including any downstream of Devils Canyon.

5.1.1.1. Tagging

In 2013 and 2014, a total of 138 Arctic Grayling were radio tagged upstream of Devils Canyon. Of these fish, 27 were tagged and released in the Middle River between Impediment 3 of Devils Canyon (PRM 164.7) and the proposed Watana Dam location (PRM 187.1), while 111 were tagged and released in the Upper River between the proposed Watana Dam location (PRM 187.1) and Clearwater Creek (PRM 266.6). Tags were generally applied throughout the study area in locations where fish large enough for tagging were abundant (Table 5.1-1). In the Middle River upstream of Devils Canyon, the majority of Arctic Grayling were tagged in clearwater plume habitat associated with Fog Creek (Susitna River PRM 179.4; 10 fish), and in Tsusena Creek (PRM 184.6) near its mouth (16 fish). The primary tagging locations in the Upper River were: Kosina Creek (PRM 209.1) near the mouth (29 fish), the clearwater plume associated with Deadman Creek (Susitna River PRM 189.4; 22 fish), Watana Creek (PRM 196.9) near its mouth (16 fish), Goose Creek (PRM 232.8) near its mouth (8 fish), Oshetna River (PRM 235.1) between River Mile 18.3-21.7 (8 fish), and the clearwater plume associated with Tributary 203.4 (Susitna River PRM 203.5; 7 fish). Tagging occurred post-spawning during the Arctic Grayling foraging season in July 2013 (47), August 2013 (2), September 2013 (28), and June 2014 (61).

5.1.1.2. Tag Detection Summary

Of the 138 Arctic Grayling tagged and released upstream from Devils Canyon, 133 (96%) were detected alive at least once after the day of release and within the two years of continuous tracking. The duration of the detection period for these fish ranged from 5 to 706 days, with a median of 105 days (Table 5.1-1). Five Arctic Grayling (4%) were either not detected or were determined to be a mortality upon their first detection following release. The number of live detections (pings) for individual tags ranged from 2 to 184,673 with a median of 382. Of the 133 Arctic Grayling detected alive, 87 (65%) was detected at up to five different fixed stations; while 58 fish (44%) were detected at only one fixed station indicating a majority of tagged fish moved considerably. One-hundred-and-thirty-one fish (98%) were located during aerial surveys. The number of aerial surveys during which any individual tags were detected ranged from 1 to 37, with a median of 12 surveys. Arctic Grayling with active tags were monitored in the study area upstream of Devils Canyon over a 24-month period from July 2013 to June 2015. The total number of individual tags released upstream of Devils Canyon that were detected each month ranged from a low of 17 in May 2015 to a high of 74 in June 2014 (Table 4.2-3).

During the foraging season, all (100%) of the 133 Arctic Grayling were detected alive at least once (Table 5.1-1). Of these fish, 83 (62%) were each detected at up to five different fixed stations; 58 fish (44%) were detected at only one fixed station. One-hundred-and-twenty-eight fish (96%) were located during aerial surveys. The number of aerial surveys during which individual tags were detected ranged from 1 to 21, with a median of 10 surveys. The locations of fish detected during the foraging season are depicted in Figures 5.1-4 through 5.1-8.

During the overwintering season, 71 (53%) of the 133 Arctic were detected alive at least once (Table 5.1-1). Twenty-one of these fish (16%) were each detected at up to three different fixed stations; 15 fish (11%) were detected at only one fixed station. Seventy-one fish (53%) were located during aerial surveys. The number of aerial surveys during which individual tags were detected ranged from 1 to 17, with a median of 7 surveys. The locations of fish detected during the overwintering season are depicted in Figures 5.1-9, 5.1-10, and 5.1-16.

During the spawning season, 41 (31%) of the 133 Arctic Grayling determined to be alive after the day of release were detected live at least once (Table 5.1-1). Three of these fish (2%) were each detected at only one fixed station. Forty-one fish (31%) were located during aerial surveys. The number of aerial surveys in which tags were detected ranged from 1 to 4 with a median of 2 surveys. The locations of fish detected during the spawning season are depicted in Figures 5.1-11 and 5.1-18.

5.1.1.3. Direction, Extent, and Home Range

Overall, the total distance traveled by Arctic Grayling determined to be alive after the day of release ranged from 0.3 to 182.5 river miles; the median distance was 24.2 river miles (Table 5.1-1). The linear home range for fish tracked 60 days or more (n=88) ranged from 0.6 to 91.3 miles with a median distance of 21.7 miles.

During the foraging season, the total distance traveled by individual fish ranged from 0.3 to 134 river miles; the median distance was 16.2 river miles. The linear home range during the foraging season for fish tracked 60 days or more (n=88) ranged from 0.5 to 91.3 miles with a median distance of 12.8 miles.

During the overwintering season fish travelled less. The total distance traveled by individual fish ranged from 0.0 to 64.5 river miles and the median distance (7.2 river miles) was less than half that observed during the foraging season. The linear home range span during the overwintering for fish tracked 60 days or more (n=60) ranged from 0.0 to 32.8 miles with a median distance of 5.6 miles. Arctic Grayling generally moved less during most of the winter (November-February), but began to make pre-spawning migrations in March.

During the six-week-long spawning season (April 1 to May 15), the total distance traveled by individual fish ranged from 0.0 to 44.7 river miles, with a median distance of 5.1 river miles. Two distinct movement patterns were exhibited during the spawning period. Twelve individuals moved long distances (17.5 miles or more), while 12 individuals moved less than one mile. Some movement associated with spawning occurred during the winter (March) prior to the spawning season and some post-spawning movements occurred in late May and June. The linear home range during the spawning season for fish tracked 60 days or more (n=37) was the same as the total

distance traveled, ranging from 0 to 44.7 miles with a median distance of 5.1 miles. The similarity in these two metrics is due to the small number of aerial survey relocations during the short duration spawning season compared to other seasons.

The majority of tagged individuals utilized a 10-30 mile long reach of the mainstem Susitna River and the lower reaches of one or two tributaries during the foraging, overwintering and spawning seasons. Seasonal movements in the mainstem were directional in nature; upstream movements began near the end of the overwintering period (mid-March) and continued during spawning season (early April to mid-May), followed by post-spawn downstream movements early in the foraging season (mid-May to June). During the summer, Arctic Grayling were found in foraging habitats which included tributary lower reaches and areas at the confluence with the Susitna River, particularly in and near Kosina, Tsusena, and Watana creeks. In the summer, during periods of elevated discharge and water temperatures in the Susitna River, there was increased movement within and between tributaries and confluence areas.

As water temperatures cooled, discharge dropped, and turbidity decreased in the early fall, movement from tributaries to the mainstem were evident followed by movement into overwintering areas during the late fall. During winter, Arctic Grayling utilized the mainstem Susitna River and were typically not associated with tributaries or tributary mouths. Subsets of the population overwintered between PRM 195-199, PRM 200-209.2, and PRM 237-247/lower Tyone River. The majority of fish (n=39) overwintered in the mainstem within 6 miles of Watana Creek (PRM 196.9). There was minimal overwintering use of the Susitna River between Jay (PRM 211) and Goose (PRM 232.8) creeks.

During March and April, six individuals that overwintered between PRM 195 and PRM 209.2 made extensive upstream migrations to the Tyone River (PRM 247.3) and vicinity for spawning (April and May); three other individuals exhibited the same movement but stopped near the mouth of the Oshetna River (PRM 235.2). One Arctic Grayling (Tag 9086) was present in the Tyone River through the entire spawning season in both 2014 and 2015. Arctic Grayling were detected as far as 12 miles up the Tyone River during the spawning period. However, most fish did not migrate into the Tyone River or other tributaries during the spawning period, instead remaining near overwintering areas. Heavily used sections of the mainstem during the spawning period included: PRM 172.7-174.7 (side channel and side slough habitats in FA-173), 188.8-190.8 (Deadman Creek confluence area), 194.5-202.7 (Watana Creek confluence and wide, braided section of mainstem Susitna River upstream also used for overwintering), and PRM 220.8-224 (just downstream of Watana Canyon, also known as Vee Canyon).

Typically, the largest observed movements occurred from March-May and were associated with a transition from overwintering to spawning or foraging locations. In March, fish began moving upstream (median= 0.5 miles) under ice to spawning locations, and the greatest upstream movement occurred in April (median 7.7 miles) (Figure 5.1-1). The spawning period for Arctic Grayling in the Susitna River was adjusted to April 1 to May 15 based on these movements. This observed spawning migration is approximately a month early than the previously reported for the basin (ISR Appendix H; Table 5.1-1). The timing of Arctic Grayling migrating upstream and the use of the Tyone River by some individuals was consistent between years. Following spawning, fish made downstream movements of similar magnitude (median 6.4 miles) to previous upstream

migration, with many individuals returning to overwintering areas. A smaller downstream migration (median= 2.8 miles) to overwintering locations was observed in December.

Unlike specific foraging, overwintering, and spawning areas identified above, certain reaches appeared to be used primarily as migratory corridors by Arctic Grayling. The Upper River mainstem from Goose Creek downstream to Jay Creek (22 miles) appears to represent such a migratory corridor. Arctic Grayling passed through this area while migrating upstream to spawning and overwintering areas in and near the Tyone River and while migrating downstream to foraging and overwintering areas downstream of Jay Creek. Fish were rarely detected in this stretch of river and never for multiple detections in the same area.

Fish #9325 is an example of a highly mobile Arctic Grayling tracked for over a year that demonstrated long-distance movements. This fish utilized multiple tributaries, moved downstream and upstream past the proposed location of Watana Dam, and migrated near the Tyone River in late winter 2015 (Figure 5.1-2).

5.1.1.4. Movements Past Watana Dam Site and Devils Canyon

Of the 133 Arctic Grayling, 43 (32%) moved past the proposed Watana Dam site (PRM 187.1). All 43 fish moved downstream past the Dam site, while 12 of them (9%) also moved upstream. Of the 12 fish that made two movements past the Dam site, 7 made four movements and 5 fish made six movements. No fish were documented exclusively moving upstream past the Dam site. The frequency and direction of movements past the Dam site were variable by season; downstream movements were more common during the foraging season whereas upstream movements were more common during the spawning season (Table 5.1-2). During the foraging season, 36 Arctic Grayling (27%) exhibited a downstream movement past the Dam site while 3 (2%) moved upstream. Of the 43 downstream movements past the dam site, 33 (77%) occurred shortly after the spawning season, in late May (n=6), June (n=13), and July (n=14). Of the 71 Arctic Grayling (11%) detected in the winter, 8 moved downstream past the dam site (PRM 187.1) during the overwintering season. Four fish (6%) moved upstream past the Dam site in early winter (October). Of the 41 Arctic Grayling detected during the spawning season, 5 (12%) exhibited an upstream movement past the Dam site. No fish (0%) moved in a downstream direction past the Dam site during the spawning season.

In relation to Devils Canyon, 23 (18%) of the 133 Arctic Grayling tagged upstream of the canyon were detected downstream of Impediment 3 (PRM 164.7); 13 were detected alive and 10 were mortalities. Most downstream movements past Impediment 3 occurred during the foraging season, in June (n=4), July (n=7), August (n=3), September (n=3), and October (n=1); such movements were fewer during the winter, in November (n=2) and December (n=2), and spawning season, in May (n=1). Twelve Arctic Grayling were detected between impediments 3 and 1; most fish moved quickly downstream past the three impediments. Seventeen tagged fish (13%), were detected downstream of Impediment 1 (PRM 155.1); twelve were detected alive and five were mortalities. Most downstream movements past Impediment 1 occurred during the foraging season, in June (n=3), July (n=6), August (n=2), September (n=2), and October (n=1). A few movements were observed during the winter, in November (n=1) and December (n=1), and none were observed during spawning season, in early May.

5.1.1.5. Habitat Use

During the overall monitoring period, 130 (97%) of the 133 Arctic Grayling determined to be alive after the day of release utilized the mainstem Susitna River. One-hundred and nineteen fish (91%) entered one or more tributary streams during the monitoring period. Twenty-three fish (18%) utilized two or more tributaries. The most frequently used tributaries were Kosina Creek (n=34 fish), Tsusena Creek (n=26 fish), Watana Creek (n=25 fish), Deadman Creek (n=12 fish), Fog Creek (n=12 fish), the Tyone River (n=9 fish), Goose Creek (n=8 fish), and the Oshetna River (n=8 fish). Of the 119 fish that entered tributaries, 63 (53%) utilized only the lower 3 tenths of a mile of the tributary reaches. (TRM 0.0-0.3). Of the fish that entered tributaries, 91 (77%) were detected in the lower two miles (TRM 0.0-2.0), and only 10 fish (8%) were detected 10 or more miles upstream in tributaries. Among habitat types, 119 Arctic Grayling (91%) were detected in mainstem non-confluence areas, 127 (97%) were detected in confluence areas, and 70 (53%) were detected in tributary non-confluence areas. Mainstem non-confluence, confluence, and tributary non-confluence accounted for 48%, 39%, and 13% of all fish positions upstream from Devils Canyon from aerial surveys, respectively.

Arctic Grayling tagged upstream of Devils Canyon utilized tributary confluence habitat much more than predicted based on availability, the mean selection ratio was 4.6 (Table 5.1-3). Conversely, mainstem outside confluences, as well as non-confluence tributary habitat were utilized less than predicted based on availability, selection ratios were 0.8 and 0.6, respectively (Figure 5.1-3).

During the foraging season, Arctic Grayling were detected using the mainstem and tributaries in similar proportions. Of the 133 Arctic Grayling analyzed 130 (98%) used the mainstem Susitna River, and 118 (89%) entered one or more tributary streams (Tables 5.1-1 and 5.1-4). Seventeen fish (13%) used two or more tributaries. The most frequently used tributaries were Kosina (n=34 fish), Tsusena (n=25 fish), and Watana (n=25 fish) creeks. Of the 118 fish that entered tributaries, 63 (52%) used only the lower reaches (TRM 0.0-0.3). Of fish that entered tributaries, 92 (77%) were detected in the lower two miles (TRM 0.0-2.0), and 10 fish (8%) were detected 10 or more miles upstream in tributaries. Among mainstem habitats, 118 Arctic Grayling (89%) were detected in mainstem non-confluence areas, 106 (80%) were detected using confluence areas, and 63 (47%) were detected using tributary non-confluence areas during the foraging season Arctic Grayling used tributary confluence habitat more than predicted based on availability, the mean selection ratio was 4.9 (Figure 5.1-3). Conversely, mainstem, non-confluence and tributary habitat were utilized less than predicted based on availability, selection ratios were 0.7 and 0.5, respectively (Figure 5.1-3).

During the overwintering season, 66 of 71 (93%) Arctic Grayling utilized the mainstem Susitna River. Compared to the foraging period, considerably fewer fish, 9 (13%), entered one or more tributary streams during the overwintering period (Tables 5.1-1 and 5.1-5). Five of the 9 fish that overwintered in tributaries (7% of the total) overwintered in the lower Tyone River from TRM 0.2 to 5.3. No Arctic Grayling utilized more than one tributary stream during the winter. The most frequently used tributaries were the Tyone River (n=6 fish), Kosina Creek (n=2 fish), and Jay Creek (n=1 fish). Of the 9 fish that entered tributaries, 4 utilized only the lower reaches (TRM 0.0-0.3), 6 were detected using the lower 2 miles (TRM 0.0-2.0), and the maximum upstream distance observed in the winter was 5.3 miles.

Among habitat types, 66 Arctic Grayling (93%) were detected in mainstem non-confluence areas, 42 (59%) were detected in confluence areas, and 7 (10%) were detected in tributary non-confluence areas during the overwintering season. Arctic Grayling utilized tributary confluence habitat more than predicted based on availability although not to the degree observed during the foraging season; the mean selection ratio during winter was 2.3 (Figure 5.1-3). Mainstem, non-confluence habitat was used slightly more than predicted based on availability; the selection ratio was 1.21 ±0.15. Conversely, yet consistent with behavior during foraging season, tributary habitat was utilized less than predicted based on availability, with a selection ratio of 0.6 (Figure 5.1-3).

During the spawning season, 37 (90%) of 41 Arctic Grayling utilized the mainstem Susitna River, a proportion comparable to other seasons. Compared to the foraging period, considerably fewer fish, 6 (15%) of 41 Arctic Grayling, entered one or more tributary streams during the spawning season (Tables 5.1-1 and 5.1-6). Four of the six fish that used tributaries (10% of the total) were not observed in the mainstem during the spawning season. No Arctic Grayling utilized more than one tributary stream during the spawning season and the only tributary used was the Tyone River. Of the six fish that were observed in the Tyone River during the spawning season, most moved considerable distances, 4.7 to 13 miles up the tributary. In contrast to other seasons, no fish exclusively utilized the lower three-tenths of a mile (TRM 0.0-0.3) of the Tyone River. Rather, all six fish were observed at least 4.7 rivers miles up the Tyone and three fish traveled further than 10 river miles.

Among habitat types, there was a reduction in the proportion of fish using confluence and tributary habitat during the spawning season compared to other seasons; 35 Arctic Grayling (85%) were detected in mainstem non-confluence areas, 11 (27%) were detected in confluence areas, and 6 (15%) were detected in tributary non-confluence areas during the spawning season. Arctic Grayling used tributary confluence habitat less than during foraging and overwinter seasons; use was not different than predicted based on availability, with a mean selection ratio of 0.63 ± 0.64 (Figure 5.1-3). Mainstem, non-confluence habitat was also not different than predicted based on availability; the selection ratio was 1.25 ±0.26. Similar to the foraging and overwinter seasons, tributary habitat was utilized less than predicted based on availability, the selection ratios was 0.39 ±0.44 (Table 5.1-3).

5.1.1.6. Inundation Zone/ZHI Use

Many tagged Arctic Grayling used areas that would be within either the reservoir inundation zone upstream of the proposed Watana Dam site or within the zone of hydrologic influence (ZHI) downstream of the dam site. Seventy-three of the 133 Arctic Grayling (55%) re-located on at least one aerial survey were found within the reservoir inundation zone or ZHI (Table 5.1-1). Conversely, 7 fish (5%) were never detected within either the reservoir inundation zone or ZHI. One-hundred-and-nineteen (89%) of 133 Arctic Grayling were detected within the reservoir inundation zone or ZHI on more than half of the aerial surveys in which they were detected. Eighty-eight percent (1,525 of 1,738) of all fish detections documented upstream from Devils Canyon from aerial surveys were within the inundation zone/ZHI. Upstream of the Dam site, 89% (991 of 1,112) of all fish positions documented from aerial surveys were within the inundation zone/ZHI.

In the reach between Impediment 3 (PRM 164.7) and the Dam site (PRM 187.1), 33 (52%) of the 63 Arctic Grayling re-located by aerial survey were consistently found within either the reservoir inundation zone or ZHI. Fifty-eight (92%) of 63 Arctic Grayling were detected within the ZHI on more than half of the aerial surveys in which they were detected. Conversely, 2 fish (3%) were only detected in lower Tsusena Creek (in June and July) and were never detected within the ZHI in this reach.

During the foraging season, Upper River Arctic Grayling were typically detected migrating into tributaries or holding near tributary mouths (Figure 5.1-1 and Figures 5.1-4 through 5.1-8). Seventy-eight percent of total detections were located within the Inundation Zone, which included portions of Kosina, Watana, and Deadman creeks as well as the Susitna River, during the foraging period. In contrast, areas upstream of the Inundation Zone, including the Susitna River as well as the Oshetna and Tyone rivers and Goose and Clearwater creeks accounted for only 6 percent of Arctic Grayling detections during the foraging period. Areas in Kosina and Watana creeks upstream from the Inundation Zone accounted for only 1 percent of total detections.

In terms of individual fish, 79 (59%) of the 133 Arctic Grayling re-located on at least one aerial survey during the foraging season were found within the reservoir inundation zone or ZHI on all surveys (Table 5.1-1). Conversely, only 4 fish (3%) were neither detected within the reservoir inundation zone nor the ZHI during the foraging season. One-hundred-eighteen (89%) of 133 Arctic Grayling were detected within the reservoir inundation zone or ZHI on more than half of the aerial surveys in which they were detected during the foraging season.

During the overwintering season, the proportion of Arctic Grayling using the reservoir inundation zone/ZHI was greater than during the foraging season (Figure 5.1-9; Figure 5.1-10). Sixty-one (86%) of the 71 Arctic Grayling re-located on at least one aerial survey during the overwinter season were found within the reservoir inundation zone or ZHI on all surveys (Figure 5.1-1). There was a slight increase in the proportion of Arctic Grayling (n=9 fish; 13%), which were never detected within the reservoir inundation zone or ZHI during the winter season as compared to the foraging period. Only one fish (1%) was observed using both areas within and outside of the reservoir inundation zone or ZHI.

During the spawning season, 28 (68%) of the 41 Arctic Grayling re-located on at least one aerial survey were found within the reservoir inundation zone or ZHI on all surveys (Figure 5.1-11; Table 5.1-1). The proportion of Arctic Grayling which were never detected within the reservoir inundation zone or ZHI during the spawning season (n=6 fish; 15%) was similar to overwintering and greater than the foraging period. Thirty-five (85%) of 41 Arctic Grayling were detected within the reservoir inundation zone or ZHI on more than half of the aerial surveys in which they were detected during the spawning season.

5.1.2. Middle River downstream of Devils Canyon and Lower River

The following section summarizes results for Arctic Grayling that were tagged and released downstream of Impediment 1 of Devils Canyon (PRM 155.1), which comprises the downstream portion of the Middle River Segment. Because none of these fish were documented moving upstream beyond Impediment 1 after tagging, as described below, the following results reflect detections downstream of Devils Canyon, including reaches in both the Middle River and Lower

River segments. Use of habitat downstream of Devils Canyon by fish that were tagged at upstream locations is described in the preceding section (Section 5.1.1) and is not discussed below unless otherwise noted.

5.1.2.1. Tagging

In 2013, a total of 15 Arctic Grayling were radio tagged in the Middle River downstream of Devils Canyon. Of these fish, 11 (73%) were captured and tagged at Curry (PRM 124.2), 2 were tagged at the clearwater plume of 4th of July Creek (PRM 134.3), 1 was tagged at the clearwater plume of Indian River (PRM 142.0) and 1 was tagged at the clearwater plume of Portage Creek (PRM 152.3). All tagging occurred post-spawning, during the Arctic Grayling foraging season in June (n=11 fish), July (n=1 fish), and September (n=3 fish), 2013.

5.1.2.2. Tag Detection Summary

During the overall tracking period, 15 Arctic Grayling were detected alive at least once after the day of release and were used for subsequent analysis; the period over which they were tracked ranged from 23 to 648 days, with a median of 55 days (Table 5.1-1). The individual tracked for 648 days (Fish #9014) traveled a cumulative distance of 232.9 river-miles, and its tracking history is shown in Figure 5.1-13. The number of live detections (pings) of individual tags ranged from 8 to 54,446, with a median of 377. Twelve fish (80%) were detected at fixed stations; the number of fixed stations at which these individuals were detected ranged from 1 to 5. Five fish (33%) were only detected at one fixed station. All fish were located during aerial surveys. The number of aerial surveys during which individual tags were detected ranged from 3 to 55, with a median of 11 surveys. Monitoring downstream of Devils Canyon occurred over a 22-month period, from June 2013 to March 2015. The number of tags detected each month ranged from 0 (November 2014, January 2015) to 12 in July 2014 (Table 4.2-3). Of the 15 Arctic Grayling tagged in the Middle River downstream of Devils Canyon, 3 (20%), were detected in the Lower River downstream of the Three Rivers Confluence (PRM 102.4).

During the foraging season, all 15 Arctic Grayling tagged in the Middle River downstream of Devils Canyon were detected alive at least once (Table 5.1-1). Twelve (80%) of these fish were detected at fixed stations. The number of fixed stations at which individual fish were detected ranged from one to five; five fish (33%) were detected at only one fixed station. All 15 fish (100%) were located on aerial surveys during the foraging season. The number of aerial surveys in which individual fish were detected ranged from 3 to 45, with a median of 11 surveys. The locations of Arctic Grayling released in the Upper River and Middle River downstream of Devils Canyon during the foraging season are depicted in Figures 5.1-14 and 5.1-15.

During the overwintering season, 5 (33%) of 15 Arctic Grayling were detected at least once (Table 5.1-1). Three Arctic Grayling (20%) were each detected at up to two different fixed stations during the winter; two fish (13%) were only detected at one fixed station. Five fish (33%) were located during aerial surveys. The number of aerial surveys during which tags were detected ranged from 5 to 10, with a median of 7 surveys. The locations of fish detected during the overwintering season are depicted in Figures 5.1-16 and 5.1-17.

During the spawning season, 4 (27%) of 15 Arctic Grayling were detected at least once (Table 5.1-1). None of these fish were detected at fixed stations; all four fish (27%) were located during aerial surveys. The number of aerial surveys during which tags were detected ranged from 1 to 2, with a median of 1.5 surveys. The locations of fish detected during the spawning season are depicted in Figures 5.1-18 and 5.1-19.

The small samples sizes of fish from the first year of tagging that were detected during both the overwintering and spawning periods precludes a meaningful comparison of results across seasons for fish tagged and released downstream from Devils Canyon.

5.1.2.3. Direction, Extent, and Home Range

Overall, the total distance traveled by Arctic Grayling (n=15) ranged from 0.1 to 272 river-miles; the median distance was 39 river-miles (Table 5.1-1). The linear home range span for fish tracked 60 days or more (n=6) ranged from 25.4 to 114.2 miles. The median home range for the six fish downstream from Devils Canyon (58.4 miles) was more than double that observed for fish released upstream from Devils Canyon (21.7 miles).

The majority of tagged grayling utilized a 30-60 mile long reach of the mainstem Susitna River and the lower reaches of one tributary stream during the foraging, overwintering and spawning seasons. Seasonal movements in the mainstem were directional in nature (Figure 5.1-12); pronounced upstream movements (median distance >30 river miles, monthly) occurred during the spawning season (May) and early foraging season (June). These upstream movements were later than was observed upstream of Devils Canyon, where upstream movement occurred in late-March and April. Following these upstream movements, fish were relatively sedentary throughout the remainder of the foraging season (July-September) and utilized Portage Creek and the clearwater plume confluence areas of Portage Creek and Indian River. This pattern differed from that of the population upstream from Devils Canyon, where the earlier upstream movements in April were followed immediately by downstream movements of similar magnitude in May (Figure 5.1-1). It will be important to see if this pattern is maintained after additional tagging is completed.

In fall, as water temperatures cooled, discharge, and turbidity decreased, fish moved from tributaries to the mainstem and downstream to overwintering areas, similar to fish upstream of Devils Canyon. Fish downstream of Devils Canyon made downstream movements of 10-25 river miles (monthly) during the fall and extending into mid-winter (October-January) before exhibiting more sedentary behavior from February to April (Figure 5.1-12). The primary overwintering areas were not associated with tributaries or tributary confluence areas, but rather the mainstem Susitna River at PRM 81-88, PRM 102-110, and PRM 122-134, albeit based on a small sample size (n=5). During the spawning season, data from four Arctic Grayling did not allow for identification of spawning areas or indicate that fish were aggregating in particular locations (Figures 5.1-18 and 5.1-19). Individual fish were found to be associated with the confluence of Indian River (PRM 142.1) and non-confluence mainstem habitat in the Middle and Lower River (PRM 82-85 and 128-131). Fish #9014 is an example of a highly mobile Arctic Grayling tracked for 648 days that demonstrated long-distance upstream and downstream movements (net distance traveled=232.9 miles), utilized Portage Creek and tributary confluence areas, and overwintered in the Lower River (Figure 5.1-13).

Based on the tagging data to date, the Middle River from the mouth of Portage Creek downstream to the mouth of Indian River (10 miles) may be best characterized as a migratory corridor. Arctic Grayling passed through this section while migrating upstream to foraging areas in Portage Creek and while migrating downstream to overwintering areas downstream of Indian River, but otherwise did not appear to use this section for other life history purposes.

5.1.2.4. Movements Past Watana Dam and Devils Canyon

No Arctic Grayling tagged downstream of Devils Canyon exhibited an upstream movement past Impediment 1 (PRM 155.1), Impediment 3 (PRM 164.7), or the proposed Watana Dam location (PRM 187.1).

5.1.2.5. Habitat Use

During the overall monitoring period, all 15 Arctic Grayling were documented using the mainstem Susitna River at least once. The mainstem Susitna River was used during all seasons and exclusively during the overwintering and spawning seasons (Figures 5.1-14 through 5.1-19). Twelve of fifteen Arctic Grayling (80%) used tributary habitat during the monitoring period. Tributaries were used exclusively during the foraging season (Figures 5.1-14 and 5.1-15) and no fish utilized more than one tributary. The most frequently used tributaries were Portage Creek (10 fish), Indian River (1 fish), and Lane Creek (1 fish). In addition to these tributaries, the lower two miles of the Kashwitna River was used by an Arctic Grayling tagged in the Upper River that migrated downstream through Devils Canyon. Of the twelve fish that entered tributaries, 2 (17%) utilized only the lower three-tenths of a mile (TRM 0.0-0.3), five (42%) were detected in the lower two miles (TRM 0.0-2.0), and three fish (25%) were detected 10 or more miles upstream in Portage Creek. Respectively, Portage Creek and Indian River accounted for 56% and 12% of all aerial survey detections during the foraging season.

Among habitat types, 14 Arctic Grayling (93%) were detected using mainstem non-confluence areas, 14 (93%) were detected using confluence areas, and 11 (73%) were detected using tributary non-confluence areas. Mainstem non-confluence, confluence, and tributary non-confluence areas accounted for 25%, 22%, and 52% of all fish positions downstream of Devils Canyon from aerial surveys, respectively. Arctic Grayling tagged downstream of Devils Canyon utilized tributary confluence habitat more than predicted based on availability; however, the section ratio overlapped with 1 (Figure 5.1-20; selection ratio = 3.5±3.1). Conversely, mainstem non-confluence habitat was utilized significantly less than predicted based on availability (Figure 5.1-20; selection ratio = 0.5±0.4). Observed use of tributary habitat more closely approximated use predicted based on availability (selection ratio = 1.3±0.7; Table 5.1-1). Patterns of availability predictions and observed use of tributary confluence (more than predicted) and mainstem habitats (less than predicted) were similar downstream and upstream of Devils Canyon. In contrast, observed use of tributary habitat was higher than predicted downstream of Devils Canyon and lower than predicted upstream of Devils Canyon. Fish upstream from Devils Canyon were often located at the mouths of tributaries while fish downstream of Devils Canyon were more often found further upstream in tributaries. Seasonal selection ratios are presented in Table 5.1-1; however, samples sizes were not sufficient to compare seasonal habitat use.

5.1.2.6. Use of Zone of Hydrologic Influence

Three of fifteen (20%) Arctic Grayling were within the ZHI on all aerial surveys during which they were detected. Conversely, 2 fish (13%) tagged at Curry (PRM 124) moved upstream into Portage Creek and were never detected within the ZHI on aerial surveys. Seven (47%) of fifteen Arctic Grayling were detected within the ZHI on more than half of the aerial surveys in which they were detected. Tagged fish only used tributary reaches upstream from the ZHI during the foraging season (Figures 5.1-14 and 5.1-15). Forty-five percent (145 of 317) of all Arctic Graying positions downstream of Devils Canyon from aerial surveys were within the ZHI. Samples sizes from the initial year of tagging were insufficient to compare seasonal use of the ZHI.

5.2. Burbot

5.2.1. Upper River and Middle River Upstream of Devils Canyon

5.2.1.1. Tagging

In 2013 and 2014, a total of 45 Burbot were radio tagged upstream of Devils Canyon. Five Burbot were tagged and released in the Middle Susitna River upstream of Devils Canyon, between Impediment 3 (PRM 164.7) and the proposed Watana Dam location (PRM 187.1). Forty fish were tagged in the Upper River between the proposed Watana Dam location (PRM 187.1) and the confluence of the Tyone River (PRM 247.3). Tags were generally distributed throughout the study area in locations where Burbot of appropriate size for tagging were abundant (Table 5.1-1). In the Middle River upstream of Devils Canyon, Burbot were tagged just downstream of the proposed dam site and near Tsusena Creek, between PRM 183.8 and 186.8. The primary tagging locations in the Upper River were: Watana Creek (PRM 196.9) near the mouth (11 fish), the Susitna River within a mile of Jay Creek, PRM 210-211 (7 fish), the Susitna River at PRM 203.5 (5 fish), and the Susitna River at PRM 247.3 near the confluence of the Tyone River (5 fish). Tagging occurred during the Burbot foraging season in September 2013 (7), June 2014 (14), and September 2014 (24).

5.2.1.2. Tag Detection Summary

Burbot tagged in the Upper River and Middle River upstream of Devils Canyon with one or more live detections following the release day (n=44) were tracked for 4 to 638 days with a median 236 days (Table 5.1-1). One tagged Burbot was determined to be a mortality on the first detection, thirteen days after release. The number of live detections (pings) received by individual tags ranged from 1 to 93,843 with a median of 156. Twenty-three Burbot (52%) tagged upstream from Devils Canyon were detected at fixed stations, Burbot were never detected at more than one fixed station. Forty-three tagged fish (99%) were located on aerial surveys. The number of aerial surveys in which tags were detected ranged from 1 to 39 with a median of 14 surveys. Burbot with active tags were monitored in the study area upstream of Devils Canyon over a 22-month period (September 2013 to June 2015). The number of tags detected each month released upstream of Devils Canyon ranged from a low of 3 in November 2013 to a high of 38 in September 2014 (Table 4.2-3).

Of the forty-four Burbot tagged in the Upper River and Middle River upstream of Devils Canyon 100% were detected alive on one or more occasions during the foraging season (Table 5.1-1). Twenty-three (52%) were detected at fixed stations during foraging, each of which was only ever detected at a single station. Forty-three tagged Burbot (99%) were located on aerial surveys. The number of aerial surveys in which tags were detected ranged from 1 to 19 with a median of 4 surveys. The locations of Burbot released in the Upper River and Middle River upstream of Devils Canyon during the foraging season are depicted in Figures 5.2-1 and 5.2-2.

Thirty-five Burbot (77%) tagged in the Upper River and Middle River upstream of Devils Canyon were detected alive on one or more occasions during the overwintering season (Table 5.1-1). Nine (20%) were detected at fixed stations during the winter, each of which was only ever detected at a single station. Thirty-five tagged Burbot (77%) were located on aerial surveys. The number of aerial surveys in which tags were detected ranged from 1 to 16 with a median of 9 surveys. The locations of Burbot released in the Upper River and Middle River upstream of Devils Canyon during the overwintering season are depicted in Figures 5.2-3 and 5.2-4.

Twenty-six Burbot (59%) in the Upper River and Middle River upstream of Devils Canyon were detected alive on one or more occasions during the spawning season (Table 5.1-1). No Burbot tagged upstream from Devils Canyon were detected at fixed stations during the spawning season; twenty-six were located on aerial surveys. The number of aerial surveys in which tags were detected ranged from 2 to 4 with a median of 2 surveys. The locations of Burbot released in the Upper River and Middle River upstream of Devils Canyon during the spawning season are depicted in Figures 5.2-5 and 5.2-6.

5.2.1.3. Direction, Extent, and Home Range

Total distance traveled for active Burbot tags ranged from 0.0 to 53.6 river miles, the median distance was 10.4 river miles (Table 5.1-1). Linear home range span for fish tracked 60 days or more (n=36) ranged from 1.0 to 23.5 miles with a median distance of 3.3 miles.

Total distance traveled by Burbot during the foraging season ranged from 0.0 to 39.9 river miles, the median distance was 3.3 river miles. Linear home range span during the foraging season for fish tracked 60 days or more (n=36) ranged from 0.1 to 23.5 miles with a median distance of 2.6 miles.

The extent of Burbot movement and home range were similar between foraging and overwintering seasons. The total distance these fish traveled during the overwintering season ranged from 0.1 to 22.5 river miles, the median distance was 4.1 river miles. Linear home range span during the overwintering season for fish tracked 60 days or more (n=32) ranged from 0.1 to 22.2 miles with a median distance of 2.4 miles.

Total distance traveled during the six-week-long Burbot spawning season (January 15 to February 28) ranged from 0 to 6.7 river miles, the median distance was 0.3 river miles. Most individuals did not appear to make a substantial movement or migration for spawning and remained the in vicinity of overwintering locations. Linear home range span during the spawning season for fish tracked 60 days or more (n=21) was similar to distance traveled during this short season, and ranged from 0 to 6.7 miles with a median distance of 0.3 miles.

The majority of tagged Burbot used a 2-10 mile long reach of the Upper Susitna River mainstem and occasionally the lower reach a tributary stream within that reach during the foraging, overwintering and spawning seasons. The tagged population of Burbot exhibited small seasonal movements in the mainstem Susitna River that were directional in nature; very slight upstream movements (median monthly 0.1 to 0.2 RM) were observed during the spawning season and post-spawn overwintering season (March-April) followed by a median downstream movement of more than a mile during the early foraging season (May) coinciding with breakup and snowmelt runoff (Figure 5.2-7). Movements were then sporadic and did not appear to follow a directional pattern during the remainder of the foraging season. At the beginning of the overwintering period (November, during freeze-up) a downstream median movement of approximately 0.6 miles was observed prior to fish being mostly sedentary during the winter (Figure 5.2-7).

Burbot did not appear to aggregate during any season, and did not make long-distance movements, or distinct migrations. During the foraging season, ten Burbot (23%) utilized a five-mile segment of the mainstem from PRM 192-197, four fish (9%) utilized a two-mile segment of the mainstem from 202-204.3, four fish (9%) utilized a two-mile segment of the mainstem between Kosina and Jay creeks PRM 209-211, four fish (9%) utilized a three-mile segment of the mainstem between just downstream of the Tyone River PRM 244.3-247.3, and three fish (7%) utilized a one-mile segment near the proposed dam site, (PRM 186.3-187.2). Twelve Burbot (27%) utilized the extreme lower reach of Watana Creek (PRM 0-0.1) during the foraging season (Figure 5.2-1). During the spawning season, most Burbot (73%) utilized small portions of the mainstem between PRM 190.3 and 213; fish were spread evenly along this section (Figure 5.2-3). Two fish (8%) utilized the mainstem between Goose Creek and the Oshetna River (PRM 233-235) and two fish (8%) were detected just downstream of the Tyone River, PRM 246.5-247.2. During overwintering, fish were spread out fairly evenly and used the mainstem between PRM 174 and Jay Creek (PRM 211) and from PRM 230 to Tyone River (PRM 247.3; Figures 5.2-5 and 5.2-6). Similar to Arctic Grayling, there was minimal overwinter use of the Susitna River between Jay (PRM 211) and Goose (PRM 232.8) creeks including Watana Canyon.

Based on tag detections Burbot rarely used or migrated through an eighteen-mile stretch of Upper Susitna River (PRM 214-232) from near Goose Creek (PRM 232.8) to just upstream of Jay Creek (PRM 211). Burbot detections in this stretch of river (n=5), account for only 6% of all aerial detections. The tracking history of Burbot tagged upstream (n=7) and downstream (n=38) of this stretch of river suggests that there is little interaction between tag groups. Only one Burbot (Tag 9517) exhibited a movement through Watana Canyon (PRM 225-226.5); that movement was downstream in direction. Tag 9343 was monitored over a 382-day period and is an example of a typical Burbot tracking history (Figure 5.2-8). This individual, tagged and released at the Watana Creek mouth (PRM 196.9), traveled a cumulative 28.7 miles within a linear home range of 4.8 miles (Figure 5.2-8). The overwintering and spawning periods were spent between PRM 198.2-200.5 while a portion of the foraging period was spent just downstream near Watana Creek.

5.2.1.4. Movements Past Watana Dam Site and Devils Canyon

Five of the 44 Burbot (11%) tagged upstream of Devils Canyon exhibited movement past the proposed Watana Dam location (PRM 187.1). Three fish exhibited both upstream and downstream movements, one fish moved only upstream, and one fish moved only downstream. Some individuals made multiple passes; in total the five fish moved passed the dam site on 17 occasions.

Movements past the proposed dam location are summarized in Table 5.1-2. The number of movements past the dam site was variable by season, with most occurring during the foraging season (5 fish, 11 movements), followed by the overwintering season (2 fish, 6 movements). Movements past the dam sites occurred in 5 months; September (6) and October (7) followed by June (2), November (1) and December (1). No fish moved past the dam site during the spawning season.

No Burbot tagged upstream from Devils Canyon exhibited a movement downstream past Impediments 3 or 1 (PRM 164.7 and 160.5, respectively).

5.2.1.5. Habitat Use

All forty-four Burbot (100%) utilized the mainstem Susitna River during the monitoring period. Seventeen of 44 Burbot (39%) entered one tributary stream during the monitoring period. No fish (0%) utilized two or more tributaries. The most frequently used tributaries by Burbot upstream from Devils Canyon were, Watana Creek (12 fish), Tyone River (3 fish), Kosina Creek (1 fish), and Unnamed Tributary 203.4 (1 fish). Of the 17 fish that entered tributaries, 16 (94%) utilized only the lower three-tenths of a mile (TRM 0.0-0.3). No Burbot (0%) were detected more than 1.2 miles upstream in tributaries. Among habitat types, 43 Burbot (98%) were detected in mainstem non-confluence areas, 35 (80%) were detected in confluence areas, and 2 (5%) were detected in tributary non-confluence areas. Mainstem non-confluence, confluence, and tributary non-confluence accounted for 73%, 27%, and <1% of all fish positions upstream from Devils Canyon from aerial surveys, respectively.

Burbot tagged upstream of Devils Canyon utilized tributary confluence habitat more than predicted based on availability, the mean selection ratio was 3.4 (Figure 5.2-9; Table 5.1-3). Mainstem, non-confluence areas were used slightly more than predicted based on availability 1.3. Conversely, tributary habitat was utilized much less than predicted based on availability, with a selection ratio of 0.05 (Figure 5.2-9).

All forty-four Burbot (100%) utilized the mainstem Susitna River during the foraging period. Fifteen of 44 Burbot (34%) entered one tributary stream during the foraging period (Tables 5.1-1 and 5.1-4). No fish utilized two or more tributaries. The most frequently used tributaries by Burbot tagged upstream from Devils Canyon were, Watana Creek (12 fish), Tyone River (2 fish), and Unnamed Tributary 203.4 (1 fish). Of the 15 fish that entered tributaries, 14 (94%) utilized only the lower three-tenths of a mile (TRM 0.0-0.3). No Burbot (0%) were detected more than 1.2 miles upstream in tributaries during the foraging period. Among habitat types, 40 Burbot (91%) were detected in mainstem non-confluence areas, 34 (77%) were detected in confluence areas, and 2 (5%) were detected in tributary non-confluence areas. Mainstem non-confluence, confluence, and tributary non-confluence accounted for 69%, 31%, and <1% of all fish positions upstream from Devils Canyon from aerial surveys, respectively.

During the foraging season, Burbot tagged upstream of Devils Canyon utilized tributary confluence habitat more than predicted based on availability, the mean selection ratio was 3.8 (Table 5.1-3). Mainstem, non-confluence areas were used slightly more than predicted based on availability 1.3. Conversely, tributary habitat was utilized much less than predicted based on availability, with a selection ratio of 0.05 (Figure 5.2-9).

All 35 Burbot detected during the overwintering season, utilized the mainstem Susitna River during overwintering. Compared to the foraging season the proportion of fish utilizing a tributary was reduced with only four Burbot (11%) entering one tributary stream during the overwintering period (Tables 5.1-1 and 5.1-4). Consistent with other seasons no fish (0%) utilized two or more tributaries. The most frequently used tributaries by fish tagged upstream from Devils Canyon were, Tyone River (2 fish), Watana Creek (1 fish), and Kosina Creek (1 fish). The four fish that entered tributaries used only the lower three-tenths of a mile (TRM 0.0-0.3). Among habitat types, 34 Burbot (97%) were detected in mainstem non-confluence areas, 19 (54%) were detected in confluence areas, and 0 (0%) were detected in tributary non-confluence areas. Mainstem non-confluence, confluence, and tributary non-confluence accounted for 77%, 23%, and 0% of all fish positions upstream from Devils Canyon from aerial surveys, respectively.

During the overwintering season, Burbot tagged upstream of Devils Canyon utilized tributary confluence habitat more than predicted based on availability, the mean selection ratio was 3.4 (Table 5.1-3). Mainstem, non-confluence areas were used slightly more than predicted based on availability 1.3. Conversely, tributary habitat was utilized much less (no use) than predicted based on availability, with a selection ratio of 0.0 (Figure 5.2-9).

All Burbot detected during the spawning season, utilized the mainstem Susitna River. Compared to the other seasons the proportion of fish utilizing a tributary was reduced. No Burbot entered any tributary streams during the spawning period (Tables 5.1-1 and 5.1-4). Among mainstem habitat types, 22 Burbot (85%) were detected in mainstem non-confluence areas, 9 (35%) were detected in confluence areas, and 0 (0%) were detected in tributary non-confluence areas. Mainstem non-confluence, confluence, and tributary non-confluence accounted for 75%, 25%, and 0% of all fish positions upstream from Devils Canyon from aerial surveys, respectively.

During the spawning season, Burbot tagged upstream of Devils Canyon did not utilize tributary confluence or mainstem non-confluence habitat more than predicted based on availability; the mean selection ratios were 1.5 and 1.2, respectively (Table 5.1-3). While selection ratios were greater than one, confidence levels overlapped with 1 indicating no selection (Figure 5.2-9). The selection ratio for confluence habitat was greatly reduced during spawning, 1.5 compared to 3.8 and 3.4 for foraging and overwintering, respectively (Table 5.1-3). Consistent with foraging and overwintering seasons, tributary habitat was utilized much less (no use) than predicted based on availability during spawning, with a selection ratio of 0.0 (Figure 5.2-9).

5.2.1.6. Inundation Zone/ZHI Use

Burbot tagged upstream of Devils Canyon primarily utilized areas that would be within the Watana Dam reservoir inundation zone upstream and the zone of hydrologic influence downstream. At the proposed dam site, thirty-seven of the 44 Burbot (84%) re-located on at least one aerial survey were found within the reservoir inundation zone or ZHI on all surveys (Table 5.1-1). Conversely, 4 fish (9%) were never detected within the reservoir inundation zone or ZHI. Thirty-eight of 44 Burbot (86%) were detected within the reservoir inundation zone or ZHI on more than half of the aerial surveys in which they were detected. Ninety-two percent (542 of 590) of all fish positions upstream from Devils Canyon from aerial surveys were within the inundation zone or ZHI. Upstream of the proposed Watana Dam site, 91% (494 of 542) of all Burbot positions from aerial surveys were within the reservoir inundation zone. Burbot detections outside of the inundation

zone occurred in the Susitna and Tyone rivers upstream of the full pool elevation (PRM 232.5) of the proposed reservoir. No Burbot were detected upstream of the reservoir inundation zone in tributaries that would be partially inundated by the reservoir. In the reach between Impediment 3 (PRM 164.7) and the proposed dam site (PRM 187.1), all six Burbot (100%) re-located on at least one aerial survey were found within the ZHI on all surveys.

Burbot use of the inundation zone/ZHI was consistent among seasons. During the foraging period, Burbot upstream of Devils Canyon were dispersed throughout mainstem, 96% of detections were within the inundation zone/ZHI with some detection clusters near tributary mouths (Figure 5.2-1; Figure 5.2-2). Burbot were detected upstream of the inundation zone in the Susitna River and the lower Tyone River, accounting for around 4 percent of all Burbot detections during the foraging period. The reservoir inundation zone, including the Susitna River as well as Watana Creek and Unnamed Tributary 203.4 accounted for 92 percent of detections during the foraging period. No Burbot were detected upstream of the reservoir inundation zone in tributaries that would be partially inundated by the reservoir during the foraging period (Figure 5.2-1). Thirty-eight of 44 Burbot (86%) re-located on at least one aerial survey during the foraging season were found within the reservoir inundation zone or ZHI on all surveys (Table 5.1-1). Conversely, 4 fish (9%) were never detected within the reservoir inundation zone or ZHI during the foraging season. Thirty-nine of 44 Burbot (89%) were detected within the reservoir inundation zone or ZHI on more than half of the aerial surveys in which they were detected during the foraging season.

During the overwintering period, Burbot upstream of Devils Canyon were dispersed throughout mainstem, 89% of detections were within the inundation zone/ZHI (Figure 5.2-3; Figure 5.2-4). Burbot were detected upstream of the inundation zone in the Susitna River and the lower Tyone River, accounting for around 11 percent of all Burbot detections during the overwinter period. The reservoir inundation zone, including the Susitna River as well as Watana and Kosina creeks, accounted for 77 percent of detections during the overwintering period. No Burbot were detected upstream of the reservoir inundation zone in tributaries that would be partially inundated by the reservoir during the overwintering period (Figure 5.2-3). Thirty of 35 Burbot (86%) re-located on at least one aerial survey during the overwintering season were found within the reservoir inundation zone or ZHI on all surveys (Table 5.1-1). Conversely, 3 fish (9%) were never detected within the reservoir inundation zone or ZHI during the overwintering season. Thirty-one of 35 Burbot (89%) were detected within the reservoir inundation zone or ZHI on more than half of the aerial surveys in which they were detected during the overwintering season.

During the spawning period, Burbot upstream of Devils Canyon were dispersed throughout the mainstem; 86% of detections were within the inundation zone/ZHI (Figure 5.2-5; Figure 5.2-6). No Burbot were detected in tributaries during the spawning season; however, Burbot were detected upstream of the inundation zone in the Susitna River, accounting for around 14 percent of all Burbot detections during the spawning period. The reservoir inundation zone portion of Susitna River accounted for 75 percent of detections during the spawning period. No Burbot were detected upstream of the reservoir inundation zone in tributaries that would be partially inundated by the reservoir during the spawning period (Figure 5.2-5). Twenty-two of 26 Burbot (85%) re-located on at least one aerial survey during the spawning season were found within the reservoir inundation zone or ZHI on all surveys (Table 5.1-1). Conversely, 3 fish (11%) were never detected within the reservoir inundation zone or ZHI during the spawning season.

5.2.2. Middle River downstream of Devils Canyon and Lower River

5.2.2.1. Tagging

In 2013, a total of 9 Burbot were radio tagged in the Middle River downstream of Devils Canyon. Three Burbot were captured and tagged just upstream of the Yentna River (PRM 33.9), two fish were tagged at the mouth of Montana Creek (PRM 80.9), two fish were tagged at PRM 107, one fish at Curry (PRM 124.2), and one fish 1.9 river miles up Fish Creek (PRM 34.1). Tagging occurred pre-spawning during the Burbot foraging season in June (2), August (5), and September (2) 2013.

5.2.2.2. Tag Detection Summary

Burbot downstream of Devils Canyon with one or more live detections following the release day (n=9) were tracked for 4 to 445 days with a median of 35 days (Table 5.1-1). The tracking history for the Burbot tracked for 445 days (Fish 9245) and traveled 38.8 river miles is provided as Figure 5.2-11. The number of live detections (pings) received by individual tags ranged from 7 to 4,466 with a median of 23. Two Burbot (22%) tagged downstream of Devils Canyon were detected at fixed stations, both fish were only detected at one fixed station. All nine tagged fish (100%) were located on aerial surveys. The number of aerial surveys in which tags were detected ranged from 1 to 18 with a median of 2 surveys. Burbot with active tags were monitored in the study area downstream of Devils Canyon over an 11-month period (June 2013 to April 2014). The number of tags detected each month ranged from 1 in March and April 2013 to 7 in August and September 2013 (Table 4.2-3). One of the three Burbot (33%) tagged in the Middle River downstream of Devils Canyon was detected in the Lower River downstream of the Three Rivers Confluence (PRM 102.4).

All 9 Burbot were detected alive on one or more occasions during the foraging season (Table 5.1-1). Two Burbot (22%) tagged downstream of Devils Canyon were detected at fixed stations during foraging, both fish were only detected at one fixed station. All nine tagged fish (100%) were located on aerial surveys during the foraging season. The number of aerial surveys in which tags were detected ranged from 1 to 13 with a median of 2 surveys. The locations of Burbot released downstream of Devils Canyon during the foraging season are depicted in Figures 5.2-2 and 5.2-10.

Two of 9 Burbot (22%) tagged downstream of Devils Canyon were detected alive on one or more occasions during the overwintering season (Table 5.1-1). No Burbot were detected at fixed stations during overwintering. Both fish were located on aerial surveys; the number of aerial surveys in which tags were detected ranged from 5 to 9 with a median of 7 surveys. The locations of Burbot released downstream of Devils Canyon during the overwintering season are depicted in Figure 5.2-4.

Two of 9 Burbot (22%) tagged in the Middle River downstream of Devils Canyon were detected alive on one or more occasions during the spawning season (Table 5.1-1). No Burbot were detected at fixed stations during spawning. Both fish were located on two aerial surveys. The locations of Burbot released downstream of Devils Canyon during the overwintering season are depicted in Figure 5.2-6.

5.2.2.3. Direction, Extent, and Home Range

Total distance traveled for Burbot downstream of Devils Canyon ranged from 0.3 to 38.8 river miles, the median distance was 2.6 river miles (Table 5.1-1). Linear home range span for fish tracked 60 days or more (n=3) ranged from 10.1 to 16.2 miles. The three individuals were dispersed between PRM 80 and 117 and home ranges had little overlap. The median home range for the three fish downstream of Devils Canyon (12.6 miles) was nearly four times larger than Burbot home range upstream of Devils Canyon (3.3 miles); however, the sample size for the downstream tag group was small.

Because sample sizes were small, less than 10 active tags, seasonal analysis is limited. During foraging season, seven Burbot exhibited limited movements of 0.3-3.6 miles while two fish moved 13-16 miles. Most fish were dispersed throughout the mainstem near tagging locations from PRM 33 to 124.2. Three fish entered the lower reaches of the Talkeetna, Chulitna or Yentna rivers. During the overwintering season, the two individuals monitored made substantial movements of around 12 miles each and occupied reaches just upstream and downstream of the Three Rivers Confluence (PRM 102.4). During the spawning period the two individuals monitored moved 2-3 miles and were somewhat associated with the mainstem confluence areas near Montana and Lane creeks. The direction of movement was variable, most downstream movements occurred in April and May (8.5 and 3.4 river miles, n=1) and September-October (1.3 and 1.2 river miles, n=7 and n=3). The largest upstream movements occurred just prior to spawning in December (average 4.6 river miles, n=2) and January (average 3.9 river miles, n=2).

5.2.2.4. Movements Past Watana Dam and Devils Canyon

No Burbot tagged downstream of Devils Canyon exhibited an upstream movement past Impediment 1 (PRM 155.1), Impediment 3 (PRM 164.7), or the proposed Watana Dam location (PRM 187.1).

5.2.2.5. Habitat Use

Eight Burbot (89%) utilized the mainstem Susitna River downstream of Devils Canyon during the monitoring period. The mainstem Susitna River was used during all seasons and exclusively during the overwintering and spawning seasons. Three of nine Burbot (33%) entered one tributary stream during the monitoring period. Tributaries were used only during the foraging season (Figure 5.2-2). Two fish utilized one tributary and 1 fish two tributaries. Tributaries used downstream of Devils Canyon: Fish Creek and Yentna River (1 fish), Talkeetna River (1 fish) and Chulitna River (1 fish). Of the three fish that entered tributaries, 1 (33%) utilized only the lower three-tenths of a mile (TRM 0.0-0.3), and other two (66%) were detected in the lower two miles (TRM 0.0-2.0).

Among habitat types, eight Burbot (89%) were detected in mainstem non-confluence areas, 5 (56%) were detected in confluence areas, and 2 (22%) were detected in tributary non-confluence areas. Mainstem non-confluence, confluence, and tributary non-confluence accounted for 68%, 26%, and 6% of all fish positions downstream of Devils Canyon from aerial surveys, respectively.

Burbot tagged downstream of Devils Canyon did not utilize habitat types more or less than predicted based on availability, selection ratios all overlapped with 1. The selection ratios for

mainstem, confluence, and tributary habitats were 1.1±0.8, 2.1±2.1, and 1.1±3.2, respectively (Table 5.1-1; Figure 5.2-12). Habitat use in the Middle River downstream of Devils Canyon was dissimilar to upstream from Devils Canyon where fish exhibited selection for or against each habitat type; this is likely due to the small number of tagged fish and generally short tracking durations downstream of Devils Canyon. Seasonal selection ratios are presented in Table 5.1-1; however, samples sizes from the initial year of tagging were not sufficient to do biologically meaningful seasonal comparisons of habitat use.

5.2.2.6. Use of Zone of Hydrologic Influence

Three of the nine Burbot (33%) re-located on at least one aerial survey were found within the ZHI on all surveys. Five fish (56%) never moved upstream of PRM 80, the downstream end of preliminary geomorphic mapping of the ZHI. Four of nine Burbot (44%) were detected within the ZHI on more than half of the aerial surveys in which they were detected. No Burbot were detected outside of the ZHI in the Middle River upstream from the Three Rivers Confluence. Samples sizes were not sufficient to do seasonal comparisons of use of the ZHI for Burbot downstream of Devils Canyon.

5.3. Dolly Varden

5.3.1. Upper River and Middle River Upstream of Devils Canyon

5.3.1.1. Tagging

No Dolly Varden were radio tagged in the Upper Susitna River or Middle Susitna River upstream of Devils Canyon. Fish distribution and abundance data from 2013 and 2014 indicate that Dolly Varden of the appropriate minimum size for radio tagging were rare upstream of Devils Canyon.

5.3.2. Middle River downstream of Devils Canyon and Lower River

5.3.2.1. Tagging

In 2013, a total of nine Dolly Varden were radio tagged in the Middle River downstream of Devils Canyon. Six Dolly Varden (67%) were captured and tagged on the Talkeetna River (RM 5.9-6.3) near the Chunilna (Clear) Creek confluence, two fish were tagged at Curry (PRM 124.2), and one fish was tagged at the clearwater plume of Indian River (PRM 142.0). Tagging occurred pre-spawning during the Dolly Varden foraging season in June (1), July (6), and August (2), 2013.

5.3.2.2. Tag Detection Summary

Dolly Varden tagged downstream of Devils Canyon with one or more live detections following the release day (n=9) were tracked for 1 to 370 days with a median 13.8 days (Table 5.1-1). The number of live detections (pings) received by individual tags ranged from 2 to 2,326 with a median of 60. Four Dolly Varden (44%) tagged downstream of Devils Canyon were detected at fixed stations; the number of fixed stations each fish was detected by ranged from 1 to 3, with three fish only detected at one fixed station. All nine tagged fish (100%) were located on aerial surveys. The number of aerial surveys in which tags were detected ranged from 1 to 14 with a median of 4 surveys. Dolly Varden with active tags were monitored in the study area downstream of Devils

Canyon over a 14-month period (June 2013 to July 2014). The number of tags detected each month ranged from 1 (June 2013, October 2013, and July, 2014) to 7 in July, 2013 (Table 4.2-3). Two of the nine Dolly Varden (20%) tagged in the Talkeetna River were detected in the Lower River downstream of the Three Rivers Confluence (PRM 102.4).

All 9 Dolly Varden were detected alive on one or more occasions during the foraging season (Table 5.1-1). Four Dolly Varden (44%) tagged downstream of Devils Canyon were detected at fixed stations during foraging; the number of fixed stations ranged from 1 to 3 with 3 fish only detected at one fixed station. All 9 Dolly Varden (100%) were located on aerial surveys during the foraging season. The number of aerial surveys in which tags were detected ranged from 1 to 9 with a median of 3 surveys. The locations of Dolly Varden released in the Middle and Lower River downstream of Devils Canyon during the foraging season is depicted in Figure 5.3-1.

Two of nine Dolly Varden (22%) were detected alive on one or more occasions during the spawning season (Table 5.1-1). No Dolly Varden tagged downstream of Devils Canyon were detected at fixed stations during the spawning season. Two tagged fish (22%) were located on aerial surveys during the spawning season; the number of aerial surveys in which tags were detected was 1. The locations of Dolly Varden released in the Middle River and Lower River downstream of Devils Canyon during the spawning season are depicted in Figure 5.3-2.

Three of nine Dolly Varden (33%) tagged in the Middle River downstream of Devils Canyon were detected alive on one or more occasions during the overwintering season (Table 5.1-1). No Dolly Varden tagged downstream of Devils Canyon were detected at fixed stations during the winter; however, three tagged fish (33%) were located on aerial surveys. The number of aerial surveys in which tags were detected ranged from 1 to 6 with a median of 6 surveys. The locations of Dolly Varden released in the Middle River and Lower River downstream of Devils Canyon during the overwintering season are depicted in Figure 5.3-3.

Because of small number of fish detected during the overwintering and spawning periods, seasonal comparisons are limited.

5.3.2.3. Direction, Extent, and Home Range

Total distance traveled for Dolly Varden with one or more detections following release (n=9) ranged from 0.1 to 71.4 river miles, the median distance was 19.1 river miles (Table 5.1-1). Linear home range span for fish tracked 60 days or more (n=4) ranged from 6.7 to 46.4, with a median of 23.4.

The majority of Dolly Varden utilized a 10-20 mile long reach of the mainstem Susitna River and the lower 6-10 miles of tributary streams during the monitoring period. Dolly Varden migrated to foraging tributaries during the summer and remained at these tributaries through the foraging period. Some fish were detected during the spawning season near their foraging locations while other fish used different waterbodies for foraging and spawning. Overwintering occurred in the Susitna River and the lower reach of the Talkeetna River.

Tagged Dolly Varden exhibited seasonal movements in the mainstem that were directional in nature (Figure 5.3-4); pronounced upstream movements (median monthly distance >18 river miles) occurred early foraging season shortly after ice break-up (June, 2013). Dolly Varden were

mostly sedentary during the remainder of the foraging season; then as water temperatures cooled, discharge dropped, and turbidity decreased in late fall, fish moved from tributaries to the mainstem downstream to overwintering areas. Dolly Varden made downstream movements of 8-45 river miles (monthly) during the fall (November) before being somewhat sedentary during the winter (Figure 5.3-3).

Three tagged Dolly Varden detected during the overwintering period, resided in the Three Rivers Confluence area and in the lower Talkeetna River between the mouth and Chunilna River (RM 0.0-6.3; Figure 5.3-3). During the spawning period, the small sample size of Dolly Varden (n=2) from the first year of tagging did not allow for identification of spawning areas or indicate that fish were aggregating in particular locations (Figure 5.3-2). Individual fish were found to be associated with the confluence of Talkeetna River and Chunilna Rivers (PRM 142.1) and confluence of the Susitna River and Montana Creek (PRM 80.8). Some individuals made directed movements in the mainstem.

5.3.2.4. Movements Past Watana Dam and Devils Canyon

No Dolly Varden tagged downstream of Devils Canyon exhibited an upstream movement past Impediment 1 (PRM 155.1), Impediment 3 (PRM 164.7), or the proposed Watana Dam location (PRM 187.1).

5.3.2.5. Habitat Use

Five Dolly Varden (56%) utilized the mainstem Susitna River during the monitoring period. The mainstem accounted for 29% of all aerial survey detections. The mainstem Susitna River was used during all seasons (Figures 5.3-1 through 5.3-3). Seven of nine Dolly Varden (78%) entered one tributary stream during the monitoring period. Tributaries were used during all seasons (Figures 5.3-1 through 5.3-3). Six of nine fish utilized one tributary stream one fish utilized two tributaries. The most frequently used tributaries by fish tagged downstream of Devils Canyon were the Talkeetna River (6 fish), Indian River (1 fish), and Montana Creek (1 fish). The six fish that utilized the Talkeetna River were tagged within that drainage (Section 5.3.2.1). In addition to these tributaries, some individuals tagged in the Talkeetna River utilized the Chunilna (Clear) Creek, a tributary to the Talkeetna River. Of the seven fish that utilized tributaries, none exclusively utilized the lower two miles (TRM 0.0-2.0), and one fish (11%) was detected 10 or more miles upstream in the Talkeetna River drainage. Most fish used the lower 3.9 to 6.9 miles of tributary streams. Portage Creek, Indian River, and Montana Creek accounted for 54% 13%, 4% of all aerial survey detections, respectively.

Among habitat types, 4 Dolly Varden (44%) were detected in mainstem non-confluence areas, 3 (33%) were detected in confluence areas, and 7 (78%) were detected in tributary non-confluence areas. Mainstem non-confluence, confluence, and tributary non-confluence accounted for 25%, 8%, and 67% of all fish positions downstream of Devils Canyon from aerial surveys, respectively. Dolly Varden tagged downstream of Devils Canyon did not utilize any habitat type more than predicted based on availability. Average selection ratio was highest for tributary habitat, 3.0±2.9; however, sample sizes were small and confidence intervals overlapped with 1 (Table 5.1-1; Figure 5.3-5). Seasonal selection ratios are presented in Table 5.1-1; however, samples sizes were not sufficient to evaluate biologically meaningful seasonal comparisons of habitat use.

5.3.2.6. Use of Zone of Hydrologic Influence

Two of the nine Dolly Varden (22%) re-located on at least one aerial survey were found within the ZHI on all surveys. Conversely, 4 fish (44%); all tagged in the Talkeetna River were never detected within the ZHI. Four of nine Dolly Varden (44%) were detected within the ZHI on more than half of the aerial surveys in which they were detected. Tagged fish used tributary reaches upstream from the ZHI in the Talkeetna River in all seasons while Indian River was only used during the foraging season (Figures 5.3-1, 5.3-2, and 5.3-3). Thirty-one percent (16 of 52) of all Dolly Varden positions downstream of Devils Canyon from aerial surveys were within the ZHI. Samples sizes were not sufficient to do seasonal comparisons of use of the ZHI for Dolly Varden downstream of Devils Canyon.

5.4. Humpback Whitefish

5.4.1. Upper River and Middle River Upstream of Devils Canyon

5.4.1.1. Tagging

No Humpback Whitefish were radio tagged in the Upper Susitna River or Middle Susitna River upstream of Devils Canyon. Based on fish distribution and abundance, Humpback Whitefish are present in very low abundance upstream of Devils Canyon and were not collected during radio tagging efforts.

5.4.2. Middle River downstream of Devils Canyon and Lower River

5.4.2.1. Tagging

In 2013, a total of seven Humpback Whitefish were radio tagged in the Middle River downstream of Devils Canyon. Three Humpback Whitefish (43%) were captured and tagged in the Susitna River at Curry (PRM 124.2), two fish (29%) were tagged at PRM 107, and two fish were tagged at PRM 152.3 near the Portage Creek. Tagging occurred post-spawning during the Humpback Whitefish foraging season in June (3) and July (4), 2013.

5.4.2.2. Tag Detection Summary

Humpback Whitefish tagged in the Middle River downstream of Devils Canyon with one or more live detections following the release day (n=6) were tracked for 7 to 41 days with a median of 18 days (Table 5.1-1). Humpback Whitefish appeared to be sensitive to tagging, most Humpback Whitefish had short tag monitoring durations, were detected as mortalities within a month of tagging, and one of seven fish was not detected post-release. The number of live detections (pings) received by individual tags ranged from 23 to 1,035 with a median of 138. Five Humpback Whitefish (83%) tagged downstream of Devils Canyon were detected at fixed stations; the number of fixed stations ranged from 1 to 4 with 4 fish (67%) only detected at one fixed station. Six Humpback Whitefish (100%) were located on aerial surveys. The number of aerial surveys in which tags were detected ranged from 1 to 15 with a median of 3 surveys. Humpback Whitefish with active tags were monitored in the study area downstream of Devils Canyon over a 3-month period (June 2013 to August 2013). The number of tags detected each month ranged from 3 (June 2013) to 5 in July 2013 (Table 4.2-3). Three of the six Humpback Whitefish (50%) tagged in the

Middle River downstream of Devils Canyon were detected in the Lower River downstream of the Three Rivers Confluence (PRM 102.4).

Six Humpback Whitefish tagged in the Middle River downstream of Devils Canyon were detected alive on one or more occasions during the foraging season (Table 5.1-1). Yet, the foraging season was the only season in which Humpback Whitefish were monitored. The locations of Humpback Whitefish released in the Upper River and Middle River downstream of Devils Canyon during the foraging season are depicted in Figure 5.4-1. Clusters of detections occurred near Portage Creek, Curry, and Whiskers Creek. Because of small samples sizes and short tag monitoring durations, analysis is limited.

5.4.2.3. Direction, Extent, and Home Range

Total distance traveled for active tags with one or more detection following release (n=6) ranged from 4.2 to 59 river miles, the median distance was 33 river miles (Table 5.1-1). No Humpback Whitefish were tracked for 60 days or more, the minimum period established to evaluate linear home range span.

The majority of Humpback White fish utilized a 20-40 mile long reach of the mainstem Susitna River downstream of Devils Canyon during the foraging season. Tagged Humpback Whitefish exhibited seasonal movements in the mainstem that were directional in nature; nearly all fish made pronounced downstream movements (median monthly distance >15 river miles) following tagging during the foraging season (Figure 5.4-2). Because of the short monitoring period prior to mortality, it is not known whether these movements were biologically meaningful migrations or related to post-tagging stress.

5.4.2.4. Movements Past Watana Dam and Devils Canyon

No Humpback Whitefish (0%) tagged downstream of Devils Canyon exhibited an upstream movement past Impediment 1 (PRM 155.1), Impediment 3 (PRM 164.7), or the proposed Watana Dam location (PRM 187.1).

5.4.2.5. Habitat Use

Six Humpback Whitefish (100%) utilized the mainstem Susitna River during the foraging season (Figure 5.4-1). Two of six Humpback Whitefish (33%) entered one tributary stream during this time. No fish utilized more than one tributary. The two individuals used Whiskers Creek (PRM 105.1) and Rabideaux Creek (PRM 87.6) and were the only radio tagged fish detected in these tributaries. The two fish that entered tributaries both utilized the lower 0.7 river miles of the tributaries. Each fish was only detected in a tributary on a single survey each accounting for 3% all aerial survey detections during the foraging season.

Among habitat types, all six Humpback Whitefish were detected in mainstem non-confluence areas and confluence areas, two fish (33%) were detected in tributary non-confluence areas. Mainstem non-confluence, confluence, and tributary non-confluence accounted for 43%, 50%, and 7% of all fish positions downstream of Devils Canyon from aerial surveys, respectively. Humpback Whitefish tagged downstream of Devils Canyon utilized each habitat type as predicted based on availability during the foraging season (Figure 5.4-3). The average selection ratio for

confluence habitat was high, 3.1; however, the confidence interval overlapped with 1 (indicating no selection), due to a small sample size and high variability.

5.4.2.6. Use of Zone of Hydrologic Influence

Five of the six Humpback Whitefish (83%) re-located on at least one aerial survey were found within the ZHI on all surveys. Conversely, 1 fish (17%) tagged at PRM 107 moved downstream into the Lower River and was never detected within the ZHI on aerial surveys. Tagged fish only used tributary reaches within the ZHI during the foraging season (Figure 5.4-1). Ninety-three percent (28 of 30) of all Arctic Graying positions downstream of Devils Canyon from aerial surveys were within the ZHI. Humpback Whitefish were only detected during the foraging season, seasonal comparisons of use of the ZHI could not be made.

5.5. Lake Trout

5.5.1. Upper River and Middle River Upstream of Devils Canyon

5.5.1.1. Tagging

In 2014 a total of twelve Lake Trout were radio tagged in the Upper Susitna River basin upstream of Devils Canyon. Eleven Lake Trout (92%) were captured and tagged in Tsisi Lake 1, located in the Tsisi sub-basin of Kosina Creek (PRM 209.1); one fish (8%) was tagged in Sally Lake in the Watana Creek basin (PRM 196.9). All tagging occurred during the spawning season, in September, 2014. A number of fish were in post-spawn condition in September but some had still not spawned.

5.5.1.2. Tag Detection Summary

Lake Trout tagged in the Upper River with one or more live detections following the release day (n=12) were tracked for 56 to 272 days with a median 272 days (Table 5.1-1). The number of live detections (pings) received by individual tags ranged from 14 to 160 with a median of 94. Lake Trout were not detected at fixed stations. All twelve tagged fish (100%) were located on aerial surveys. The number of aerial surveys in which tags were detected ranged from 2 to 10 with a median of 10 surveys. Lake Trout with active tags were monitored in the study area over a 10-month period (September 2014 to June 2015). The number of tags detected each month ranged from 10 (May and June 2015) to 12 in September 2015 (Table 4.2-3).

Eleven of twelve Lake Trout (92%) tagged in the Upper River were detected alive on one or more aerial surveys during the foraging season (Table 5.1-1). The number of aerial surveys in which tags were detected ranged from 1 to 2 with a median of 2 surveys. The locations of Lake Trout released in the Upper River and Middle River downstream of Devils Canyon during the foraging season is depicted in Figure 5.5-1.

Eleven of twelve Lake Trout (92%) tagged in the Upper River were detected alive on one or more aerial surveys during the spawning season (Table 5.1-1). The number of aerial surveys in which tags were detected ranged from 1 to 2 with a median of 2 surveys. The locations of Lake Trout released in the Upper River during the spawning season is depicted in Figure 5.5-2.

All twelve Lake Trout (100%) tagged in the Upper River were detected alive on one or more aerial surveys during the overwintering season (Table 5.1-1). The number of aerial surveys in which tags were detected ranged from 1 to 6 with a median of 6 surveys. The locations of Lake Trout released in the Upper River during the overwintering season is depicted in Figure 5.5-3.

5.5.1.3. Direction, Extent, and Home Range

Lake Trout exclusively utilized the lake in which they were tagged during the foraging, overwintering and spawning seasons (Figures 5.5-1, 5.5-2, and 5.5-3). Linear home range span for fish tracked 60 days or more (n=1) was limited to Sally Lake (63 acres/0.25 km^2/0.1 mi^2) and Tsisi Lake 1 (~55 acres/ 0.22 km^2, 0.09 mi^2). For active tags with one or more detection following release (n=12), total linear distance between detections ranged from 0.1 to 3 miles, the median distance was 2.1 miles (Table 5.1-1).

The tagged population of Lake Trout exhibited seasonal movements related to lake depths. During the foraging season (May-June) many individuals utilized the littoral zone in the lake inlet area of Tsisi Lake 1 and shallow littoral edges of Sally Lake. As water temperatures cooled during the fall spawning season fish utilized shallow areas in and near the lake outlets. During the winter when lakes were iced-over fish were located in the deepest sections in the middle of the lakes. The seasonal pattern was consistent between lakes. Besides a seasonal pattern within the lake waterbodies, Lake Trout did not emigrate from lakes to make extensive foraging or spawning migrations and no migratory corridors were observed.

5.5.1.4. Movements Past Watana Dam and Devils Canyon

No Lake Trout tagged in the Upper River exhibited movements outside of the lake they were tagged in, no fish moved downstream past the proposed Watana Dam location (PRM 187.1), Impediment 3 (PRM 164.7), or Impediment 1 (PRM 155.1).

5.5.1.5. Habitat Use

Lake Trout exclusively used lake habitat and lake outlet streams in close proximity to lakes during all seasons (n=12 fish, 106 aerial detections). No tagged Lake Trout were observed emigrating from lakes into tributaries, the mainstem Susitna River, or confluence areas. Habitat selection ratios for, mainstem, confluence and tributary were 0 (Table 5.1-1). Lake Trout were the only radio tagged species to utilize lake habitat, and the only species that did not use the mainstem Susitna River on at least a seasonal basis. Lake Trout did exhibit some seasonal patterns utilizing various depths and zones in certain seasons.

5.5.1.6. Use of Reservoir Inundations/Zone of Hydrologic Influence

One of the twelve Lake Trout (8%) re-located on at least one aerial survey was found within the ZHI on all surveys (Table 5.1-1). This individual inhabited and never emigrated from Sally Lake, the only lake of any significant size within the reservoir inundation zone. Conversely, the 11 fish (92%) tagged in Tsisi Lake 1, never left the lake and were never detected within the reservoir inundation zone on any aerial surveys. Fish remained in the lakes in which they were tagged during all seasons (Figures 5.5-1, 5.5-2, and 5.5-3).

5.5.2. Middle River downstream of Devils Canyon and Lower River

5.5.2.1. Tagging

No Lake Trout were radio tagged in the Middle Susitna River downstream of Devils Canyon. The distribution of Lake Trout is limited to the Upper River.

5.6. Longnose Sucker

5.6.1. Upper River and Middle River Upstream of Devils Canyon

5.6.1.1. Tagging

In 2013 and 2014, a total of 44 Longnose Sucker were radio tagged upstream of Devils Canyon. Fish were tagged and released between PRM 192.7 and the Tyone River (PRM 247.3). Tags were generally distributed throughout the Upper River study area (Table 5.1-1). The primary tagging locations in the Upper River were: Watana Creek (PRM 196.9) near the mouth (8 fish), Susitna River at PRM 198.9 (5 fish), Susitna River at PRM 206.7 (8 fish), Susitna River near the mouth of the Tyone River (PRM 247.3, 10 fish), and 0.4 river miles upstream in the Tyone River (5 fish). Tagging occurred post-spawning during the Longnose Sucker foraging season in, July 2013 (5 fish), September 2013 (5), June 2014 (17) and September 2014 (17).

5.6.1.2. Tag Detection Summary

Longnose Sucker with one or more live detections following the release day (n=39) were tracked for 4 to 518 days with a median 72 days (Table 5.1-1). Five tagged Longnose Sucker were either not detected or were determined to be mortalities on the first detection. The number of live detections received by individual tags ranged of 7 to 84,383 with a median of 258. Twenty-eight Longnose Sucker (72%) tagged upstream from Devils Canyon were detected at fixed stations. The number of fixed stations ranged from one to six with a median of one station. Thirty-seven Longnose Sucker (95%) were detected on aerial surveys. The number of aerial surveys in which tags were detected ranged from 1 to 35 with a median of 9 surveys. Longnose Sucker were monitored in the study area upstream of Devils Canyon over a 23-month period (August 2013 to June 2015). The number of tags detected each month released upstream of Devils Canyon ranged from a low of 3 in May 2014 to a high of 28 in September 2014 (Table 4.2-3).

Thirty-nine Longnose Sucker (100%) were detected alive on one or more occasions during the foraging season (Table 5.1-1). Twenty-seven Longnose Sucker (69%) were detected at fixed stations during foraging, the number of fixed stations never range from one to six. Thirty-six tagged fish (92%) were located on aerial surveys. The number of aerial surveys in which tags were detected ranged from 1 to 17 with a median of 6 surveys. The locations of Longnose Sucker released in the Upper River and Middle River upstream of Devils Canyon during the foraging season are depicted in Figures 5.6-1 and 5.6-2.

Twenty-four Longnose Sucker (62%) were detected alive on one or more occasions during the overwintering season (Table 5.1-1). Seven Longnose Sucker (20%) were detected at fixed stations during the winter, the number of fixed stations ranged from 1 to 2. Twenty-four tagged fish (62%) were located on aerial surveys. The number of aerial surveys in which tags were detected ranged

from 1 to 16 with a median of 3 surveys. The locations of Longnose Sucker released in the Upper River and Middle River upstream of Devils Canyon during the overwintering season is depicted in Figure 5.6-3.

Twenty-four Longnose Sucker (62%) were detected alive on one or more occasions during the spawning season (Table 5.1-1). Ten Longnose (26%) tagged upstream from Devils Canyon were detected at fixed stations during the spawning season, the number of stations ranged from 1 to 4. Nineteen Longnose Sucker (49%) were located on aerial surveys. The number of aerial surveys in which tags were detected ranged from 1 to 2 with a median of 1 survey. The locations of Longnose Sucker released in the Upper River and Middle River upstream of Devils Canyon during the spawning season is depicted in Figure 5.6-4.

5.6.1.3. Direction, Extent, and Home Range

Overall the total distance traveled by Longnose Sucker ranged from 0.5 to 190.8 river miles, the median distance was 24.3 river miles (Table 5.1-1). Linear home range span for fish tracked 60 days or more (n=26) ranged from 1.6 to 104.1 miles with a median distance of 12 miles.

Total distance traveled during the foraging season was similar to overall and ranged from 0.1 to 190.8 river miles, the median distance was 15.7 river miles. Linear home range span during the foraging season for fish tracked 60 days or more (n=24) ranged from 0.1 to 104 miles with a median distance of 5.3 miles.

Longnose Sucker behavior was largely consistent across seasons with fish primarily located in the Upper River between Jay Creek and Deadman Creek. Fish used tributaries during the foraging period, but not during the overwintering period. Extent of movement and home range were similar between foraging and overwintering seasons. The total distance traveled during the overwintering season for active tags with one or more detection following release ranged from 0.6 to 24 river miles, the median distance was 3.7 river miles. Linear home range span during the overwintering season for fish tracked 60 days or more (n=20) ranged from 0.2 to 24 miles with a median distance of 2.5 miles. Most Longnose Sucker detections (55 percent) during the overwinter period were between PRM 203 to the Watana Dam Site (Figure 5.6-3). Other groups of fish overwintered in the mainstem near the Tyone River (18 percent of detections) and Kosina Creek (10 percent of detections).

Total distance traveled during the six-week-long Longnose Sucker spawning season (May 1 to June 15) ranged from 0.1 to 66.8 river miles, the median distance was 1 river mile. Most individuals did not appear to make a substantial movement or migration for spawning and remained in the vicinity of overwintering locations. Linear home range span during the spawning season for fish tracked 60 days or more (n=15) was similar to distance traveled during this short season, and ranged from 0.1 to 12.9 miles with a median distance of 1 mile. Longnose Sucker were primarily detected in the Upper River from Jay Creek downstream to near Watana Creek during the spawning period (83 percent of detections; Figure 5.6-4). Upstream from the Inundation Zone, Longnose Sucker were observed in the Tyone and Oshetna rivers.

The majority of Longnose Sucker utilized a 5-15 mile long reach of the mainstem Susitna River and occasionally the lower reach of a tributary stream within that reach during the foraging,

overwintering and spawning seasons. Longnose Sucker in the Upper River were concentrated from Jay Creek downstream to Deadman Creek. During the summer, Longnose Sucker maintained a home range in the mainstem of the Susitna River and some tributaries including Watana Creek and the Oshetna and Tyone rivers. After foraging, fish migrated to their overwintering locations. Overwintering locations were located upstream and downstream of foraging locations. The distance between foraging and overwintering locations ranged from less than a mile to over 15 miles. During the winter, fish were primarily in the Susitna River and typically did not move extensively. In the spring fish returned to foraging areas. Fish that traveled downstream long distances died soon after.

Figure 5.6-5 is an example tracking history for a Longnose Sucker tracked over 411 days that utilized a 14.7-mile segment of the Susitna River with most activity between Kosina and Jay creeks. The tagged population of Longnose Sucker did not appear to make seasonally coordinated movements in the mainstem Susitna River that were directional in nature (Figure 5.6-6). These movements were sporadic and did not appear to follow a directional pattern and all median net monthly movements were less than 1.05 miles. Movements were generally limited during the overwinter period and increased from May through October. At the beginning of the overwintering period (October and November, during freeze-up) a downstream median movement of approximately 1 mile was observed prior to fish being mostly sedentary during the winter (Figure 5.6-6).

Longnose Sucker did not appear to aggregate during any season. During the foraging season, eighteen Longnose Sucker (46%) utilized portions of the seventeen-mile segment of the mainstem from PRM 190-207, and seven fish (18%) utilized the twelve-mile segment of the mainstem between the Oshetna and Tyone rivers PRM 253.2-247.3. The Middle River between Impediment 3 and the proposed dam site as well as the Upper River between PRM 213 to 235 were rarely used by Longnose Sucker. Five Longnose Sucker (13%) utilized the lower reaches of Watana Creek (RM 0-0.5) and the Tyone River (RM 0.0-0.4) during the foraging season (Figure 5.6-1). During the spawning season, most Longnose Sucker (67%) utilized small portions of the mainstem between PRM 195 and 207; fish were spread evenly along this section (Figure 5.6-3). Six fish (25%) utilized lower Watana Creek (RM 0.0-0.1) during the spawning season. During overwintering, tagged fish were concentrated in the mainstem between PRM 192 and 201 (Figure 5.6-4). This section of river was also heavily utilized by other species for overwintering, notably Burbot and Arctic Grayling.

Longnose Sucker rarely used or migrated through an eighteen-mile stretch of Upper Susitna River (PRM 214-232) from near Goose Creek (PRM 232.8) to just upstream of Jay Creek (PRM 211). Longnose Sucker were rarely detected in this stretch of river (n=3 fish), accounting for only 1.7% of all aerial detections. The tracking history of Longnose Sucker tagged upstream (n=15) and downstream (n=29) of this stretch of river suggests that there may be little interaction between groups. Only two fish (Tags 9122 and 9510) exhibited a movement through Watana Canyon (PRM 225-226.5); that movement was downstream in direction.

5.6.1.4. Movements Past Watana Dam Site and Devils Canyon

Twelve of 39 Longnose Sucker (31%) tagged upstream of Devils Canyon exhibited a movement past the proposed Watana Dam location (PRM 187.1). All twelve individuals exhibited a

downstream movement past the proposed dam site; no fish moved only upstream direction (Table 5.1-1). The number of movements past the dam site was variable by season, with most occurring during the foraging season (8 fish), followed by the overwintering (3 fish) and spawning seasons (1 fish; Table 5.1-2). Movements downstream past the dame site occurred in June (2) and July (5) September (2), October (1), and November (2).

Nine Longnose Sucker (23%) exhibited a downstream movement past Impediments 3 (PRM 164.7) one fish was detected as a mortality and eight fish were detected alive. Most of these fish then continued downstream and were detected alive downstream of Impediment 1 (PRM 160.5); one fish was detected as a mortality. All downstream movements of live tags through Devils Canyon occurred during the foraging season in late June (2), July (4), and August (1). No Longnose Sucker were observed passing upstream past Impediment 1 or Impediment 3 in Devils Canyon.

5.6.1.5. Habitat Use

All thirty-nine Longnose Sucker (100%) with one or more live detections utilized the mainstem Susitna River during the monitoring period. Eighteen of 39 Longnose Sucker (46%) entered one tributary. No fish utilized two or more tributaries. The most frequently used tributaries by fish tagged upstream from Devils Canyon were: Watana Creek (10 fish), Tyone River (6 fish), Jay Creek (1 fish), and the Oshetna River (1 fish). In 2014, Watana Creek was the only Upper River tributary wherein Longnose Sucker were detected (Table 5.1-2); however, in 2015, Longnose Sucker were detected in Watana and Jay creeks and the Oshetna and Tyone rivers. Of the 18 fish that entered tributaries, 11 (61%) utilized only the lower three-tenths of a mile (TRM 0.0-0.3). One fish (6%) was detected more than 2 miles upstream in the Oshetna River; no fish moved more than 4.6 miles up a tributary. Among habitat types, 36 Longnose Sucker (92%) were detected in mainstem non-confluence areas, 36 (92%) were detected in confluence areas, and 9 (24%) were detected in tributary non-confluence areas. Respectively, mainstem non-confluence, confluence, and tributary non-confluence accounted for 75%, 23%, and 2% of all fish positions upstream from Devils Canyon from aerial surveys.

Longnose Sucker tagged upstream of Devils Canyon utilized mainstem and tributary confluence habitat significantly more than predicted based on availability and tributary habitat significantly less than predicted based on availability (Table 5.1-3; Figure 5.6-7). In particular, the selection ratio for confluence habitat was very high 3.5±1.7 and tributary habitat was very low, 0.1±0.1 indicating strong habitat selection by Longnose Sucker (Figure 5.6-7).

All 39 Longnose Sucker (100%) utilized the mainstem Susitna River during the foraging period. Eleven fish (23%) entered one tributary stream during the foraging period (Tables 5.1-1 and 5.1-4). No fish utilized two or more tributaries. The most frequently used tributaries by fish tagged upstream from Devils Canyon were: Watana Creek (5 fish), Tyone River (5 fish), and the Oshetna River (1 fish). Of the 11 fish that entered tributaries, 5 (45%) utilized only the lower three-tenths of a mile (TRM 0.0-0.3). Only 1 fish was detected more than 2 miles upstream in a tributary during the foraging period. Among habitat types, 31 Longnose Sucker 80%) were detected in mainstem non-confluence areas, 32 (83%) were detected in confluence areas, and 6 (15%) were detected in tributary non-confluence areas. Respectively, mainstem non-confluence, confluence,

and tributary non-confluence accounted for 74%, 25%, and 1% of all fish positions upstream from Devils Canyon from aerial surveys.

During the foraging season, Longnose Sucker tagged upstream of Devils Canyon utilized tributary confluence habitat significantly more than predicted based on availability and tributary habitat significantly less than predicted based on availability (Table 5.1-3; Figure 5.6-7). Mainstem, non-confluence areas were used as predicted based on availability, the mean selection ratio was 1.2±0.3.

During the overwintering season, 24 Longnose Sucker (100%) used the mainstem Susitna River. Compared to the foraging season, the proportion of fish utilizing a tributary decreased during winter, 4 of 24 Longnose Sucker (17%) entered one tributary stream during the overwintering period (Tables 5.1-1 and 5.1-4). No fish utilized two or more tributaries. The most frequently used tributaries by fish tagged upstream from Devils Canyon were: Watana Creek (2 fish), Tyone River (1 fish), and Jay Creek (1 fish). All four fish that entered tributaries utilized only the lower three-tenths of a mile (TRM 0.0-0.3). Among habitat types, 24 Longnose Sucker (100%) were detected in mainstem non-confluence areas, 12 (50%) were detected in confluence areas, and 0 (0%) were detected in tributary non-confluence areas. Mainstem non-confluence, confluence, and tributary non-confluence accounted for 81%, 19%, and 0% of all fish positions upstream from Devils Canyon from aerial surveys, respectively.

During the overwintering season, Longnose Sucker tagged upstream of Devils Canyon utilized mainstem non-confluence habitat significantly more than predicted and tributary non-confluence habitat significantly less than predicted based on availability (Table 5.1-3; Figure 5.6-7). The mean selection ratios for mainstem, non-confluence and tributary, non-confluence were 1.4±0.3 and 0.0. In contrast to the foraging season, during the winter confluence habitat was not used differently than predicted based on availability, 2.6±2.1.

During the spawning season, 22 of 24 Longnose Sucker (92%) utilized the mainstem Susitna. Compared to the foraging and overwintering seasons the proportion of fish utilizing a tributary increased; nine Longnose Sucker (38%) entered tributary streams during the spawning period (Tables 5.1-1 and 5.1-4). Most fish utilized only the lower portions of a tributary; no fish (0%) utilized two or more tributaries. The most frequently used tributaries by fish tagged upstream from Devils Canyon were, Watana Creek (7 fish), Tyone River (1 fish), and Oshetna River (1 fish). Seven of nine fish utilized only the lower 0.3 miles of tributaries and only one fish was detected more than 2 miles up a tributary. Among habitat types, 16 Longnose Sucker (67%) were detected in mainstem non-confluence areas, 14 (58%) were detected in confluence areas, and 2 (8%) were detected in tributary non-confluence areas. During the spawning season, mainstem non-confluence, confluence, and tributary non-confluence accounted for 63%, 25%, and 12% of all fish positions upstream from Devils Canyon from aerial surveys, respectively.

During the spawning season, Longnose Sucker tagged upstream of Devils Canyon did not utilize mainstem, non-confluence or confluence habitat differently than predicted based on availability, the mean selection ratios were 1.3 and 1.5 respectively (Table 5.1-3). Consistent with foraging and overwintering seasons; even though a higher proportion of fish entered tributaries, habitat use was utilized significantly less than predicted based on availability during spawning, with a selection ratio of 0.3±0.5 (Figure 5.6-7).

5.6.1.6. Inundation Zone/ZHI Use

Longnose Sucker tagged upstream of Devils Canyon primarily utilized areas that would be within the reservoir inundation zone upstream of the proposed Watana Dam location and within the zone of hydrologic influence downstream. Thirty-one of the 37 Longnose Sucker (84%) re-located on at least one aerial survey were found within the reservoir inundation zone or ZHI on all surveys (Table 5.1-1). Conversely, 5 fish (13%) were never detected within the reservoir inundation zone or ZHI. Thirty-two of 37 Longnose Sucker (86%) were detected within the reservoir inundation zone or ZHI on more than half of the aerial surveys in which they were detected. Ninety-one percent (369 of 407) of all fish positions upstream from Devils Canyon from aerial surveys were within the inundation zone/ZHI. Upstream of the proposed Watana Dam location, 90% (335 of 371) of all fish positions from aerial surveys were within the inundation zone. Longnose Sucker detections outside of the inundation zone occurred in the Susitna, Oshetna and Tyone rivers upstream of the full pool elevation (PRM 232.5) of the proposed reservoir. No Longnose Sucker were detected upstream of the reservoir inundation zone in tributaries that would be partially inundated by the reservoir. In the reach between Impediment 3 (PRM 164.7) and the proposed dam site (PRM 187.1), all eight Longnose Sucker (100%) re-located on at least one aerial survey were found within the ZHI on all surveys.

Longnose Sucker use of the inundation zone/ZHI was consistent among seasons. Twenty-eight of 36 Longnose Sucker (78%) re-located on at least one aerial survey during the foraging season were found within the reservoir inundation zone or ZHI on all surveys (Table 5.1-1). Conversely, 6 fish (17%) were never detected within the reservoir inundation zone or ZHI during the foraging season. Thirty of 36 Longnose Sucker (83%) were detected within the reservoir inundation zone or ZHI on more than half of the aerial surveys in which they were detected during the foraging season. During the foraging period, fish upstream of Devils Canyon were dispersed throughout mainstem, 97% of aerial detections were within the inundation zone/ZHI with some detection clusters near tributary mouths (Figures 5.6-1 and 5.6-2). Longnose Sucker were detected upstream of the inundation zone in the Susitna River and the lower Oshetna and Tyone Rivers, accounting for around 3 percent of all aerial detections during the foraging period.

Twenty of 24 Longnose Sucker (83%) re-located on at least one aerial survey during the overwintering season were found within the reservoir inundation zone or ZHI on all surveys (Table 5.1-1). Conversely, 4 fish (17%) were never detected within the reservoir inundation zone or ZHI during the overwintering season. During the overwintering period, fish upstream of Devils Canyon were dispersed throughout mainstem, 80% of aerial detections were within the inundation zone/ZHI with some detection clusters near Watana Creek (Figure 5.6-3). The four Longnose Sucker detected upstream of the inundation zone in the Susitna River and the lower Tyone River, accounted for approximately 20 percent of all aerial detections during the overwintering period.

Seventeen of 19 Longnose Sucker (90%) re-located on at least one aerial survey during the spawning season were found within the reservoir inundation zone or ZHI on all surveys (Table 5.1-1). Conversely, 2 fish (10%) were never detected within the reservoir inundation zone or ZHI during the spawning season. During the spawning period, fish upstream of Devils Canyon were dispersed throughout mainstem, 83% of aerial detections were within the inundation zone/ZHI with some detection clusters near Watana Creek (Figure 5.6-4). The two Longnose Sucker

detected upstream of the inundation zone in the Susitna River and the lower Oshetna and Tyone Rivers, accounted for approximately 17 percent of all aerial detections during the spawning period.

5.6.2. Middle River downstream of Devils Canyon and Lower River

5.6.2.1. Tagging

In 2013, 28 Longnose Sucker were radio tagged downstream of Devils Canyon. Fish were tagged and released between the Talkeetna River (PRM 100.5) and the confluence with Indian River (PRM 142.3). Tags were generally distributed throughout the Middle River study area (Table 5.1-1). The primary tagging locations were: the Talkeetna Station rotary screw trap (PRM 107; nine fish), the rotary screw trap at Curry Station (PRM 124.2; 5 fish), and near the confluence of Indiana River (PRM 142-142.3; seven fish). Tagging occurred post-spawning during the Longnose Sucker foraging season in late June (13 fish), July (8 fish), August (6 fish), and September (1 fish) 2013.

5.6.2.2. Tag Detection Summary

All but one of the tagged Longnose Sucker had one or more live detections following the release day (n=27) and were tracked for 4 to 436 days with a median 15 days (Table 5.1-1). One tagged Longnose Sucker was determined to be a mortality at the time of its first detection. The number of live detections received from individual tags ranged from 5 to 15,305 with a median of 130. Twenty Longnose Sucker (74%) tagged downstream of Devils Canyon were detected at fixed stations. The number of fixed stations ranged from one to three with a median of one station. Twenty-five Longnose Sucker (93%) were detected on aerial surveys. The number of aerial surveys in which tags were detected ranged from 1 to 56 with a median of 4 surveys. Longnose Sucker with active tags were monitored in the study area upstream of Devils Canyon over a 15-month period (June 2013 to August 2014). The number of tags detected each month ranged from a low of 1 to a high of 21 in July 2013 (Table 4.2-3).

Twenty-seven Longnose Sucker (100%) were detected alive on one or more occasions during the foraging season (Table 5.1-1). Twenty Longnose Sucker (69%) were detected at fixed stations during the foraging period, the number of fixed stations never range from one to 3. Twenty-five tagged fish (93%) were located on aerial surveys. The number of aerial surveys in which tags were detected during the foraging period ranged from 1 to 46 with a median of 4 surveys. The locations of Longnose Sucker released in the Upper River and Middle River upstream of Devils Canyon during the foraging season are depicted in Figures 5.6-2 and 5.6-8.

Five Longnose Sucker (19%) were detected alive on one or more occasions during the overwintering season (Table 5.1-1). Two of those (7%) were detected at one fixed station during the winter. All five were located on aerial surveys. The number of aerial surveys in which tags were detected ranged from 2 to 8 with a median of 4 surveys. The locations of Longnose Sucker released in the Lower River and Middle River downstream of Devils Canyon during the overwintering season is depicted in Figure 5.6-9.

One Longnose Sucker (4%) was detected alive on one or more occasions during the spawning season (Table 5.1-1). The tagged individual was not detected at fixed stations and was detected on two aerial surveys. The locations of the individual during the spawning season is depicted in Figure 5.6-10.

5.6.2.3. Direction, Extent, and Home Range

Total distance traveled for Longnose Sucker with active tags ranged from 0.6 to 82.1 river miles, the median distance was 11.9 river miles (Table 5.1-1). Linear home range span for fish tracked 60 days or more (n=7) ranged from 2.7 to 23.5 miles with a median distance of 14.5 miles.

Total distance traveled during the foraging season ranged from 0.2 to 53.3 river miles, the median distance was 6.9 river miles. Linear home range span during the foraging season for fish tracked 60 days or more (n=7) ranged from 1.4 to 32.5 miles with a median distance of 13.1 miles.

Extent of movement and home range decreased from foraging to the overwintering season for many Longnose Sucker. The total distance traveled during the overwintering season ranged from 1.6 to 23.2 river miles, the median distance was 3.7 river miles. Linear home range span during the overwintering season for fish tracked 60 days or more (n=5) ranged from 1.6 to 23 miles with a median distance of 2.6 miles. Longnose Sucker were detected overwintering in the Middle River from Indian River downstream to the Chulitna River (Figure 5.6-9). One fish overwintered in the Chulitna River and was the only Longnose Sucker to spend any of the overwintering period in a tributary. The total distance traveled and home range during the six-week-long Longnose Sucker spawning season (May 1 to June 15) for the one active tag was 0.4 miles.

Similar to upstream of Devils Canyon, the majority of Longnose Sucker downstream of the Canyon utilized a 5-15 mile long reach of the mainstem Susitna River and occasionally the lower reach a tributary stream during the foraging, overwintering and spawning seasons. Longnose Sucker in the Middle River downstream of Devils Canyon and Lower River were typically detected in the Middle River upstream to Portage Creek (92 percent of detections; Figure 5.6-11). Fish were less common from the Chulitna River downstream to the Parks Highway (3 percent of detections). Figure 5.6-11 is an example tracking history for a Longnose Sucker tracked over 436 days that utilized a 27-mile segment of the Susitna River between PRM 119 and 146. Sample sizes were not sufficient to determine if the tagged population of Longnose Sucker made seasonal movements in the mainstem Susitna River that were directional in nature.

Although sample sizes were low in some seasons, Longnose Sucker did not appear to aggregate during any season. During the foraging season, Longnose Sucker were dispersed throughout the Middle River mainstem with activity concentrations in the Curry Station/Deadhorse Creek Area (PRM 124) and Indiana River confluence (Figure 5.6-8). During the overwinter season, the few fish with active tags were widely distributed with individuals utilizing the Chulitna/Susitna Confluence, 2-3 miles upstream of Lane Creek, and the Indian River confluence area. During the spawning season, the one tagged fish with an active tag was found in the same area where it overwintered, 2-3 miles upstream of Lane Creek (Figure 5.6-9). Longnose Sucker rarely utilized or migrated through an approximately four-mile reach from PRM 109-112 and a twelve-mile stretch of Middle Susitna River between Jack Long Creek (PRM 148.3) and Impediment 1 (160.5; Figure 5.6-8).

5.6.2.4. Movements Past Watana Dam Site and Devils Canyon

No Longnose Sucker tagged downstream of Devils Canyon exhibited an upstream movement past Impediment 1 (PRM 155.1), Impediment 3 (PRM 164.7), or the proposed Watana Dam location (PRM 187.1).

5.6.2.5. Habitat Use

Twenty-five of 27 Longnose Sucker (93%) with one or more live detections utilized the mainstem Susitna River during the monitoring period. A lower proportion of Longnose Suckers entered tributary streams downstream of Devils Canyon as compared to fish tagged upstream of the Canyon. Six of 27 fish (22%) entered one tributary stream during the monitoring period. No fish utilized two or more tributaries. The most frequently used tributaries by fish tagged downstream of Devils Canyon were: Talkeetna River (4 fish), Indian River (1 fish), and Chulitna River (1 fish). Of the six fish that entered tributaries, 2 (33%) utilized only the lower three-tenths of a mile (TRM 0.0-0.3) and four were detected more than 2 miles upstream but no fish moved more than 5.9 miles up a tributary. Among habitat types, 24 Longnose Sucker (89%) were detected in mainstem non-confluence areas, 21 (78%) were detected in confluence areas, and 4 (15%) were detected in tributary non-confluence areas. Mainstem non-confluence, confluence, and tributary non-confluence accounted for 74%, 19%, and 7% of all fish positions downstream of Devils Canyon from aerial surveys.

Longnose Sucker tagged downstream of Devils Canyon did not use habitat significantly different than predicted based on availability, the confidence intervals for selection ratios overlapped with 1 (Figure 5.6-12). Selection ratios for each season are presented in Table 5.1-3; however, sample sizes during the overwinter and spawning periods were not sufficient for seasonal comparisons.

5.6.2.6. Inundation Zone/ZHI Use

Longnose Sucker tagged downstream of Devils Canyon primarily utilized areas within the zone of hydrologic influence. Twenty-one of 25 Longnose Sucker (84%) re-located on at least one aerial survey were found within the ZHI on all surveys (Table 5.1-1). Conversely, three fish (12%) remained in the Talkeetna River where they were tagged and were never detected within the ZHI. Twenty-two of 25 Longnose Sucker (88%) were detected within the reservoir inundation zone or ZHI on more than half of the aerial surveys in which they were detected. Ninety-three percent (180 of 193) of all fish positions downstream of Devils Canyon from aerial surveys were within the inundation zone/ZHI. Longnose Sucker detections outside of the ZHI occurred in the Talkeetna, Chulitna, and Susitna River downstream of Montana Creek and the extent of ZHI mapping. Longnose Sucker were not detected upstream of the ZHI in Indian River, the only Middle River tributary that tagged fish used. Sample sizes were not sufficient to complete seasonal comparisons of use of the ZHI (Table 5.1-1).

5.7. Northern Pike

5.7.1. Upper River and Middle River Upstream of Devils Canyon

5.7.1.1. Tagging

The distribution of Northern Pike in the study area is limited to the Lower Susitna River; no Northern Pike were tagged in the Upper River or Middle River upstream of Devils Canyon.

5.7.2. Middle River downstream of Devils Canyon and Lower River

5.7.2.1. Tagging

In 2013, a total of five Northern Pike were radio tagged in the Lower River downstream of Devils Canyon. All five Northern Pike were captured and tagged 3.3 river miles up Fish Creek, a tributary to Kroto Slough in the Lower River (PRM 34.1). Tagging occurred post-spawning during the Northern Pike foraging season in August 2013.

5.7.2.2. Tag Detection Summary

Northern Pike tagged in the Lower River with one or more live detections following the release day (n=4) were tracked for 144 to 439 days with a median 235 days (Table 5.1-1). One fish was not detected alive following release. The number of live detections received by individual tags ranged from 5 to 138 with a median of 21. No fish were detected at fixed stations. Four tagged fish (100%) were located on aerial surveys. The number of aerial surveys in which tags were detected ranged from 1 to 28 with a median of 5 surveys (Table 5.1-1). Northern Pike with active tags were monitored over a 15-month period (August 2013 to October 2014). The number of tags detected each month ranged from 0 (September and October 2013) to 5 in August 2013 (Table 4.2-3). All four Northern Pike remained in the Lower River downstream of the Three Rivers Confluence (PRM 102.4) for the entire monitoring duration. Because of small sample sizes, seasonal comparisons are limited.

Two Northern Pike (50%) tagged in the Lower River were detected alive on one or more aerial survey during the foraging season (Table 5.1-1). The number of aerial surveys in which tags were detected ranged from 1 to 17. Additionally, one radio tagged Northern Pike location during the foraging season was reported by the sport fishery. The locations of Northern Pike during the foraging season are depicted in Figure 5.7-1.

Three of four Northern Pike (75%) were detected alive on one or more aerial survey during the overwintering season (Table 5.1-1). The number of aerial surveys in which tags were detected ranged from 3 to 10 with a median of 7 surveys. The locations of Northern Pike during the overwintering season are depicted in Figure 5.7-2.

One of four Northern Pike (25%) was detected alive on one aerial survey during the spawning season (Table 5.1-1). The location of the fish during the spawning season is depicted in Figure 5.7-3.

5.7.2.3. Direction, Extent, and Home Range

Total distance traveled for Northern Pike with active tags with one or more detection following release (n=4) ranged from 1.9 to 30.4 river miles, the median distance was 6 river miles (Table 5.1-1). The home range size for most Northern Pike was small with no exception. Linear home range span for fish tracked 60 days or more (n=4) ranged from 0.9 to 30.4 miles with a median of 1.7 miles.

The majority of fish utilized a 2-3 mile long reach of Fish Creek during the foraging, overwintering and spawning seasons. Fish were relatively sedentary and, along with Lake Trout and Burbot, moved the least of any species during the monitoring period. Tagged fish tended to be near the confluence of Fish Creek with Kroto Slough in August and September, however, samples sizes were low and no seasonal directional movements were observed. One fish (Tag 9152) made an extensive upstream movement more than 25 miles up the Yentna River prior to being caught and reported in the sport fishery.

5.7.2.4. Movements Past Watana Dam and Devils Canyon

No Northern Pike (0%) tagged downstream of Devils Canyon exhibited an upstream movement past Impediment 1 (PRM 155.1), Impediment 3 (PRM 164.7), or the proposed Watana Dam location (PRM 187.1).

5.7.2.5. Habitat Use

All four Northern Pike (100%) utilized tributary habitat exclusively during the monitoring period. Three fish used one tributary and one fish used two tributaries. The most frequently used tributaries were Fish Creek (4 fish) and the Yentna River (1 fish). Of the four fish that utilized tributaries, 3 (75%) were detected only in the lower two miles (TRM 0.0-2.0), and one fish (25%) was detected 10 or more miles upstream in Fish Creek. Fish Creek and Yentna River accounted for 95% and 5% of all aerial survey detections during the monitoring period.

Northern Pike utilized mainstem and confluence habitat less than predicted based on availability; the selection ratio was 0, the habitats were never used. Conversely, tributary habitat was utilized more than predicted based on availability. However, because of small samples sizes, the confidence interval overlapped with 1 (indicating no selection); the selection ratio was 8.4±8.0 (Figure 5.7-4). Seasonal selection ratios are presented in Table 5.1-1; however, samples sizes were not sufficient to complete biologically meaningful seasonal comparisons of habitat use.

5.7.2.6. Use of Zone of Hydrologic Influence

All four tagged Northern Pike (100%) re-located during at least one aerial survey were found outside of the ZHI on all surveys. Tagged fish exclusively used tributary reaches in the lower river that are not within the ZHI (Figures 5.7-1, 5.7-2, and 5.7-3).

5.8. Rainbow Trout

5.8.1. Upper River and Middle River Upstream of Devils Canyon

5.8.1.1. Tagging

The distribution of Rainbow Trout in the study area extends from Devils Canyon in the Middle River downstream and including the Lower River. Rainbow Trout are likely present in High Lake in the Devil Creek drainage and one individual was observed in 2014 in Devil Creek (PRM 164.8; AEA 2015b, Study 9.5 SIR Section 5.1.1) located just upstream of Impediment 3 (PRM 164.7). However, no Rainbow Trout have been documented in the Upper River or mainstem Middle River upstream of Devils Canyon and no radio tagging occurred in this reach.

5.8.2. Middle River downstream of Devils Canyon and Lower River

5.8.2.1. Tagging

In 2013, a total of 44 Rainbow Trout were radio tagged in the Middle Susitna River downstream of Devils Canyon. Tags were generally distributed throughout the study area (Table 5.1-1). Twenty-three Rainbow Trout were tagged and released in the Middle Susitna River downstream of Devils Canyon and twenty-one fish were tagged in the Lower River and tributaries downstream of the Three Rivers Confluence (PRM 102.4). In the Middle River the majority of Rainbow Trout were tagged at Curry (Susitna River PRM 124.2; 9 fish), at the mouth and clearwater plume of Fourth of July Creek (PRM 134.3,6 fish), and at the mouth and clearwater plume of Indian River (PRM 142, 8 fish). The primary tagging locations in the Lower River were: Talkeetna River (PRM 100.5) near the confluence with Chunilna (Clear) Creek at River Mile 5.9-6.3 (8 fish), Montana Creek (PRM 80.8) at River Mile 2.3 (6 fish), and at the mouth of Montana Creek (PRM 80.9, 7 fish). Tagging occurred during the Rainbow Trout spawning season in June (11), and post-spawning during the foraging season in July (17), August (3), and September (13).

5.8.2.2. Tag Detection Summary

All of the Rainbow Trout tagged in the Middle River downstream of Devils Canyon and in the Lower River had one or more live detections following the release day (n=44) and were tracked for 6 to 649 days with a median 72 days (Table 5.1-1). The number of live detections received from individual tags ranged from 1 to 36,805 with a median of 535. Twenty-eight Rainbow Trout (64%) were detected at fixed stations and the number of fixed stations ranged from 1 to 6; however, 16 fish (36%) were only detected at one fixed station. All forty-four fish (100%) were located on aerial surveys. The number of aerial surveys in which tags were detected ranged from 1 to 58 with a median of 12 surveys. Rainbow Trout with active tags were monitored over a 26-month period (June 2013 to July 2015). The number of tags detected each month ranged from a low of 0 during several winter months in 2015 to a high of 28 in July and August of 2013 (Table 4.2-3).

Forty-four Rainbow Trout (100%) tagged downstream of Devils Canyon were detected alive on one or more occasions during the foraging season (Table 5.1-1). Twenty-seven Rainbow Trout (61%) were detected at fixed stations during the foraging season; the number of fixed stations ranged from 1 to 6 with 17 fish (39%) only detected at one fixed station. All forty-four fish were

detected on aerial surveys. The number of aerial surveys in which tags were detected ranged from 1 to 45 with a median of 7 surveys. The locations of Rainbow Trout released in the Middle and Lower River downstream of Devils Canyon during the foraging season is depicted in Figure 5.8-1.

Twenty Rainbow Trout (45%) tagged downstream of Devils Canyon were detected alive on one or more occasions during the overwintering season (Table 5.1-1). Two fish were detected at fixed stations during the winter; both were detected at a single station. Twenty tagged Rainbow Trout (100%) were located on aerial surveys. The number of aerial surveys in which tags were detected ranged from 8 to 18 with a median of 8.5 surveys. The locations of Rainbow Trout released in the Middle and Lower River downstream of Devils Canyon during the overwintering season is depicted in Figure 5.8-2.

Twenty-six Rainbow Trout (59%) tagged downstream of Devils Canyon were detected alive on one or more occasions during the spawning season (Table 5.1-1). Eight Rainbow Trout (18%) were detected at fixed stations during the spawning season and the number of fixed stations ranged from 1 to 4; 7 fish (16%) were only detected at one fixed station. Twenty-four fish were detected on aerial surveys. The number of aerial surveys in which tags were detected ranged from 1 to 6 with a median of 3 surveys. The locations of Rainbow Trout released in the Middle and Lower River downstream of Devils Canyon during the spawning season is depicted in Figure 5.8-3.

5.8.2.3. Direction, Extent, and Home Range

Rainbow Trout were found in foraging habitats in or near tributaries during the summer. Most fish remained associated with the same tributary throughout the summer but some fish moved between tributaries. During fall, fish dropped out of tributaries and concentrated at tributary mouths. In the winter most Rainbow Trout held in the Susitna River, typically in areas not associated with tributary mouths. The majority of fish overwintered in the same stretch of river where they foraged (i.e., fish that foraged in Indian River overwintered in the Middle River). During the overwinter period, use of tributaries was minimal and fish remained in a relatively confined range. In May, many Rainbow Trout left the Susitna River, presumably to spawn, but then returned in June and migrated to foraging locations. There was a variety of behaviors observed as some fish would use the same foraging and overwintering areas in successive years while other fish would use different foraging and overwintering locations each year. Some fish would utilize the same foraging location each year but have a different overwintering location each year. Fish 9061 and 9237 typified many of the migrational patterns observed in the Rainbow Trout population in the Middle River downstream of Devils Canyon and Lower River (Figure 5.8-1). Total distance traveled for Rainbow Trout with active tags was similar to Arctic Grayling and ranged from 0.1 to 171.4 river miles, the median distance was 23.7.2 river miles (Table 5.1-1). Linear home range span for fish tracked 60 days or more (n=25) ranged from 3.5 to 103.1 miles with a median distance of 17 miles.

Total distance traveled during the foraging season for trout with active tags ranged from 0.6 to 90.5 river miles, the median distance was 13.9 river miles. Linear home range span during the foraging season for fish tracked 60 days or more (n=25) ranged from 0.4 to 64.6 miles with a median distance of 7.0 miles.

The total distance traveled during the overwintering season was reduced compared to distances travelled during the foraging season ranged from 0.1 to 26.5 river miles, the median distance was less than half of foraging season at 6.6 river miles. Linear home range span during the overwintering season for fish tracked 60 days or more (n=20) ranged from 0.1 to 26.5 miles with a median distance of 3.5 miles.

Total distance traveled during the eight-week-long spawning season (April 1 to May 31) for Rainbow Trout with active tags ranged from 0.1 to 61.1 river miles, the median distance similar to that seen during overwintering at 5.0 river miles. Linear home range span during the spawning season for fish tracked 60 days or more (n=17) was similar to distance traveled, and ranged from 0.1 to 94.7 miles with a median distance of 6.5 miles.

The majority of tagged trout used a 5-10 mile long reach of the mainstem Susitna River and the lower 2-7 miles of one or two tributaries during the monitoring period. Figure 5.8-4 depicts the tracking history patterns for two individuals (Tag 9061 and 9237) monitored for more than a year; these fish traveled 62 and 37 miles, respectively. Still, the tagged population of Rainbow Trout did not exhibit strong seasonal movements that were directional in nature (Figure 5.8-5). Many individuals made upstream movements greater than 10 miles during the spawning period (May and June) and early foraging period (July) but this was not true of the tagged population as a whole, the median was near 0 net moment for each of these months (Figure 5.8-5). During the first half of the overwinter period in the months of November, December and January, the tagged population generally made small downstream movements (median 0.6-1 mile) and then were sedentary during the latter half of the over wintering period February-April with monthly median net movements of 0.0-0.1 miles (Figure 5.8.-5).

During the foraging period, Rainbow Trout where primarily found in the lower 10 mile-reach of tributaries and the Susitna River in tributary confluence areas, in particular Indian River, Fourth of July Creek, Talkeetna/Chunilna River, and Montana Creek (Figure 5.8-1). Some of the other fish bearingMiddle River tributaries including Whiskers Creek, Lane Creek, Gold Creek, and Portage River were not used by tagged Rainbow Trout. In the summer months, during periods of elevated discharge and water temperatures in the Susitna River, there was increased movement among and between tributaries and confluence areas.

As water temperatures cooled, discharge dropped, and turbidity decreased in the early fall, fish moved from tributaries to the mainstem and then to overwintering areas. During winter, Rainbow Trout used the mainstem Susitna River within a few miles of their spawning/foraging tributary. Subsets of the tagged population overwintered in the mainstem near the Montana Creek confluence (PRM 76-83) and between Fourth of July Creek and Indian River (PRM 130-142). Fewer individuals overwintered in the Susitna River between PRM 90 and PRM 130 and no fish utilized the reach upstream of Indian River (PRM 142.1). Four fish that overwintered near the Montana Creek confluence made forays of up to one mile upstream in Montana Creek. One individual overwintered 6 miles upstream in the Chulitna River (Figure 5.8-2).

Rainbow Trout were present in Montana Creek (3 fish), the Chulitna River (2 fish), Talkeetna River (1 fish), Fourth of July Creek (4 fish) and Indian River (3 fish) during the spawning season (Figure 5.8-3). Five additional fish were detected in the Lower River mainstem near Montana and Goose creeks and three fish found near the Fourth of July Creek confluence. These fish were

detected in the location on multiple occasions and likely spawned in the nearby tributaries. Rainbow Trout were detected as far as 6 miles up Indian River, 1 mile up Fourth of July Creek, and ten miles up Montana Creek during the spawning season.

Several migratory corridors were observed in the Middle and Lower River. Groups of fish migrated between Indian River (PRM 142.1) and downstream overwintering areas in the mainstem (PRM 134-138). Another group of fish migrated from their foraging locations several miles upstream in Montana Creek to their mainstem overwinter area between PRM 80 and PRM 89.

5.8.2.4. Movements Past Watana Dam Site and Devils Canyon

No Rainbow Trout tagged downstream of Devils Canyon exhibited an upstream movement past Impediment 1 (PRM 155.1), Impediment 3 (PRM 164.7), or the proposed Watana Dam location (PRM 187.1).

5.8.2.5. Habitat Use

Thirty-six of 44 Rainbow Trout (82%) utilized the mainstem Susitna River during the monitoring period. Thirty-eight of 44 Rainbow Trout (86%) entered one or more tributary streams during the monitoring period. Six fish (14%) utilized two or more tributaries. The most frequently used tributaries by fish tagged downstream of Devils Canyon were Montana Creek (11 fish), Fourth of July Creek (10 fish), Indian River (8 fish), and the Talkeetna River (8 fish). Eight fish were detected only in Montana Creek and the Talkeetna River for tracking durations ranging from ten to 41 days. Rainbow Trout moved considerable distances in tributaries upstream of the confluence area (defined here as the lower 300 meters). Of the 38 fish that entered tributaries, only two (5%) exclusively utilized only the lower three-tenths of a mile (TRM 0.0-0.3). Of fish that entered tributaries, 12 (32%) were detected in the lower two miles (TRM 0.0-2.0), and two fish (8%) were detected 10 or more miles upstream in tributaries.

Most Rainbow Trout utilized a variety of habitats during the monitoring period. Among habitat types, 35 Rainbow Trout (80%) were detected in mainstem non-confluence areas, 33 (75%) were detected in confluence areas, and 37 (84%) were detected in tributary non-confluence areas. Mainstem non-confluence, mainstem confluence, and tributary non-confluence accounted for 41%, 21%, and 38% of all fish positions from aerial surveys, respectively.

Rainbow Trout utilized tributary confluence and tributary habitat much more than predicted based on availability, the mean selection ratios were 2.6±1.0 and 2.4±1.2 (Table 5.1-3; Figure 5.8-6). Conversely, mainstem (non-confluence) habitat was utilized significantly less than predicted based on availability, the selection ratio was 0.7±0.2 (Figure 5.8-6).

Thirty-five of 44 Rainbow Trout (80%) utilized the mainstem Susitna River during the foraging period (Figure 5.8-3). Thirty-seven of 44 Rainbow Trout (84%) entered one or more tributary stream during the foraging period (Tables 5.1-1 and 5.1-4); five fish (11%) utilized two tributaries. The most frequently used tributaries were Montana Creek (11 fish), Fourth of July Creek (9 fish), Indian River (8 fish), and the Talkeetna River (8 fish). Rainbow Trout typically utilized several miles of tributary streams during the foraging period. Of the 37 fish that entered tributaries, 2 (5%) utilized only the lower three-tenths of a mile (TRM 0.0-0.3) near the mouth. Of fish that

entered tributaries, 12 (32%) were detected in the lower two miles (TRM 0.0-2.0), and only 1 fish (3%) was detected 10 or more miles upstream in a tributary (Indian River). Among habitat types, 32 Rainbow Trout (73%) were detected in mainstem non-confluence areas, 32 (73%) were detected in confluence areas, and 36 (82%) were detected in tributary non-confluence areas during the foraging season. During the foraging season, Rainbow Trout tagged downstream of Devils Canyon utilized tributary confluence and tributary habitat much more than predicted based on availability, the mean selection ratios were 3.1±1.3 and 2.5±1.2, respectively (Table 5.1-3; Figure 5.8-6). Conversely, mainstem (non-confluence) habitat was utilized significantly less than predicted based on availability; selection ratio was 0.5±0.2 (Table 5.1-3; Figure 5.8-6).

Nineteen of 20 Rainbow Trout (95%) utilized the mainstem Susitna River during the overwintering period (Figure 5.8-2). Six of 19 Rainbow Trout (32%) entered one tributary stream during the overwintering period (Tables 5.1-1 and 5.1-4); no fish utilized two tributaries. The most frequently used tributaries were Montana Creek (4 fish), Fourth of July Creek (1 fish), and the Chulitna River (1 fish). Rainbow Trout typically utilized small reaches of tributary streams during the overwintering period. Of the 6 fish that entered tributaries, 3 (50%) utilized only the lower three-tenths of a mile (TRM 0.0-0.3) near the mouth. Of fish that entered tributaries, 5 (83%) were detected in the lower two miles (TRM 0.0-2.0). One fish was detected 6.2 river miles up the Chulitna River where it overwintered. Among habitat types, 19 Rainbow Trout (95%) were detected in mainstem non-confluence areas, 10 (50%) were detected in confluence areas, and 3 (15%) were detected in tributary non-confluence areas during the foraging season. During the overwintering season, Rainbow Trout tagged downstream of Devils Canyon utilized mainstem (non-confluence) and tributary confluence habitat types as predicted based on availability, the mean selection ratios were 1.2±0.2 and 1.4±1, respectively (Table 5.1-3; Figure 5.8-6). Conversely, tributary habitat was utilized significantly less than predicted based on availability, selection ratio was 0.3±0.5 (Table 5.1-3; Figure 5.8-6).

Twenty-three of 26 Rainbow Trout (88%) utilized the mainstem Susitna River during the spawning period (Figure 5.8-3). Thirteen of 26 Rainbow Trout (50%) entered one tributary stream during the overwintering period (Tables 5.1-1 and 5.1-4); no fish utilized two tributaries. The most frequently used tributaries were Fourth of July Creek (4 fish), Montana Creek (3 fish), Indian River (3 fish), and the Chulitna River (2 fish). Rainbow Trout utilized a variety of reach lengths in tributary streams during the spawning period. Of the 13 fish that entered tributaries, no fish exclusively utilized the lower three-tenths of a mile (TRM 0.0-0.3) near the mouth. Of fish that entered tributaries, six (46%) were detected in the lower two miles (TRM 0.0-2.0) and the remaining seven utilized the lower ten river miles. Among habitat types, 20 Rainbow Trout (77%) were detected in mainstem non-confluence areas, 13 (50%) were detected in confluence areas, and 13 (50%) were detected in tributary non-confluence areas during the spawning season. During the spawning season, Rainbow Trout tagged downstream of Devils Canyon did not utilize habitat types significantly more or less than predicted based on availability (Table 5.1-3; Figure 5.8-6).

5.8.2.6. Inundation Zone/ZHI Use

Overall, Rainbow Trout utilized areas both within and outside of the zone of hydrologic influence in the Middle River downstream of Devils Canyon. Six of the 44 Rainbow Trout (14%) re-located on at least one aerial survey were found within the ZHI on all surveys (Table 5.1-1). Conversely, 12 fish (27%) were found exclusively in tributaries or the Lower River downstream of preliminary

geomorphic mapping of the ZHI, PRM 80, and were never detected within the ZHI. Most of the individuals that were not detected within the ZHI were found in Montana Creek (5 fish) and the Talkeetna River (5 fish) with short tracking durations, 10 to 47 days. Twenty-one of 44 Rainbow Trout (48%) were detected within the ZHI on more than half of the aerial surveys in which they were detected. Fifty-one percent (376 of 737) of all rainbow positions downstream of Devils Canyon from aerial surveys were within the ZHI.

During the foraging period, Rainbow Trout were detected both in the mainstem and tributaries upstream of the ZHI (Figure 5.8-1). Areas upstream of the Inundation Zone in Indiana River, Fourth of July Creek, Montana Creek, Talkeetna River and Sherman Creek accounted for 52 percent of Rainbow detections during the foraging period. The mainstem Susitna River within the ZHI accounted for 40 percent of detections during the foraging period. The mainstem Lower River downstream of preliminary geomorphic mapping of the ZHI (PRM 80) accounted for 8% of detections during the foraging period.

Seven of the 44 Rainbow Trout (16%) re-located on at least one aerial survey during the foraging season were found within the ZHI on all surveys (Table 5.1-1). Conversely, 13 fish (29%) were never detected within the ZHI during the foraging season. Fifteen of 44 Rainbow Trout (34%) were detected within the ZHI on more than half of the aerial surveys in which they were detected during the foraging season.

During the overwintering period, Rainbow Trout were detected both in the mainstem and tributaries upstream of the ZHI (Figure 5.8-1). Tributaries upstream of the Inundation Zone were used less than during the foraging season; Montana Creek, Fourth of July Creek, and the Chulitna River accounted for 6 percent of Rainbow detections during the overwintering period. The mainstem Susitna River within the ZHI accounted for 79 percent of aerial detections during the overwintering period. The mainstem Lower River downstream of preliminary geomorphic mapping of the ZHI (PRM 80) accounted for 15% of detections during the overwintering period.

The ZHI was just exclusively by a higher proportion of fish in the winter than the foraging period. Eleven of the 20 Rainbow Trout (55%) re-located on at least one aerial survey during the overwintering season were found within the ZHI on all surveys (Table 5.1-1). Conversely, only 4 fish (20%) were never detected within the ZHI during the overwintering season. These individuals overwintered in the Lower River between PRM 70-80 and in the Chulitna River. Sixteen of 20 Rainbow Trout (80%) were detected within the ZHI on more than half of the aerial surveys in which they were detected during the overwintering season.

During the spawning period, Rainbow Trout were detected both in the mainstem and tributaries upstream of the ZHI (Figure 5.8-1). Tributaries upstream of the Inundation Zone were used proportionally more than the foraging and overwintering seasons; Montana Creek, Indian River, Fourth of July Creek, Chulitna River, and the Talkeetna River accounted for 40 percent of Rainbow aerial detections during the spawning period. The mainstem Susitna River within the ZHI accounted for 47 percent of aerial detections during the overwintering period. The mainstem Lower River downstream of preliminary geomorphic mapping of the ZHI (PRM 80) accounted for 13% of detections during the overwintering period.

Many individuals were documented moving in or out of tributaries during the spawning season. Seven of 26 Rainbow Trout (27%) re-located on at least one aerial survey during the overwintering season were found within the ZHI on all surveys (Table 5.1-1). Conversely, 5 fish (19%) were never detected within the ZHI during the spawning season. Eleven of 26 Rainbow Trout (42%) were detected within the ZHI on more than half of the aerial surveys in which they were detected during the spawning season.

5.9. Round Whitefish

5.9.1. Upper River and Middle River Upstream of Devils Canyon

5.9.1.1. Tagging

In 2013 and 2014, a total of 41 Round Whitefish were radio tagged upstream of Devils Canyon. Fish were tagged and released in the Upper River between PRM 196.4 and the mouth of the Tyone River (PRM 247.3). Tags were generally distributed throughout the Upper River study area (Table 5.1-1). The primary tagging locations in the Upper River were: Watana Creek (PRM 196.9) near the mouth (6 fish), Susitna River at PRM 198.9 (10 fish), and the Susitna River at PRM 206.7 (14 fish). Tagging occurred pre-spawning during the Round Whitefish foraging season in, September 2013 (18 fish), June 2014 (7 fish) and September 2014 (16).

5.9.1.2. Tag Detection Summary

All 41 Round Whitefish tagged in the Upper River had one or more live detections following the release day (n=41) and were tracked for 15 to 623 days with a median 102 days (Table 5.1-1). The number of live detections received by individual tags ranged from 5 to 43,295 with a median of 699. Twenty-four Round Whitefish (59%) tagged upstream from Devils Canyon were detected at fixed stations. The number of fixed stations ranged from one to three with a median of one station. Forty-one Round Whitefish (100%) were detected on aerial surveys. The number of aerial surveys in which tags were detected ranged from 1 to 35 with a median of 7 surveys. Round Whitefish with active tags were monitored in the study area upstream of Devils Canyon over a 22-month period (September 2013 to June 2015). The number of tags detected each month released upstream of Devils Canyon ranged from a low of 5 in May, 2014 to a high of 24 in September, 2014 (Table 4.2-3).

Forty-one Round Whitefish (100%) were detected alive on one or more occasions during the foraging season (Table 5.1-1). Twenty-two Round Whitefish (69%) tagged upstream from Devils Canyon were detected at fixed stations during foraging. The number of fixed stations that individuals were detected at ranged from one to three. Thirty-seven tagged fish (90%) were located on aerial surveys. The number of aerial surveys in which tags were detected ranged from 1 to 24 with a median of 2 surveys. The locations of Round Whitefish released in the Upper River and Middle River upstream of Devils Canyon during the foraging season are depicted in Figure 5.9-1.

Thirty-seven Round Whitefish (90%) were detected alive on one or more occasions during the spawning season (Table 5.1-1). Thirteen Round Whitefish (32%) tagged upstream from Devils Canyon were detected at fixed stations during the spawning season; the number of stations ranged from 1 to 3. Thirty-five Round Whitefish (85%) were located on aerial surveys. The number of

aerial surveys in which tags were detected ranged from 1 to 2 with a median of 2 surveys. The locations of Round Whitefish released in the Upper River and Middle River upstream of Devils Canyon during the spawning season is depicted in Figure 5.9-2.

Twenty-seven Round Whitefish (66%) were detected alive on one or more occasions during the overwintering season (Table 5.1-1). No Round Whitefish were detected at fixed stations during winter. Twenty-four tagged fish (62%) were located on aerial surveys. The number of aerial surveys in which tags were detected ranged from 1 to 17 with a median of 6 surveys. The locations of Round Whitefish released in the Upper River and Middle River upstream of Devils Canyon during the overwintering season is depicted in Figure 5.9-3.

5.9.1.3. Direction, Extent, and Home Range

Total distance traveled for active tags with one or more detections following release ranged from 0.5 to 170.6 river miles, the median distance was 23.9 river miles (Table 5.1-1). Linear home range span for fish tracked 60 days or more (n=26) ranged from 5.1 to 99.7 miles with a median distance of 16.2 miles.

Total distance traveled during the foraging season for Round Whitefish with active tags ranged from 0 to 101.4 river miles, the median distance was 3.9 river miles. Linear home range span during the foraging season for fish tracked 60 days or more (n=24) ranged from 0.1 to 99.7 miles with a median distance of 8.7 miles. Upstream from the Inundation Zone, Round Whitefish were detected at the mouths of the Oshetna River and Goose Creek (Figure 5.9-1). Within the Inundation Zone most Round Whitefish were detected in the mainstem from Kosina Creek downstream to the Watana Dam site (83% of detections). Round Whitefish also were detected in Kosina, Watana, and Deadman creeks during the foraging season. In Kosina Creek, two Round Whitefish were detected upstream of the Inundation Zone. One Round Whitefish that migrated downstream through Devils Canyon spent the foraging period near Whiskers Creek in the Middle River.

The total distance Round Whitefish traveled during the four-week spawning season (October 1 to October 31) ranged from 0 to 31.9 river miles; the median distance was 2.2 river miles. Most individuals moved downstream for spawning but remained the in vicinity of foraging locations. Linear home range span during the spawning season for fish tracked 60 days or more (n=18) was similar to distance traveled, and ranged from 0.1 to 23.4 miles with a median distance of 3.3 miles. During the spawning season 84% of Round Whitefish detections occurred in the mainstem Susitna River from Jay Creek to Deadman Creek. Tributary mouths where fish were located included Oshetna River, Goose Creek, Jay Creek, Kosina Creek, and Watana Creek (Figure 5.9-2).

The extent of Round Whitefish movement was greater during overwintering than both the foraging and spawning seasons; however home range was more constricted than during the foraging season. The total distance traveled during the overwintering season for active tags with one or more detection following release ranged from 0.5 to 30.8 river miles, the median distance was 8.7 river miles. Linear home range span during the overwintering season for fish tracked 60 days or more (n=20) ranged from 0.5 to 23.1 miles with a median distance of 5.6 miles. During the overwintering period, most Round Whitefish (91%) detections were in the Susitna River from Jay

Creek downstream to Fog Creek. The only tributary used by fish during the overwintering period was the Tyone River where two fish were detected near the mouth (Figure 5.9-3).

In the summer, Round Whitefish in the Upper River were distributed throughout a variety of habitats. Fish were located in the Upper River mainstem, in tributaries, as well as at tributary mouths. Most fish during this time were found from Kosina Creek downstream to Tsusena Creek (83% of detections). In the fall, fish in tributaries dropped back to the mainstem and the general population moved down the Susitna River from where they foraged. Overwintering activity was primarily located in the Susitna River from a few miles downstream of Kosina Creek to Fog Creek (83% of detections). A small number of fish remained between the Tyone River and Goose Creek during the entire year. Fish 9198 typified the general movement pattern of Round Whitefish in the Upper River (Figure 5.9-4). Most Round Whitefish traveled approximately 20 miles over the course of a year with varied movements throughout the year.

The majority of Round Whitefish had a home range consisting of a 10-15 mile reach of the mainstem Susitna River and occasionally the lower reach a tributary stream within that reach during the foraging, overwintering and spawning seasons. Round Whitefish activity upstream of Devils Canyon was concentrated in the Mainstem from Fog Creek (PRM 179.3) upstream to Jay Creek (PRM 211). Figure 5.9-4 is an example tracking history for a Round Whitefish tracked over 623 days that utilized a 47.4 mile home range consisting of the Susitna River and lower 15 miles of Kosina Creek.

The tagged population of Round Whitefish made seasonal movements in the mainstem Susitna River that were directional in nature (Figure 5.9-5). Fish made upstream movements from in late winter (March) through the early foraging season (June). Pronounced downstream movements were made during the spawning (October) and early winter (November and December) periods (Figure 5.9-5). The greatest median monthly movement distance observed was in 3.4 miles in downstream direction in December (Figure 5.9-5). Movements were generally limited during the January-February overwinter period and in July as fish transitioned from upstream to downstream movement patterns.

Radio tagged Round Whitefish did not appear to aggregate during any season, make long-distance movements, and no migratory corridors were observed. Twenty-three Round Whitefish (56%) exclusively utilized the twenty-mile segment of the mainstem from PRM 189-209.2 and associated tributaries during the foraging season. The Middle River between Impediment 3 and the Fog Creek as well as the Upper River between PRM 213 to 235 were rarely used by Round Whitefish. Fourteen Round Whitefish (34%) utilized Watana Creek (RM 0-6.7) and the Kosina Creek (RM 0.0-15) during the foraging season (Figure 5.9-1). During the spawning season, most Round Whitefish (76%) utilized small portions of the mainstem between PRM 192 and 210; fish were spread evenly along this section (Figure 5.9-3). Tributaries were not utilized much during the spawning season; two fish (5%) were detected in the Tyone River. During overwintering, tagged fish were concentrated in the mainstem between PRM 189 and 202 (Figure 5.9-4). This section of river was also heavily utilized by other resident species for overwintering, notably Burbot and Arctic Grayling, and Longnose Sucker.

Round Whitefish rarely utilized or migrated through a twenty-two mile stretch of Upper Susitna River (PRM 211-232) from near Goose Creek (PRM 232.8) to just downstream of Jay Creek (PRM

211). Only two Round Whitefish were detected in this section of river, accounting for 0.9% of all aerial detections.

5.9.1.4. Movements Past Watana Dam Site and Devils Canyon

Eleven of 41 Round Whitefish (27%) tagged upstream from Devils Canyon with active tags exhibited a movement past the proposed Watana Dam location (PRM 187.1). Of the eleven fish that passed the dam site, nine (82%) made only a downstream movement, one fish (9%) made both an upstream and downstream movement and one fish made two upstream and two downstream movements during the monitoring period (Table 5.1-1). The number of movements past the dam site was variable by season, with most occurring during the overwintering season (6 fish), followed by the foraging (5 fish) and spawning seasons (2 fish; Table 5.1-2). Most movements downstream past the dam site occurred in December (5) followed by fewer in June (3) and August (1), September (2), October (2), November (1) and January (1).

Four Round Whitefish (10%) tagged upstream from Devils Canyon with one or more live detection following release exhibited a downstream movement past Impediments 3 (PRM 164.7) one fish was detected as a mortality and three fish were detected alive. These three fish continued downstream and were detected alive downstream of Impediment 1 (PRM 160.5). Downstream movements through Devils Canyon occurred during the foraging and overwintering seasons in May (1), August (1) and December (1). No Round Whitefish were observed passing upstream past Impediment 1 or Impediment 3 in Devils Canyon.

5.9.1.5. Habitat Use

All forty-one Round Whitefish (100%) with one or more live detections used the mainstem Susitna River during the monitoring period. Nineteen of 41 Round Whitefish (46%) entered one or more tributary stream during the monitoring period. One fish (2%) utilized two tributaries Kosina Creek and Gilbert Creek in the Kosina Creek drainage. The most frequently used tributaries by fish tagged upstream from Devils Canyon were: Watana Creek (8 fish), Kosina Creek (6 fish) and the Tyone River (2 fish). Of the 19 fish that entered tributaries, 4 (21%) utilized only the lower three-tenths of a mile (TRM 0.0-0.3) and eight fish used the lower two river miles. One fish (5%) was detected more than 10 miles upstream in the Kosina Creek. Among habitat types, 39 Round Whitefish (95%) were detected in mainstem non-confluence areas, 37 (90%) were detected in confluence areas, and 10 (24%) were detected in tributary non-confluence areas. Mainstem non-confluence, confluence, and tributary non-confluence accounted for 71%, 23%, and 6% of all fish positions respectively upstream from Devils Canyon from aerial surveys.

Overall, Round Whitefish tagged upstream of Devils Canyon used confluence habitat significantly more than predicted based on availability, and tributary habitat significantly less than predicted based on availability (Table 5.1-3; Figure 5.9-6). Mainstem, non-confluence habitat was utilized as predicted based on availability. In particular, the selection ratio for confluence habitat was very high 3.3±1.3 and tributary habitat was very low, 0.2±0.2 indicating strong habitat selection by Round Whitefish (Figure 5.9-6).

All 41 Round Whitefish (100%) utilized the mainstem Susitna River during the foraging period. Eighteen fish (44%) entered one tributary stream during the foraging period (Tables 5.1-1 and 5.1-

4). One fish (2%) utilized two tributaries Kosina Creek and Gilbert Creek in the Kosina Creek drainage. The most frequently used tributaries by fish tagged upstream from Devils Canyon were: Watana Creek (8 fish) and Kosina Creek (6 fish). Of the 18 fish that entered tributaries during the foraging season, 10 (56%) utilized only the lower three-tenths of a mile (TRM 0.0-0.3). Twelve fish were detected more than 2 miles upstream in a tributary during the foraging period and one fish moved more than ten miles up Kosina Creek. Among habitat types, 36 Round Whitefish (88%) were detected in mainstem non-confluence areas, 29 (71%) were detected in confluence areas, and 9 (22%) were detected in tributary non-confluence areas. Mainstem non-confluence, confluence, and tributary non-confluence accounted for 69%, 21%, and 10% of all fish positions respectively upstream from Devils Canyon from aerial surveys.

During the foraging season, Round Whitefish tagged upstream of Devils Canyon utilized mainstem non-confluence more than predicted based on availability and tributary habitat less than predicted (Figure 5.9-6). Confluence habitat had a high selection ratio (2.5±1.6) but did not differ from the predicted value 1.

During the spawning season, 35 of 37 Round Whitefish (95%) utilized the mainstem Susitna. Two Round Whitefish (5%) entered a tributary stream during the spawning period (Tables 5.1-1 and 5.1-4). The only tributary used by tagged Round Whitefish during the spawning season was the Tyone River. One fish used the lower 0.3 river miles and the other the lower two river miles. Among habitat types, 29 Round Whitefish (78%) were detected in mainstem non-confluence areas, 21 (57%) were detected in confluence areas, and 2 (5%) were detected in tributary non-confluence areas. During the spawning season, mainstem non-confluence, confluence, and tributary non-confluence accounted for 65%, 31%, and 4% of all fish positions respectively upstream from Devils Canyon from aerial surveys.

During the spawning season, Round Whitefish tagged upstream of Devils Canyon did not utilize mainstem, non-confluence or confluence habitat differently than predicted based on availability, the mean selection ratios were 1.1 and 1.6 respectively (Table 5.1-3). Consistent with foraging and overwintering seasons; tributary habitat use was utilized significantly less than predicted based on availability during spawning, with a selection ratio of 0.1±0.2 (Figure 5.9-6).

During the overwintering season, 27 Round Whitefish (100%) utilized the mainstem Susitna River. Compared to the foraging and spawning seasons the proportion of fish utilizing a tributaries decreased. No Round Whitefish entered a tributary stream during the overwintering period (Tables 5.1-1 and 5.1-4). Among habitat types, 26 Round Whitefish (96%) were detected in mainstem non-confluence areas, 14 (52%) were detected in confluence areas, and 0 (0%) were detected in tributary non-confluence areas. Mainstem non-confluence, confluence, and tributary non-confluence accounted for 76%, 24%, and 0% of all fish positions, respectively upstream from Devils Canyon from aerial surveys.

During the overwintering season, Round Whitefish tagged upstream of Devils Canyon utilized mainstem non-confluence and confluence habitat significantly more than predicted and tributary non-confluence habitat significantly less than predicted based on availability (Table 5.1-3; Figure 5.9-6).

5.9.1.6. Inundation Zone/ZHI Use

Round Whitefish tagged upstream of Devils Canyon primarily utilized areas that would be within the reservoir inundation zone upstream of the proposed Watana Dam location and within the zone of hydrologic influence downstream. Thirty-four of the 41 Round Whitefish (83%) re-located on at least one aerial survey were found within the reservoir inundation zone or ZHI on all surveys (Table 5.1-1). Conversely, 3 fish (7%) were never detected within the reservoir inundation zone or ZHI. Thirty-eight of 41 Round Whitefish (93%) were detected within the reservoir inundation zone or ZHI on more than half of the aerial surveys in which they were detected. Ninety-six percent (408 of 425) of all fish positions upstream from Devils Canyon from aerial surveys were within the inundation zone/ZHI. Upstream of the proposed Watana Dam location, 95% (338 of 355) of all fish positions from aerial surveys were within the inundation zone. Round Whitefish detections outside of the inundation zone occurred in the Susitna and Tyone rivers upstream of the full pool elevation (PRM 232.5) of the proposed reservoir. One Round Whitefish was detected upstream of the reservoir inundation zone in Kosina and Gilbert creeks, tributaries that would be partially inundated by the reservoir. In the reach between Impediment 3 (PRM 164.7) and the proposed dam site (PRM 187.1), all nine Round Whitefish (100%) re-located on at least one aerial survey were found within the ZHI on all surveys.

Round Whitefish use of the inundation zone/ZHI was consistent among seasons. Thirty-two of 37 Round Whitefish (86%) re-located on at least one aerial survey during the foraging season were found within the reservoir inundation zone or ZHI on all surveys (Table 5.1-1). Conversely, 2 fish (5%) were never detected within the reservoir inundation zone or ZHI during the foraging season. Thirty-five of 37 Round Whitefish (95%) were detected within the reservoir inundation zone or ZHI on more than half of the aerial surveys in which they were detected during the foraging season. During the foraging period, fish upstream of Devils Canyon were dispersed throughout mainstem, 97% of aerial detections were within the inundation zone/ZHI with some detection clusters near tributary mouths (Figure 5.9-1). Round Whitefish were detected upstream of the inundation zone in the Susitna River the lower Tyone River, and in Kosina/Gilbert Creek accounting for around 5 percent of all aerial detections during the foraging period.

Thirty-two of 35 Longnose Sucker (91%) re-located on at least one aerial survey during the spawning season were found within the reservoir inundation zone or ZHI on all surveys (Table 5.1-1). Conversely, 3 fish (9%) were never detected within the reservoir inundation zone or ZHI during the spawning season. During the spawning period, fish upstream of Devils Canyon were dispersed throughout mainstem, 91% of aerial detections were within the inundation zone/ZHI with some detection clusters near Watana Creek (Figure 5.9-2).

All twenty-seven Round Whitefish (100%) re-located on at least one aerial survey during the overwintering season were found within the reservoir inundation zone or ZHI on all surveys (Table 5.1-1).

5.9.2. Middle River Downstream of Devils Canyon and the Lower River

5.9.2.1. Tagging

In 2013, a total of 21 Round Whitefish were radio tagged in the Lower River and Middle River downstream of Devils Canyon. Fish were tagged and released between the Talkeetna River (PRM 100.2) and the mouth of Indian River (PRM 142.3). Tags were generally distributed throughout the Middle River study area (Table 5.1-1). The primary tagging locations in the Middle River were: Susitna River at Curry (PRM 124.2; 12 fish), near the mouth of Fourth of July Creek (PRM 134.3; 6 fish), near the mouth of Indiana River (PRM 142-142.3; 2 fish), and at RM 5.9 in the Talkeetna River (PRM 100.2; 1 fish). Tagging occurred pre-spawning during the Round Whitefish foraging season in June (11 fish), July (3 fish) and September (7 fish), 2013.

5.9.2.2. Tag Detection Summary

Round Whitefish tagged (n=21) in the Middle and Lower River with one or more live detections following the release day (n=21) were tracked for 5 to 575 days with a median 114 days (Table 5.1-1). The number of live detections (pings) received by individual tags ranged from 8 to 7,204 with a median of 245. Seventeen Round Whitefish (81%) tagged downstream of Devils Canyon were detected at fixed stations. The number of fixed stations ranged from one to five with a median of one station. Twenty-one Round Whitefish (100%) were detected on aerial surveys. The number of aerial surveys in which tags were detected ranged from 1 to 48 with a median of 12 surveys. Round Whitefish with active tags were monitored in the study area downstream of Devils Canyon over a 25-month period (June 2013 to June 2015). The number of tags detected each month released upstream of Devils Canyon ranged from a low of 1 in October 2014 through June 2015 to a high of 18 in September, 2013 (Table 4.2-3).

All twenty-one Round Whitefish (100%) were detected alive on one or more occasions during the foraging season (Table 5.1-1). Fourteen Round Whitefish (69%) were detected at fixed stations during foraging period, the number of fixed stations never range from one to five. Seventeen tagged fish (81%) were located on aerial surveys. The number of aerial surveys in which tags were detected ranged from 1 to 27 with a median of 11 surveys. The locations of Round Whitefish released in the Lower River and Middle River downstream of Devils Canyon during the foraging season are depicted in Figure 5.9-7.

Thirteen Round Whitefish (62%) were detected alive on one or more occasions during the spawning season (October 1-October 31; Table 5.1-1). Five Round Whitefish (24%) were detected at one fixed station during the spawning season. Thirteen Round Whitefish (62%) were located on aerial surveys. The number of aerial surveys in which tags were detected ranged from 1 to 7 with a median of 2 surveys. The locations of Round Whitefish released in the Lower River and Middle River downstream of Devils Canyon during the spawning season is depicted in Figure 5.9-8.

Eleven Round Whitefish (52%) were detected alive on one or more occasions during the overwintering season (Table 5.1-1). One Round Whitefish (5%) was detected at a single fixed station during the winter. Eleven tagged fish (52%) were located on aerial surveys. The number of aerial surveys in which tags were detected ranged from 2 to 14 with a median of 7 surveys. The

locations of Round Whitefish released in the Upper River and Middle River upstream of Devils Canyon during the overwintering season is depicted in Figure 5.9-9.

5.9.2.3. Direction, Extent, and Home Range

Total distance traveled for Round Whitefish active tags Downstream of Devils Canyon ranged from 4.6 to 177.1 river miles. The median distance was more than double that observe for the population of tagged Round Whitefish upstream of Devils Canyon, 56.8 river miles (Table 5.1-1). Linear home range span for fish tracked 60 days or more (n=18) ranged from 1.7 to 92.2 miles and the median home range at 38 miles was more than twice that observed upstream of Devils Canyon.

Total distance traveled during the foraging season for active Round Whitefish tags ranged from 7.7 to 92.2 river miles, the median distance was 52.1 river miles. Linear home range span during the foraging season for fish tracked 60 days or more (n=14) ranged from 2.7 to 92.2 miles with a median distance of 35.6 miles. During the foraging season, nine Round Whitefish (43%) exclusively utilized the forty-five mile segment of the mainstem from Curry (PRM 124) and Portage Creek (PRM 152.3) and associated tributaries during the foraging season. The Lower River between Caswell Creek (PRM 67.4) and Montana Creek (PRM 80.8) was rarely used by Round Whitefish; however several fish moved downstream of this reach and used the mainstem between the Yentna and Kashwitna rivers. During the foraging season Round Whitefish were most common from Indian River downstream to Lane Creek (74% of detections), near Talkeetna (3% of detections), and from Sheep Creek downstream to Willow Creek (5% of detections; Figure 5.9-7). Portage Creek and the Talkeetna River were both utilized by Round Whitefish during the foraging period.

Total distance traveled by Round Whitefish during the four-week spawning season (October 1 to October 31) ranged from 0.3 to 21.4 river miles; the median distance was 6.7 river miles. Most individuals exhibited a downstream movement just prior to spawning. Linear home range span during the spawning season for fish tracked 60 days or more (n=8) was similar to distance traveled during this short season, and ranged from 0.3 to 21.4 miles with a median distance of 6.7 miles. During the spawning season, fish activity in the Middle River was clustered near the confluences of Fourth of July Creek (PRM 134.3) and Indian River (142.1). In the Middle River, fish were detected near Indian River (22% of detections), Gold Creek (8% of detections), and 4th of July Creek (14% of detections). In the Lower River, fish were detected near the mouth of the Talkeetna River (8% of detections; Figure 5.9-8).

Similar to other resident fishes, movements were restricted during the overwintering period. The total distance traveled during the overwintering season for Round Whitefish with active tags ranged from 0.5 to 54.8 river miles, the median distance was 6.9 river miles. Linear home range span during the overwintering season for fish tracked 60 days or more (n=11) ranged from 0.5 to 54.8 miles with a median distance of 6.9 miles. Round Whitefish overwintered in the mainstem Middle and Lower River with only one fish detected in a tributary. Fish were primarily located between Indian River and Lane Creek (70% of detections), or near Talkeetna (6% of detections). Very few fish were detected downstream from the Parks Highway (Figure 5.9-9).

The majority of Round Whitefish utilized a large, 30-40 mile reach of the mainstem Susitna River and occasionally the lower reach of a tributary stream within that reach during the foraging,

overwintering and spawning seasons. Round Whitefish activity downstream of Devils Canyon was concentrated in the mainstem from the Three Rivers Confluence (PRM 100.2) upstream to Portage Creek (PRM 152.3). Several fish also used the Lower River from approximately River Mile 50 to the Middle River at Curry (PRM 124). Figure 5.9-10 is an example tracking history for two Round Whitefish tracked over 343 and 575 days that exhibited different movement patterns. Fish 9235 was only observed in the mainstem and had a very small home range, 5.7 miles with most activity between Gold Creek and Indian River. Fish 9011 had a much larger home range, 30 miles and traveled 6.3 miles up the Talkeetna River (Figure 5.9-10).

In the summer, Round Whitefish in the Middle River downstream of Devils Canyon and Lower River were distributed through a variety of habitats. Fish were located in the Susitna River mainstem, in tributaries, and at tributary mouths. Most fish during this time were found from Indian River downstream to Lane Creek (74% of detections). Other groups of fish were near Talkeetna (3% of detections) and in the Susitna River from Sheep Creek downstream to Willow Creek (5% of detections). In the fall, fish in tributaries dropped back to the mainstem but the general population occupied a similar range within the Middle River and upper extent of the Lower River. During the overwintering period fish were not common downstream of the Parks Highway.

The population of radio tagged Round Whitefish in the Middle and Lower Rivers did not appear to aggregate during any season but did on average make long-distance movements much longer than observed upstream from Devils Canyon. Migratory corridors between PRM 108-116 and PRM 120-122 were fish quickly moved through these areas but did not appear to linger to forage, spawn or overwinter. Another migratory corridor was observed in the Middle River from the mouth of Portage Creek downstream to the mouth of Indian River (10 miles). Round Whitefish passed through this area while migrating upstream to foraging areas in Portage Creek and while migrating downstream to overwintering areas downstream of Indian River.

The tagged population of Round Whitefish made seasonal movements in the mainstem Susitna River that were directional in nature (Figure 5.9-11). Similar to Round Whitefish tagged upstream of Devils Canyon, Middle River fish exhibited median upstream movement of over 4 river mile in late winter (April) as well as a median 3-mile upstream movement during the foraging period (July). Pronounced downstream movements were made in September. The median downstream movement in September was more than 13 river miles (Figure 5.9-11). Fish were sedentary during the spawning month of October and then commenced smaller downstream movements (median 1.4-2.7 river miles) presumably post-spawning during the early winter months of November and December (Figure 5.9-11). Movements were generally limited during the January-March overwinter period and in August as fish transitioned from upstream to downstream movement patterns.

5.9.2.4. Movements Past Watana Dam Site and Devils Canyon

No Round Whitefish (0%) tagged downstream of Devils Canyon exhibited an upstream movement past Impediment 1 (PRM 155.1), Impediment 3 (PRM 164.7), or the proposed Watana Dam location (PRM 187.1).

5.9.2.5. Habitat Use

All twenty-one Round Whitefish (100%) with one or more live detections utilized the mainstem Susitna River during the monitoring period. Ten of 21 Round Whitefish (48%) entered one or more tributary stream during the monitoring period. Two fish 10%) utilized two tributaries. Many tributaries were used, the most frequently used tributaries by fish tagged downstream of Devils Canyon were: Fourth of July Creek (3 fish), Portage Creek (2 fish), Chulitna River (2 fish), and the Talkeetna River (2 fish). Of the 10 fish that entered tributaries, 2 (20%) utilized only the lower three-tenths of a mile (TRM 0.0-0.3) and five fish used the lower two river miles. Two fish (20%) were detected more than 10 miles upstream in the Portage Creek. Among habitat types, 21 Round Whitefish (100%) were detected in mainstem non-confluence areas, 19 (90%) were detected in confluence areas, and 8 (38%) were detected in tributary non-confluence areas. Mainstem non-confluence, confluence, and tributary non-confluence accounted for 70%, 19%, and 11% of all fish positions respectively, downstream of Devils Canyon from aerial surveys.

Round Whitefish tagged downstream of Devils Canyon did not utilize habitats significantly more or less than predicted based on availability during the monitoring period including all seasons (Table 5.1-3; Figure 5.9-12). The average habitat section ratio for mainstem, non-confluence habitat was high (2.0), however the confidence interval overlapped with 1 (Figure 5.9-12) indicating no selection.

All 21 Round Whitefish (100%) utilized the mainstem Susitna River during the foraging period. Eight fish (38%) entered one or more tributary streams during the foraging period (Tables 5.1-1 and 5.1-4). One fish (2%) utilized two tributaries, the Chulitna River and Fourth of July Creek. The most frequently used tributaries by fish tagged downstream of Devils Canyon were: Portage Creek (2 fish), Chulitna River (2 fish), and the Talkeetna River (2 fish). Of the 8 fish that entered tributaries during the foraging season, 1 (13%) utilized only the lower three-tenths of a mile (TRM 0.0-0.3). Three fish (38% of fish that entered tributaries) utilized the lower 2 miles of tributaries and two fish (25%) were detected more than 10 miles upstream in Portage Creek during the foraging. Among habitat types, 16 Round Whitefish (76%) were detected in mainstem non-confluence areas, 18 (86%) were detected in confluence areas, and 7 (33%) were detected in tributary non-confluence areas (Table 5.1-3). Mainstem non-confluence, confluence, and tributary non-confluence accounted for 67%, 15%, and 8% of all fish positions respectively downstream of Devils Canyon from aerial surveys.

During the foraging season, Round Whitefish tagged downstream of Devils Canyon did not utilize habitats significantly more or less than predicted based on availability during the monitoring period including all seasons (Table 5.1-3; Figure 5.9-12). Average habitat section ratios were all near one indicating that use was proportional to availability.

During the spawning season, all thirteen Round Whitefish (100%) detected utilized the mainstem Susitna River. Two Round Whitefish (5%) entered tributary streams during the spawning period (Tables 5.1-1 and 5.1-4). One fish entered Fourth of July Creek and one fish entered Indian River. Both fish used the lower 0.3 river miles near the creek mouths. Among habitat types, 12 Round Whitefish (92%) were detected in mainstem non-confluence areas, 7 (54%) were detected in confluence areas, and 0 were detected in tributary non-confluence areas. During the spawning

season, mainstem non-confluence, confluence, and tributary non-confluence accounted for 69%, 31%, and 0% of all fish positions respectively downstream of Devils Canyon from aerial surveys.

During the spawning season, Round Whitefish tagged downstream of Devils Canyon did not utilize mainstem, non-confluence or confluence habitat differently than predicted based on availability, the mean selection ratios were 1.2 and 1.5 respectively (Table 5.1-3; Figure 5.9-12). Tributary non-confluence habitat use was utilized significantly less than predicted based on availability (not used) during spawning, with a selection ratio of 0.0±0.0 (Figure 5.9-12).

During the overwintering season, all 11 Round Whitefish (100%) utilized the mainstem Susitna River. Compared to the foraging and spawning seasons the proportion of fish utilizing tributaries decreased, only 1 of 11 Round Whitefish entered one tributary stream (Fourth of July Creek) during the overwintering period (Tables 5.1-1 and 5.1-4). The individual was detected more than 0.3 but less than 2 river miles up the tributary (Figure 5.9-9). Among habitat types, 11 Round Whitefish (100%) were detected in mainstem non-confluence areas, 8 (73%) were detected in confluence areas, and 1 (9%) were detected in tributary non-confluence areas. Mainstem non-confluence, confluence, and tributary non-confluence accounted for 78%, 21%, and 1% of all fish positions, respectively downstream of Devils Canyon from aerial surveys during the winter.

During the overwintering season, Round Whitefish tagged downstream of Devils Canyon did not utilize mainstem, non-confluence or confluence habitat differently than predicted based on availability, the mean selection ratios confidence interval overlapped with 1 (Figure 5.9-12). Tributary non-confluence habitat use was utilized significantly less than predicted based on availability during overwintering, with a selection ratio of 0.1±0.2 (Figure 5.9-12).

5.9.2.6. Inundation Zone/ZHI Use

Round Whitefish tagged downstream of Devils Canyon primarily utilized areas that would be within the zone of hydrologic influence downstream. Twelve of the 21 Round Whitefish (57%) re-located on at least one aerial survey were found within the ZHI on all surveys (Tables 5.1-1 and 5.1-3). Conversely, 1 fish (5%) was never detected within the ZHI. Nineteen of 21 Round Whitefish (90%) were detected within the reservoir inundation zone or ZHI on more than half of the aerial surveys in which they were detected. Eighty-two percent (225 of 275) of all fish positions downstream of Devils Canyon from aerial surveys were within the ZHI. Round Whitefish detections outside of the ZHI occurred in middle river tributaries, primarily Portage Creek, Indian River, and Fourth of July Creek as well as the Lower River downstream of preliminary geomorphic mapping of the ZHI (PRM 80) and Chulitna and Talkeetna Rivers.

Round Whitefish utilized areas with the ZHI more during overwinter and spawning and less during foraging when fish moved further upstream in tributaries. Six of 17 Round Whitefish (35%) re-located on at least one aerial survey during the foraging season were found within the reservoir inundation zone or ZHI on all surveys (Table 5.1-1). Conversely, 2 fish (12%) were never detected within the ZHI during the foraging season. Eleven of 17 Round Whitefish (65%) were detected within the ZHI on more than half of the aerial surveys in which they were detected during the foraging season. During the foraging period, fish downstream of Devils Canyon were dispersed throughout mainstem, 74% of aerial detections were within the ZHI with some detection clusters near tributary mouths (Figure 5.9-7).

Ten of 13 Round Whitefish (77%) re-located on at least one aerial survey during the spawning season were found within the ZHI on all surveys (Tables 5.1-1 and 5.1-3). Conversely, two Round Whitefish (15%) were never detected within the ZHI during the spawning season; 90% of aerial detections were within the ZHI (Figure 5.9-2).

Nine of 11 Round Whitefish (82%) re-located on at least one aerial survey during the overwintering season were found within the ZHI on all surveys (Table 5.1-1). No fish were ever detected within the ZHI during the overwintering season; 96% of aerial detections were within the ZHI (Figure 5.9-2).

6. DISCUSSION

Most of the individuals radio tagged exhibited a resident life history type. For fish monitored more than 30 days, the median home range size was 19.5 river miles. Arctic Grayling, Longnose Sucker, Rainbow Trout and Round Whitefish exhibited both resident and migratory life history types. Approximately half of Arctic Grayling exhibited a migratory life history type with a home range greater than 20 river miles. Middle River Arctic Grayling tagged downstream of Devils Canyon tended to exhibit a migratory life history type while those upstream of Devils Canyon tended to be exhibit resident behavior. In the Upper River, Arctic Graying were approximately half migratory and half resident. Approximately one quarter of the Longnose Sucker tagged exhibited a migratory life history type with a home range greater than 20 river miles; this pattern was consistent between the Middle and Upper River. Around one-third of the Rainbow Trout tagged in the Middle River exhibited a migratory life history type with a home range greater than 20 river miles. Approximately half of Round Whitefish observed exhibited a migratory life history type with a home range greater than 20 river miles. The proportion of migratory Round Whitefish was higher in the Middle River downstream of Devils Canyon, approximately three-quarters, compared to the Upper River where proportionally more fish exhibited resident fish behavior and around forty percent were migratory. Burbot, Lake Trout, and Northern Pike generally completed seasonal life history activities within a small area, and were not migratory.

Based on the movement patterns observed and habitats utilized during this study, Arctic Grayling, Burbot, Humpback Whitefish, Longnose Sucker and Round Whitefish relied heavily on areas within the proposed inundation area that would be affected by Watana Reservoir. Burbot in particular could be affected by the proposed habitat changes as they had small home range sizes within the ZHI and rarely entered tributaries; however, literature indicates that Burbot populations can do well in impoundments (Paragamian and Wakkinen 2008; Harrison et al. 2016). Lake Trout movements on the other hand were restricted to existing high lake basins. Of the twelve lakes identified within the reservoir inundation zone, Sally Lake, at 23 ha is the only lake larger than 4 ha and likely the only lake capable of supporting a Lake Trout population. Results of this tagging effort suggest Lake Trout inhabiting lakes above the reservoir inundation zone, such as Tsisi Lake, would be largely unaffected by the Project. Lake Trout in lakes that would be inundated, such as Sally Lake, would likely recruit to the newly created Watana Reservoir where they could potentially thrive depending on the food base available.

Most species and individuals did not heavily utilize tributary habitat above the reservoir inundation zone in tributaries that would be partially inundated (primarily Deadman, Watana, Kosina, and Jay

Creeks). Reservoir inundation would not directly affect upstream habitats but could facilitate access to the lower gradient plateau areas that may currently be difficult to access. In particular, a forty-foot barrier falls located in Deadman Creek would be inundated at full pool allowing fish access to areas upstream of this currently impassable feature.

In the Upper River, the mainstem associated species, Arctic Grayling, Burbot, Longnose Sucker, and Round Whitefish, heavily utilized the Upper River between PRM 189 and 211. Only a few individual Arctic Grayling exhibited upstream movement past Jay Creek and through Watana Canyon (PRM 225-226.5). Within the high-use segment, geomorphic reach UR-6, and in particular the segment immediately upstream of Watana Creek, between PRM 194-202, was heavily utilized during all seasons including overwintering by all four species. This segment of the Upper River is unique in that it is lower gradient, the main channel becomes braided, and off-channel habitats are more off-channel habitats are available.

In the Upper River the segment above Jay Creek, from PRM 211-230 was not utilized to the extent of the downstream reach or upstream between Goose Creek and the Tyone River. This section contains high gradient Vee Canyon (PRM 225-226.5) which was only ascended by Arctic Grayling and a single Round Whitefish. While Vee Canyon does not contain the degree of hydraulics and high gradient cascades found in Devils Canyon it does appear to inhibit the movements of some species, notably Burbot and Longnose Sucker. The lack of fish use in this reach of UR suggests limited connectivity between populations upstream and downstream of Vee Canyon (PRM 225-226.5).

More than a quarter of all fish tagged upstream of Devils Canyon exhibited a movement past the proposed location of Watana Dam (PRM 187.1). Of those fish that moved past the proposed dam site, 75 percent were observed passing the site only once in a downstream direction. Conversely, twenty-five percent of fish that moved past the dam site did so in an upstream direction at some point during the monitoring period. Arctic Grayling, Burbot, and Round Whitefish were observed making multiple movements upstream and downstream past the proposed dam location. Some Burbot individuals, even with small home range sizes of one to two miles, made multiple movements (up to eight) past the proposed dam site.

Radio tagged resident fish were only observed moving downstream through Devils Canyon no upstream movements past any of the three major impediments were observed. To date, only Chinook Salmon have been documented as capable swimming upstream past Impediments 1,2, and 3 (Study 9.7 SCR). Sockeye Salmon have been documented upstream of Impediment 1 but downstream of Impediment 2 (Study 9.7 SCR). The construction of Watana Dam would potentially fragment the populations of fish in the Middle River upstream of Devils Canyon below the dam site and Upper River upstream. Radio tagging of fish in this segment indicated that most Arctic Grayling in this section of river use Tsusena and Fog Creeks and the mainstem Susitna River and rarely move upstream of the proposed dam site. Some Burbot on the other hand relied heavily on the FA-184 area and the dam site.

Certain target species appeared to be more vulnerable to tagging related stress and mortality. Study wide, fourteen percent of all fish implanted with a radio tag were either determined to be a mortality within 30 days of tagging (n=42) or were monitored for a span of less than 30 days and never again detected in the study area alive or as mortality (n=15). Longnose Sucker and

Humpback Whitefish Varden appeared to be the most susceptible to tagging effects; more than a third of tagged individuals of these species either died within 30 days or were not detected more than 30 days from tagging. Conversely more than 94% of Burbot, Lake Trout, Northern Pike and Round Whitefish survived longer than thirty days. Arctic Grayling, Dolly Varden, and Rainbow Trout had moderate survival with nine to twenty-two percent mortality within 30 days or not detected more than 30 days after tagging. Some individuals also made long downstream migrations shortly after tagging; potentially a tagging related affect. In particular, several Longnose Sucker tagged near Watana Creek made downstream movements past the dam site and Devils Canyon and into the Middle River following tagging. Humpback Whitefish also exhibited downstream movements shortly after tagging and prior to mortality. Because of the short monitoring period prior to mortality it is not known whether these movements were biologically meaningful migrations or related to post-tagging stress. Long distance movements of this magnitude were not typically observed for these species.

6.1. Arctic Grayling

Arctic Grayling were radio tagged throughout the Upper and Middle Susitna River. Tracking data indicated that Arctic Grayling spent the majority of their time in the Susitna River and were found utilizing tributaries primarily during the foraging period. Both resident and highly migratory life history types were observed. In the Upper River, Arctic Grayling were more likely to remain in the Susitna River compared to the Middle and Lower River. This was somewhat in contrast to reports from the 1980s which found that Arctic Grayling were more common in tributaries (Delaney et al. 1981; Sautner and Stratton 1983). Movement patterns between tributary drainages were similar between this study and work in the 1980s (Sautner and Stratton 1983). Overwintering locations identified during this study add new information to the understanding to Arctic Grayling habits in the Susitna River drainage. Schmidt et al. (1984) theorized that some Arctic Grayling may overwinter in Portage Creek but that behavior was not observed in this study. All Arctic Grayling that foraged in Portage Creek migrated to the Susitna River for overwintering. Grayling in the Nenana River drainage, which borders the Upper Susitna River drainage, were also observed to spawn in an upper drainage tributary before dispersing throughout the Nenana River drainage to forage (Gryska 2006).

In the Upper River, radio tagged fish behavior was somewhat different than observed in the 1980s but not drastically so. Telemetry data added to the previous knowledge base especially in regards to overwintering habitat and spawning locations. This study documented several individuals making long distance upstream migrations in the spring to spawn and forage in the Tyone River. Study results met study objectives for Arctic Grayling in the Upper River. Although study results satisfied study objectives in the Middle River upstream of Devils Canyon, additional information is needed for fish in the Middle River downstream of Devils Canyon and the Lower River.

6.2. Burbot

Burbot were radio tagged throughout the Susitna River. Most tags were released within the known distribution range for the species in the Susitna River drainage although tags released near the Tyone River were further upstream than Burbot had been previously documented (Delaney et al. 1981; Sautner and Stratton 1983).

Tracking data indicated that Burbot were most often located in, and dispersed throughout, mainstem habitats. In the Upper River, this was somewhat in contrast to historical catches which indicated that Burbot were more common near tributary mouths (Delaney et al. 1981; Sautner and Stratton 1983). Sautner and Stratton (1983) speculated that Burbot in the Upper River moved very little as recaptured fish were found at their original tagging location. Data from this study also indicates that movement by Burbot is minimal in most cases with the exception of some individuals undergoing a post-spawn migration. Results from this study mirror previous studies in the Middle and Lower River. Burbot were found primarily in the Susitna River and had short migrations during the post-spawn period (Jennings 1985; Schmidt et al. 1983). This study did not detect large distance spawning migrations as were reported by Schmidt and Estes (1983).

In the Upper River radio tagged behavior was somewhat different than observed in the 1980s but not drastically so. Telemetry data added to the previous knowledge base especially in regards to species distribution within the Susitna River, overwintering habitat, and spawning locations. Study results satisfied study objectives in the Upper River. In the Middle and Lower River study results were similar to those from previous studies. The strength of results from the Middle and Lower River is limited by the small number of tags released in this section of the river, especially the Middle River downstream from Devils Canyon.

6.3. Dolly Varden

Dolly Varden in the Upper River were generally not large enough for radio tagging and none were tagged in that section of the drainage. Of the 717 Dolly Varden collected and measured for length upstream of Impediment 3 during 2012-2014 FDA study efforts, only five individuals, less than one percent, all located in Fog Creek were of taggable size. Previous studies in the 1980s also encountered "stunted" Dolly Varden (Delaney et al. 1981; Sautner and Stratton 1983). In the Middle River, Dolly Varden were primarily detected near tributary mouths. Previous study in 1980s found similar results (Schmidt et al. 1983, 1984). In the Lower River, Dolly Varden were more abundant and spent the majority of the foraging period out of the mainstem. The detection of Dolly Varden overwintering in the mainstem of the Susitna River adds evidence to behavior that was suspected during the 1980s.

Due to Dolly Varden not being tagged in the Upper River study goals were not met for that section of the river, and they may not be attainable. In the Middle and Lower River radio tagged fish utilized similar habitats as used and were speculated to use in the 1980s. While tagged fish acted as expected the small tagging group was not adequate to sufficiently describe the population. Further study with emphasis on spawning locations and overwintering habitat are needed to meet study objectives in the Middle and Lower River.

6.4. Humpback Whitefish

Humpback Whitefish were tagged within the known distribution range for the species in the Susitna River drainage. Tagging occurred during the foraging period and in the section of the river where Humpback Whitefish would be expected to be present. It is of interest that individuals were captured with fishwheels (which capture fish migrating upstream) and a rotary screw trap (which capture downstream migrating fish) during a similar time period and in relatively close proximity (the lower end of the Middle River).

Other segments of the Fish Distribution and Abundance study also found low numbers of Humpback Whitefish within the Middle Susitna River. Locations of radio tagged fish were consistent with the distribution in historical data from the 1980s (Schmidt et al. 1983) as well as recent AEA research (AEA 2014c).

As no Humpback Whitefish were radio tagged in the Upper River study results did not meet study objectives for that portion of the drainage. Due to the small number of individuals tagged, in the Middle River, and the short tracking duration for all tagged individuals little information could be gathered for this species. Study results did not meet study objectives for the Middle and Lower River.

6.5. Lake Trout

Lake Trout tagged in Sally and Tsisi lakes were within the known distribution range for the species in the Susitna River drainage. Lake Trout were previously documented in Sally Lake in the 1980s (Sautner and Stratton 1983) as well as during recent AEA research (AEA 2014d). The presence of Lake Trout in Tsisi Lake was documented by AEA during the summer of 2014 (Study 9.5 SIR).

The lack of movement of radio tagged Lake Trout was similar to 1980s study which noted only minimal movements, of short distance, out of lakes. Habitats for seasons of interest (foraging, spawning, and overwintering) were contained within the lakes the fish were tagged in. As these results are consistent with historical data and the general knowledge of Lake Trout populations, the study results met the Study goals for the Upper River despite less than the goal of 30 tags being released. The identification of migratory corridors, holding areas, and the movements of fish relative to large-scale changes in water conditions are not applicable to Lake Trout and the lack of identification of them does not affect the efficiency of the study. No Lake Trout were tagged in the Middle and Lower River. Known Lake Trout populations in the Middle and Lower River are outside the Zone of Hydraulic Influence and likely would not be influenced by dam operations. No specific objectives were presented for Lake Trout in the Middle and Lower River in the Study Plan (RSP Section 9.6).

6.6. Longnose Sucker

Longnose Sucker were radio tagged throughout the Upper and Middle River. Most tags were released within the known distribution range for the species in the Susitna River drainage although tags released in and near the Tyone River were further upstream than Longnose Sucker had been previously documented.

Tracking data indicated that Longnose Sucker were most often located in mainstem habitats. This was in contrast to studies in the 1980s which produced higher catch rates in tributaries than the Susitna River. Some fish had a small annual home range and fidelity to summer foraging areas. Similarly, studies in the 1980s (Sautner and Stratton 1983) reported that all recaptured fish were found in the same location where they were originally released. Overwintering locations detected in the mainstem of the Susitna River upstream from the Watana Dam site add important information to our understanding of this species within the Susitna River drainage. Fish detected migrating downstream through Devils Canyon were likely injured fish that were not migrating downstream of their own accord. Downstream of Devils Canyon most detections occurred during

the foraging period in the Susitna River. Similar to studies in the 1980s, fish were concentrated near tributary mouths but also present throughout the mainstem (Schmidt et al. 1983, 1984). The detection of a Longnose Sucker, tagged in the Middle River, overwintering in the Chulitna River adds important information to the understanding of the habits of Longnose Sucker.

In the Upper River, radio tagged behavior was somewhat different than observed in the 1980s but not drastically so. Telemetry data added to the previous knowledge base especially in regards to species distribution, overwintering habitat, and migration patterns. No specific objectives were presented for Longnose Sucker in the Study Plan.

6.7. Northern Pike

Northern Pike were tagged within the known distribution range for the species in the Susitna River drainage. Tagging occurred during the foraging period and in the section of the river where Northern Pike were expected to be present. All detections of Northern Pike were within the known distribution range for the species. Telemetry results indicated no presence of Northern Pike in the Upper or Middle River.

None of the fish investigations conducted in the Upper River have documented Northern Pike and they are likely not present. As no Northern Pike have been detected in the Upper River, any goal to tag Northern Pike in the Upper River is unattainable. Due to the small number of individuals tagged, in the Lower River, limited information could be gathered for this species. Study results did not meet study objectives for the Middle and Lower River; however, those individuals tagged were monitored over a long period and did not make substantial movements from the area in which they were tagged. Previous studies in the Susitna River drainage concentrated on Northern Pike and provide supplemental information on the habits of the species in the Susitna River drainage (Rutz 1996, 1999; Ivey et al. 2009).

6.8. Rainbow Trout

Rainbow Trout were not captured or radio tagged in the Upper River. Previous and concurrent studies also did not encounter Rainbow Trout in the Upper River. In the Middle and Lower River, Rainbow Trout were primarily tagged in habitats they are known to occupy such as clearwater tributaries and tributary mouths.

Tracking data indicated a number of annual migration patterns throughout the population in the Middle and Lower River. Most fish foraged in and near clearwater tributaries before overwintering in the Susitna River. Similar to the 1980s, some Rainbow Trout resided in only one tributary during the foraging period while other Rainbow Trout utilized multiple tributaries (Schmidt et al. 1983, 1984). Some individuals used the same overwinter location in multiple years while other fish used a different location each winter. Individuals foraging in the same tributary would often overwinter in different locations. Some fish tagged in the Lower River moved into the Middle River while another individual overwintered in the Chulitna River. While previous studies have identified that Rainbow Trout in the Susitna River foraging in and near tributaries and overwintering in the Susitna River the data from this study adds detail to the general understanding of the annual migration of a Susitna River Rainbow Trout (Schmidt et al. 1984).

While many fish were detected during the spawning period it was observed that a number of Rainbow Trout "disappeared" during May tracking and it is likely that these fish were spawning outside of the normal survey range. Detections up the Chulitna River of two Rainbow Trout that foraged in Montana Creek lend credence to the idea that these fish may be spawning in the Chulitna River drainage during May. As the goal of the study is to identify spawning areas within the mainstem of the Susitna River, the lack of a confirmed spawning location outside of the mainstem does not hinder the meeting of the study goals.

Goals for tagging Rainbow Trout in the Upper River are not attainable as Rainbow Trout are not likely present. Rainbow Trout have not been detected in the Upper River in any fish sampling conducted by ADF&G or by AEA as part of the Susitna-Watana Hydro Project licensing studies. In the Middle and Lower River radio tagged fish utilized similar habitats as were used and were speculated as being used during the 1980s studies. Some additional variation within the population was detected. Results from this study confirm and expand upon the current knowledge of the Susitna River Rainbow Trout population. Study results satisfied study objectives for Rainbow Trout in the Middle and Lower Susitna River.

6.9. Round Whitefish

Round Whitefish were radio tagged throughout the Upper and Middle Susitna River as well as a portion of the Lower River. Most tags were released within the known distribution range for the species in the Susitna River drainage although tags released near the Tyone River were further upstream than Round Whitefish had been previously documented.

Tracking data indicated that Round Whitefish spent the majority of their time in the Susitna River and were found utilizing tributaries primarily during the foraging period. In the Upper River as well as the Middle and Lower River, limited numbers of tagged fish migrated up tributaries while most fish remained in the Susitna River for the entire time they were tracked. This was somewhat in contrast to reports from the 1980s which found that Round Whitefish were more common in tributaries and off channel habitat (Schmidt et al. 1984). Throughout the Susitna River, radio tagged fish had large migrations and often moved between river segments. Similarly, Sundet and Pechek (1985) observed Round Whitefish migrations of almost 70 miles in the 1980s. The large range of detections and general lack of concentrations of fish during the spawning period indicate that there are a number of spawning locations available to fish in the Upper River as well as the Middle and Lower River. Although Schmidt et al. 1984 indicated that Round Whitefish may spawn in tributaries no fish were detected in tributaries during the spawning period in this study.

In the Upper River, radio tagged behavior was somewhat different than observed in the 1980s but not drastically so. Telemetry data added to the previous knowledge base especially in regards to species distribution within the Susitna River, overwintering habitat, and spawning locations. Specifically spawning locations were dispersed throughout the Susitna River from Jay Creek downstream to Deadman Creek and overwintering was dispersed throughout the Susitna River from Jay Creek downstream to Fog Creek. Study results satisfied study objectives for Round Whitefish in the Upper River. In the Middle and Lower River study results were similar to those from previous studies regarding fish behavior but were dissimilar in regards to habitat utilization. Spawning locations within the Middle Susitna River were likely near the mouths of Indian River, Gold Creek, and 4th of July Creek. Other possible spawning locations included Slough 9 and the

mouth of the Talkeetna River. Overwintering locations were located throughout the Middle River downstream of Indian River and in the Lower River near the mouth of the Talkeetna River. Although study results satisfied study objectives in the Middle River downstream of Devils Canyon additional information is needed for fish in the Middle River upstream of Devils Canyon and the Lower River.

7. CONCLUSION

7.1. Upper River

Study objectives were met in the Upper River for Arctic Grayling, Burbot, and Round Whitefish. Longnose Sucker and Lake Trout were the other species tagged in the Upper River, although no specific objectives were presented for those species in the Study Plan. If additional tagging of Lake Trout is performed, Sally Lake (in the Watana Creek drainage) may be a priority over other areas due to its location within the Inundation Zone.

Dolly Varden in the Upper River were generally not of sufficient size for the radio tags used in this study. To meet objectives, it would be necessary to use smaller tags which have a shorter battery life and target fish near spawning, overwintering and foraging time period. Tagging in early summer would provide data on movements to foraging areas and tagging in late summer or early fall could provide data on spawning locations and movements to overwintering locations. Dolly Varden are most numerous in Watana and Jay creeks (and Fog Creek in the Middle River upstream of Devils Canyon) and concentrating efforts in those streams would likely be the most productive. Fixed stations located on the tributaries at the upper extent of the Inundation Zone would provide data on movement into and out of the reservoir area while aerial surveys would provide more specific information on locations utilized by fish.

It is likely not feasible to meet study objectives in the Upper River for Humpback Whitefish, Northern Pike, or Rainbow Trout. Humpback Whitefish, while present in the Upper River, do not occur in sufficient numbers to meet tagging goals. No Northern Pike or Rainbow Trout have been documented in the Upper River, despite intensive sampling.

7.2. Middle and Lower River

Additional information is needed to further define spawning and overwintering areas for Arctic Grayling downstream of Devils Canyon. During the spawning period a number of Arctic Grayling were not located in the areas commonly surveyed and did not reappear until later surveys. While one of the objectives of the study was to investigate spawning in the mainstem of the Susitna River additional effort to locate where fish are spawning outside of the mainstem of the Susitna River may be in order. Due to the small sample size (15 tags released downstream of Devils Canyon) there was not enough information to define overwintering areas downstream of Devils Canyon.

An additional 15 Arctic Grayling should be tagged downstream of Devils Canyon during September with tags that have a battery life of 250 days or more. This would allow tracking through the overwintering and spawning periods. Based on observations in the Upper River, Arctic Grayling began spawning migrations before the ice was off of the Susitna River which

necessitates future tagging downstream of Devils Canyon in the fall prior to spawning with longer life tags. Tags should be tracked with aerial surveys. Meeting the objectives in the Middle and Lower River is feasible.

Additional information is needed to further define foraging, spawning and overwintering areas for Burbot downstream of Devils Canyon. An additional 20 tags should be released downstream of Devils Canyon and tracked with aerial surveys. Meeting the objectives in the Middle and Lower River is feasible.

Dolly Varden of appropriate size were not encountered in sufficient numbers to meet the objectives of this study. To meet the tagging goal it would be necessary to concentrate tags in areas of localized Dolly Varden abundance (i.e., Talkeetna River). An additional 25 tags should be released downstream of Devils Canyon and tracked with aerial surveys. Meeting the objectives in the Middle and Lower River is difficult but potentially feasible.

Humpback Whitefish of appropriate size were not encountered in sufficient numbers to meet the objectives of this study. An additional 30 tags should be released downstream of Devils Canyon and tracked with aerial surveys. Meeting the objectives in the Middle and Lower River is difficult and may not be feasible.

Lake Trout were not encountered or radio tagged in the Middle and Lower River. Populations of Lake Trout are located outside the zone of hydrologic influence and were not targeted for tagging. Additionally, no specific objectives were presented for Lake Trout in the Study Plan. Due to Lake Trout not inhabiting the zone of hydrologic influence in the Middle and Lower River and a lack of nexus with the Project, additional effort for this species is not deemed necessary. If additional tagging was required, available tagging populations include Miami Lake (Indian River drainage) and Larson Lake (Talkeetna River drainage), both of which are located many miles outside of the zone of hydrologic influence and beyond potential Project impacts.

Additional information is needed to further define foraging, spawning and overwintering areas for Longnose Sucker in the Middle and Lower River. An additional 30 tags should be released, including a minimum of five upstream of Devils Canyon, and tracked with aerial surveys. No specific objectives were presented for Longnose Sucker in the Study Plan.

Northern Pike objectives were not met due to the small sample size (five tags released out of a goal of 30). Releasing the additional 25 tags to meet the tagging goal is feasible although it may be of questionable utility. Consistent with Rutz (1999), this study found that Northern Pike were observed to remain in the Lower River for the duration of the tracking. If additional tagging is done, locations closer to the Middle River should be a priority to help define the upstream distribution of the species. Meeting the objectives is feasible.

Study objectives were met in the Middle and Lower River for Rainbow Trout. During the spawning period a number of Rainbow Trout were not located in the areas commonly surveyed and did not reappear until later surveys during the foraging season. While one of the objectives of the study was to investigate spawning in the mainstem of the Susitna River additional effort to locate where fish are spawning outside of the mainstem of the Susitna River may be of interest.

Additional information is needed to further define foraging, spawning and overwintering areas for Round Whitefish. An additional 15 tags should be released, including a minimum of five upstream of Devils Canyon, and tracked with aerial surveys. Meeting the objectives in the Middle and Lower River is feasible.

8. REFERENCES

Aebischer, N. J., Robertson, P. A., and Kenward, R. E. 1993. Compositional Analysis of Habitat Use From Animal Radio-Tracking Data. Ecology. 74: 1313–1325.

Alaska Energy Authority (AEA). 2012. Revised Study Plan. Susitna-Watana Hydroelectric Project, FERC Project No. 14241 Submittal: December 14, 2012. http://www.susitna-watanahydro.org/study-plan.

Alaska Energy Authority (AEA). 2013. Fish Distribution and Abundance Implementation Plan. Susitna-Watana Hydroelectric Project (FERC No. 14241). Prepared by R2 Resource Consultants, Inc., LGL Alaska Research Associates, Inc., Golder Associates Inc., and HDR, Inc. March 2013.

Alaska Energy Authority (AEA). 2014a. Study of Fish Passage Feasibility at Watana Dam Initial Study Report. Susitna-Watana Hydroelectric Project (FERC No. 14241). Prepared by R2 Resource Consultants, Inc., June 2014.

Alaska Energy Authority (AEA). 2014b. Fish and Aquatics Instream Flow Initial Study Report. Susitna-Watana Hydroelectric Project (FERC No. 14241). Prepared by R2 Resource Consultants, Inc., June 2014.

Alaska Energy Authority (AEA). 2014c. Study of Fish Distribution and Abundance in the Middle and Lower Susitna River Initial Study Report. Susitna-Watana Hydroelectric Project (FERC No. 14241). Prepared by R2 Resource Consultants, Inc., LGL Alaska Research Associates, Inc., Golder Associates Inc., and HDR, Inc. June 2014.

Alaska Energy Authority (AEA). 2014d. Study of Fish Distribution and Abundance in the Upper Susitna River Initial Study Report. Susitna-Watana Hydroelectric Project (FERC No. 14241). Prepared by R2 Resource Consultants, Inc., June 2014.

Alaska Energy Authority (AEA). 2015a. Study of Fish Distribution and Abundance in the Middle and Lower Susitna River 2014-201 Study Implementation Report. Susitna-Watana Hydroelectric Project (FERC No. 14241). Prepared by R2 Resource Consultants, Inc., LGL Alaska Research Associates, Inc., Golder Associates Inc., and HDR, Inc. November, 2015.

Alaska Energy Authority (AEA). 2015b. Study of Fish Distribution and Abundance in the Upper Susitna River 2014-2015 Study Implementation Report. Susitna-Watana Hydroelectric Project (FERC No. 14241). Prepared by R2 Resource Consultants, Inc., November, 2015.

Delaney, K., D. Crawford, L. Dugan, S. Hale, K Kuntz, B. Marshall, J. Mauney, J. Quinn, K. Roth, P Suchanek, R. Sundet, and M. Stratton. 1981. Juvenile Anadromous Fish Study on the Lower Susitna River. Alaska Department of Fish and Game, Susitna Hydro Aquatic Studies, Anchorage, Alaska 200 pp.

English, K.K., D. Robichaud, and P. Wainwright. 2012. Database Management and "Real-Time" Data Analysis Systems for Fish Telemetry Studies. Pages 491-504 in N.S. Adams, J.W.

Beeman, and J.H. Eiler, editors. Telemetry Techniques: A User Guide for Fisheries Research. American Fisheries Society, Bethesda, Maryland.

Federal Energy Regulatory Commission (FERC). 2013. Study Plan Determination on 14 remaining studies for the Susitna-Watana Hydroelectric Project. Susitna-Watana Hydroelectric Project, FERC No. P-14241. April 1, 2013. http://elibrary.FERC.gov/idmws/file_list.asp?accession_num=20130401-3022.

Garton, E. O., M. J. Wisdom, F A. Leban, and B. K. Johnson. 2001. Experimental design for radiotelemetry studies. Pages 16-42 273 in J. J. Millspaugh and J. M. Marzluff, editors. Radio tracking and animal populations. Academic Press, San Diego, California, USA.

Gillingham, M.P. and K.L. Parker. 2008. The Importance of Individual Variation in Defining Habitat Selection by Moose in Northern British Columbia. ALCES. 44:7-20.

Gryska, A. 2006. Vulnerability of Arctic Grayling to the Brushkana Creek Sport Fishery. Alaska Department of Fish and Game. Anchorage, Alaska. 44 pp.

Harrison, P.M., L.F.G. Gutowsky, E.G. Martins, D.A. Patterson, S.J. Cooke and M. Power. 2016. Burbot and large hydropower in North America: Benefits, threats, and research needs for mitigation. Fisheries Management and Ecology.

Ivey, S., C. Brockman, and D. Rutz. 2009. Area management report for the recreational fisheries of Northern Cook Inlet, 2005 and 2006. Fishery Management Report No 09-27. Alaska Department of Fish and Game. Anchorage, Alaska.

Jennings, T.R. 1985. Fish Resources and Habitats in the Middle Susitna River. Woodward Clyde Consultants and Entrix. Final Report to Alaska Power Authority. 175 pp.

LGL Alaska Research Associates, Inc. (LGL). 2014a. Distribution of Fish Radio-Tagged in the Upper Susitna River, 2013. Susitna-Watana Hydroelectric Project, FERC No. P-14241 Submittal: June 3, 2014, Initial Study Report, Study 9.6, Part A, Appendix A. Prepared for Alaska Energy Authority, Anchorage, Alaska. http://www.susitna-watanahydro.org/wp-content/uploads/2014/05/09.05_FDAUP_ISR_PartA_2_of_2_Apps.pdf

LGL Alaska Research Associates, Inc. (LGL). 2014b. Distribution of Fish Radio-Tagged in the Middle and Lower Susitna River, 2013. Susitna-Watana Hydroelectric Project, FERC No. P-14241 Submittal: June 3, 2014, Initial Study Report, Study 9.6, Part A, Appendix B. Prepared for Alaska Energy Authority, Anchorage, Alaska. http://www.susitna-watanahydro.org/wp-content/uploads/2014/05/09.06_FDAML_ISR_PartA_3_of_5_App_B.pdf

Manly, B.F.J., L.L. McDonald, D.L. Thomas, T.L. McDonald, and W.P. Erickson. 2002. Resource selection by animals: statistical design and analysis for field studies. Kluwer Academic Publishers, Boston.

O'Connor, R.R. and F.J. Rahel. 2009. A patch perspective on summer habitat use by brown trout Salmo Trutta in a high plains stream in Wyoming, USA. Ecology of Freshwater Fish.

Paragamian, V.L. and V.D Wakkinen. 2008. Seasonal movement of Burbot in relation to temperature and discharge in the Kootenai River, Idaho, USA and British Columbia, Canada. In: V.L. Paragamian and D.H. Bennett (eds) Burbot: Ecology, Management and Culture. Bethesda, MD: American Fisheries Society, pp 55–77.

R2 Resource Consultants and LGL Alaska Research Associates, Inc. (R2 and LGL). 2014a. Winter Sampling Report. Susitna-Watana Hydroelectric Project, FERC No. P-14241 Submittal: June 3, 2014, Initial Study Report, Study 9.6, Part A, Appendix C. Prepared for Alaska Energy Authority, Anchorage, Alaska. http://www.susitna-watanahydro.org/wp-content/uploads/2014/05/09.06_FDAML_ISR_PartA_4_of_5_App_C.pdf

R2 Resource Consultants and LGL Alaska Research Associates, Inc. (R2 and LGL). 2014b. 2013-2014 Winter Fish Study Technical Memorandum. Susitna-Watana Hydroelectric Project, FERC No. P-14241 Submittal: September, 2014, Prepared for Alaska Energy Authority, Anchorage, Alaska. http://www.susitna-watanahydro.org/wp-content/uploads/2014/09/09.06_FDAML_Winter_TM.pdf

Rogers, K.B. and G. C. White. 2007. Analysis of movement and habitat use from telemetry data. Pages 625-676 *in* C.S. Guy and M.L. Brown, editors. Analysis and interpretation of freshwater fisheries data. American Fisheries Society, Bethesda, Maryland.

Rutz, D.S. 1996. Seasonal movements, age and size statistics, and food habits of Northern Pike in Upper Cook Inlet during 1994 and 1995. Alaska Department of Fish and Game. Anchorage, Alaska.

Rutz, D.S. 1999. Movements, food availability and stomach contents of Northern Pike in selected Susitna River drainages, 1996-1997. Alaska Department of Fish and Game Fishery Data Series No. 99-5. Anchorage, Alaska. 78 pp.

Sautner, J., and M. Stratton. 1983. Upper Susitna River Impoundment Studies 1982. Alaska Department of Fish and Game. Anchorage, Alaska. 220 pp.

Schmidt, D. and C. Estes. 1983. Winter aquatic studies (October 1982 - May 1983). Phase II Data Report, Alaska Department of Fish and Game Susitna Hydro Aquatic Studies. Prepared for Alaska Power Authority, Anchorage, Alaska. 269 pp. APA Document # 397.

Schmidt, D., S. Hale, D. Crawford, and P. Suchanek. 1983. Resident and Juvenile Anadromous Fish Studies on the Susitna River Below Devil Canyon, 1982. Prepared by Alaska Department of Fish and Game for the Alaska Power Authority. 303 pp.

Schmidt, D.C., S.S. Hale, D.L. Crawford, and P.M. Suchanek. 1984. Resident and juvenile anadromous fish investigations (May - October 1983). Prepared for the Alaska Power Authority. Alaska Department of Fish and Game Susitna Hydro Aquatic Studies Anchorage, Alaska. 458 pp.

Sundet, R.L., and S.D. Pechek. 1985. Resident Fish Distribution and Life History in the Susitna River Below Devil Canyon. Pages 97 In: Schmidt, D.C., S.S. Hale, and D.L. Crawford. (eds.)

Resident and Juvenile Anadromous Fish Investigations (May - October 1984). Prepared by Alaska Department of Fish and Game. Prepared for Alaska Power Authority, Anchorage, AK.

9. TABLES

Table 4.1-1. Tagging goals for each species in the Upper Susitna River, 2013-2014.

Species	Tag Target	Tags Deployed	Status	Notes
Arctic Grayling	30	111	Goal met	
Burbot	30	40	Goal met	
Dolly Varden	30	0		Taggable sized fish in low abundance
Humpback Whitefish	30	0		Taggable sized fish in low abundance
Lake Trout	30	12		Taggable sized fish are only found in lakes
Longnose Sucker	30	44	Goal met	
Northern Pike	30	0		Not present in the Upper River
Rainbow Trout	30	0		Not present in the Upper River
Round Whitefish	30	41	Goal met	

Table 4.1-2. Tags-at large in the Upper and Middle/Lower Susitna River, by species, at the end of each month of the study, 2013-2015.

Species	Tagging River Segment	# Tagged	2013							2014													2015					
			June	July	August	September	October	November	December	January	February	March	April	May	June	July	August	September	October	November	December	January	February	March	April	May	June
Arctic Grayling	Upper River	111	0	29	24	44	40	35	29	25	23	22	21	17	68	50	43	40	35	31	28	27	23	23	22	20	17
	Middle/Lower River	42	11	25	18	19	18	15	12	9	9	9	9	8	14	10	9	9	8	8	7	7	7	7	7	7	6
	Total	153	11	54	42	63	58	50	41	34	32	31	30	25	82	60	52	49	43	39	35	34	30	30	29	27	23
Burbot	Upper River	40	0	0	0	6	6	6	6	5	5	5	4	4	16	14	13	29	25	23	20	20	20	19	19	19	17
	Middle/Lower River	14	2	2	6	7	5	4	4	3	3	3	2	2	2	1	1	6	6	5	5	4	4	4	4	4	3
	Total	54	2	2	6	13	11	10	10	8	8	8	6	6	18	15	14	35	31	28	25	24	24	23	23	23	20
Dolly Varden	Middle/Lower River	9	1	7	8	6	5	5	3	2	2	2	2	2	2	1	0	0	0	0	0	0	0	0	0	0	0
Humpback Whitefish	Middle/Lower River	7	3	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lake Trout	Upper River	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	12	12	11	11	11	11	11	11	11
Longnose Sucker	Upper River	44	0	5	3	6	5	4	3	3	3	3	3	3	19	17	15	27	25	22	17	15	15	14	14	13	13
	Middle/Lower River	28	12	14	13	7	6	6	5	4	3	3	3	2	1	1	0	0	0	0	0	0	0	0	0	0	0
	Total	72	12	19	16	13	11	10	8	7	6	6	6	5	20	18	15	27	25	22	17	15	15	14	14	13	13
Northern Pike	Middle/Lower River	5	0	0	5	5	5	5	5	4	4	4	3	3	3	3	3	2	2	2	2	2	2	2	2	1	0
Rainbow Trout	Middle/Lower River	44	11	28	23	28	24	23	22	21	21	21	21	18	17	16	13	11	10	10	10	10	10	10	9	9	7
Round Whitefish	Upper River	41	0	0	0	18	18	16	11	7	6	5	5	4	11	11	10	25	23	19	18	18	17	16	16	16	16
	Middle/Lower River	21	10	13	11	15	11	11	10	9	9	8	7	5	3	3	1	1	1	1	1	1	1	1	1	1	0
	Total	62	10	13	11	33	29	27	21	16	15	13	12	9	14	14	11	26	24	20	19	19	18	17	17	17	16
All Species Total		418	50	127	112	162	143	130	110	92	88	85	80	68	156	127	108	162	147	133	119	115	110	107	105	101	90

Table 4.1-3. Tagging goals for each species in the Middle and Lower Susitna River, 2013-2014.

Species	Tag Target	Tags Deployed	Status	Notes
Arctic Grayling	30	42	Goal met	
Burbot	30	14	Goal not met	The goal is achievable
Dolly Varden	30	9	Goal not met	Taggable sized fish in low abundance in the Susitna River
Humpback Whitefish	30	7	Goal not met	Taggable sized fish in low abundance in the Middle River
Lake Trout	30	0	Goal not met	Taggable sized fish are only found in lakes
Longnose Sucker	30	28	Goal not met	The goal is achievable
Northern Pike	30	5	Goal not met	The goal is achievable
Rainbow Trout	30	44	Goal met	
Round Whitefish	30	21	Goal not met	The goal is achievable

Table 4.1-4. Distribution of tags by release locations in the Middle and Lower Susitna River 2013-2014.

Species	Middle River - Upstream of Devils Canyon	Middle River - Downstream of Devils Canyon	Lower River	Total
Arctic Grayling	27	15	0	42
Burbot	5	3	6	14
Dolly Varden	0	3	6	9
Humpback Whitefish	0	7	0	7
Lake Trout	0	0	0	0
Longnose Sucker	0	25	3	28
Northern Pike	0	0	5	5
Rainbow Trout	0	23	21	44
Round Whitefish	0	20	1	21

Table 4.1-5. Locations and antenna orientations of fixed telemetry stations in the Upper Susitna River drainage.

Site	Receiver No.	Susitna River Mile	Latitude	Longitude	River Bank	Antenna	Antenna Orientation
Watana Dam Site	57	187	62.823420	-148.534770	Right	1	Downstream Susitna River
						2	Upstream Susitna River
Deadman Creek	58	189	62.826000	-148.389700	Right	1	Downstream Susitna River
						2	Upstream Susitna River
Watana Creek	59	197	62.829870	-148.255780	Right	1	Downstream Susitna River
						2	Upstream Susitna River
						3	Up Watana Creek
Kosina Creek	60	209	62.783890	-147.938020	Right	1	Downstream Susitna River
						2	Upstream Susitna River
						3	Up Kosina Creek
Oshetna River	65	235	62.639970	-147.383480	Left	1	Downstream Susitna River
						2	Upstream Susitna River
						3	Up Oshetna River

Table 4.1-6. Locations and antenna orientations of fixed telemetry stations in the Middle and Lower Susitna River drainage.

Site	Receiver No.	Susitna River Mile	Latitude	Longitude	River Bank	Antenna	Antenna Orientation
Montana Creek	1	-	62.105958	-150.055805	-	1	Downstream Montana Creek
						2	Upstream Montana Creek
Whiskers Creek	2	104	62.374681	-150.169019	Right	1	Downstream Susitna River
						2	Upstream Susitna River
						3	Up Whiskers Creek
Lane Creek	5,10	117	62.527920	-150.114070	Right	1	Downstream Susitna River
						2	Upstream Susitna River
						3	Across Susitna River
Gateway	15	130	62.676450	-149.893030	Right	1	Downstream Susitna River
						2	Upstream Susitna River
4th of July	17	134	62.715170	-149.805410	Right	1	Downstream Susitna River
						2	Upstream Susitna River
						3	Up 4th of July Creek
Indian River	25	142	62.785300	-149.657930	Right	1	Downstream Susitna River
						2	Upstream Susitna River
						3	Up Indian River
Upper Indian	27	-	62.807500	-149.661952	-	1	Above Weir
Powerline	31	145	62.818950	-149.576540	Right	1	Downstream Susitna River
						2	Upstream Susitna River
Cheechako	40	157	62.807940	-149.253920	Left	1	Downstream Susitna River
						2	Upstream Susitna River
Chinook Creek	45	160	62.801760	-149.160790	Left	1	Downstream Susitna River
						2	Upstream Susitna River
Devils Island	51	167	62.809260	-149.002680	Mainstem Island	1	Downstream Susitna River
						2	Upstream Susitna River

Table 4.1-7. Monitoring efficiency (percent operational) of fixed-station receivers in the Upper Susitna River, by week. Percentages were calculated as the number of hours of recorded receiver activity divided by the number of hours for which it was deployed, summed by week; "nd" = 'not deployed.' Receivers were considered active in a given hour if at least one fish detection, beacon-tag hit, or noise event was recorded during the hour.

Week	Watana Dam Site	Deadman Creek	Watana Creek	Kosina Creek	Oshetna Creek
2013					
6/3 - 6/9	nd	nd	nd	nd	nd
6/10 - 6/16	nd	nd	nd	nd	nd
6/17 - 6/23	nd	nd	nd	nd	nd
6/24 - 6/30	nd	nd	nd	100	4
7/1 - 7/7	nd	100	nd	100	0
7/8 - 7/14	nd	100	nd	100	34
7/15 - 7/21	nd	100	nd	100	100
7/22 - 7/28	nd	100	nd	100	100
7/29 - 8/4	nd	100	nd	37	100
8/5 - 8/11	nd	100	nd	0	100
8/12 - 8/18	nd	100	nd	17	100
8/19 - 8/25	nd	100	nd	92	100
8/26 - 9/1	nd	100	nd	100	100
9/2 - 9/8	nd	100	nd	100	100
9/9 - 9/15	nd	100	nd	100	100
9/16 - 9/22	nd	nd	nd	100	100
9/23 - 9/29	nd	nd	nd	100	100
9/30 - 10/6	nd	nd	nd	100	100
10/7 - 10/13	nd	nd	nd	100	100
10/14 - 10/20	nd	nd	nd	100	100
10/21 - 10/27	nd	nd	nd	100	100
10/28 - 11/3	nd	nd	nd	100	100
11/4 - 11/10	nd	nd	nd	100	100
11/11 - 11/17	nd	nd	nd	100	100
11/18 - 11/24	nd	nd	nd	nd	nd
11/25 - 12/1	nd	nd	nd	nd	nd
12/2 - 12/8	nd	nd	nd	nd	nd
12/9 - 12/15	nd	nd	nd	nd	nd

Table 4.1-7. Continued.

Week	Watana Dam Site	Deadman Creek	Watana Creek	Kosina Creek	Oshetna Creek
2014					
4/28 - 5/4	nd	nd	nd	100	nd
5/5 - 5/11	nd	nd	nd	100	nd
5/12 - 5/18	nd	nd	nd	94	nd
5/19 - 5/25	nd	nd	nd	78	100
5/26 - 6/1	nd	nd	nd	100	100
6/2 - 6/8	nd	nd	nd	100	100
6/9 - 6/15	nd	nd	62	100	100
6/16 - 6/22	nd	nd	91	100	100
6/23 - 6/29	nd	nd	24	100	100
6/30 - 7/6	nd	nd	79	100	100
7/7 - 7/13	100	nd	100	100	100
7/14 - 7/20	100	nd	100	100	100
7/21 - 7/27	100	nd	100	100	100
7/28 - 8/3	100	nd	100	100	100
8/4 - 8/10	100	nd	100	100	100
8/11 - 8/17	100	nd	100	100	100
8/18 - 8/24	100	nd	100	100	100
8/25 - 8/31	100	nd	100	100	100
9/1 - 9/7	100	nd	100	100	100
9/8 - 9/14	nd	nd	100	100	100
9/15 - 9/21	nd	nd	100	100	100
9/22 - 9/28	nd	nd	100	100	100
9/29 - 10/5	nd	nd	100	100	100
10/6 - 10/12	nd	nd	100	100	100
10/13 - 10/19	nd	nd	nd	99	nd
10/20 - 10/26	nd	nd	nd	100	nd
10/27 - 11/2	nd	nd	nd	100	nd
11/3 - 11/9	nd	nd	nd	100	nd
11/10 - 11/16	nd	nd	nd	nd	nd
11/17 - 11/23	nd	nd	nd	nd	nd
11/24 - 11/30	nd	nd	nd	nd	nd
12/1 - 12/7	nd	nd	nd	nd	nd

Key: light grey: Receiver not scanning; dark gray: Low power/dead battery; black: station damaged by wildlife.

Table 4.1-8. Monitoring efficiency (percent operational) of fixed-station receivers in the Middle and Lower Susitna River, by week. Percentages were calculated as the number of hours of recorded receiver activity divided by the number of hours for which it was deployed, summed by week; "nd" = 'not deployed.' Receivers were considered active in a given hour if at least one fish detection, beacon-tag hit, or noise event was recorded during the hour.

Week	Montana	Whiskers	Lane Station (Rx 1)	Lane Station (Rx 2)	Gateway	Fourth of July	Indian River	Upper Indian	Powerline	Cheechako	Chinook	Devils Station (resident)
2013												
6/3 - 6/9	100	100	100	100	100	100	100	nd	nd	nd	nd	nd
6/10 - 6/16	100	100	100	100	100	100	100	nd	100	nd	nd	nd
6/17 - 6/23	100	100	100	100	100	100	100	nd	100	nd	nd	nd
6/24 - 6/30	100	100	100	100	100	39	100	100	38	nd	nd	nd
7/1 - 7/7	100	100	100	100	100	91	100	100	92	nd	nd	nd
7/8 - 7/14	100	100	100	100	100	100	100	100	68	nd	nd	nd
7/15 - 7/21	100	100	100	100	100	100	100	100	35	nd	nd	100
7/22 - 7/28	100	100	100	100	100	100	100	100	79	nd	nd	100
7/29 - 8/4	100	100	100	100	100	100	100	100	100	nd	nd	100
8/5 - 8/11	100	100	100	100	100	100	95	100	100	nd	nd	100
8/12 - 8/18	100	100	100	100	100	100	43	100	100	nd	nd	100
8/19 - 8/25	100	100	100	100	100	100	100	100	100	nd	nd	100
8/26 - 9/1	100	100	100	100	100	100	100	100	100	nd	nd	100
9/2 - 9/8	100	100	100	100	100	100	100	nd	36	nd	nd	100
9/9 - 9/15	100	100	100	100	100	100	100	nd	64	nd	nd	100
9/16 - 9/22	100	100	100	100	100	100	100	nd	100	nd	nd	100
9/23 - 9/29	100	100	100	100	nd	nd	100	nd	nd	nd	nd	100
9/30 - 10/6	100	95	nd	nd	nd	nd	100	nd	nd	nd	nd	100
10/7 - 10/13	100	100	nd	nd	nd	nd	100	nd	nd	nd	nd	100
10/14 - 10/20	100	100	nd	nd	nd	nd	100	nd	nd	nd	nd	100
10/21 - 10/27	100	100	nd	nd	nd	nd	100	nd	nd	nd	nd	100
10/28 - 11/3	nd	100	nd	nd	nd	nd	100	nd	nd	nd	nd	100
11/4 - 11/10	nd	100	nd	nd	nd	nd	100	nd	nd	nd	nd	100
11/11 - 11/17	nd	100	nd	nd	nd	nd	100	nd	nd	nd	nd	100
11/18 - 11/24	nd	100	nd	nd	nd	nd	100	nd	nd	nd	nd	nd
11/25 - 12/1	nd	100	nd	nd	nd	nd	100	nd	nd	nd	nd	nd
12/2 - 12/8	nd	100	nd	nd	nd	nd	100	nd	nd	nd	nd	nd
12/9 - 12/15	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd

Table 4.1-8. Continued.

Week	Montana	Whiskers	Lane Station (Rx 1)	Lane Station (Rx 2)	Gateway	Fourth of July	Indian River	Upper Indian	Powerline	Cheechako	Chinook	Devils Station (resident)
2014												
4/28 - 5/4	nd	nd	nd	nd	nd	nd	100	nd	nd	nd	nd	nd
5/5 - 5/11	nd	nd	nd	nd	nd	nd	100	nd	nd	nd	nd	nd
5/12 - 5/18	nd	nd	nd	nd	nd	nd	100	nd	nd	nd	nd	nd
5/19 - 5/25	nd	nd	100	100	nd	nd	100	nd	nd	nd	nd	nd
5/26 - 6/1	nd	nd	100	100	nd	nd	100	nd	nd	nd	nd	nd
6/2 - 6/8	nd	nd	99	100	nd	nd	100	nd	nd	nd	nd	nd
6/9 - 6/15	nd	nd	100	100	100	nd	100	nd	nd	100	100	32
6/16 - 6/22	nd	nd	100	100	100	nd	100	56	nd	100	100	93
6/23 - 6/29	nd	nd	100	9	100	nd	100	46	nd	100	100	100
6/30 - 7/6	nd	nd	100	94	58	nd	100	nd	nd	100	100	100
7/7 - 7/13	nd	nd	100	100	100	nd	100	nd	nd	100	100	100
7/14 - 7/20	nd	nd	100	100	100	nd	100	nd	nd	100	100	100
7/21 - 7/27	nd	nd	100	100	100	nd	100	nd	nd	100	100	100
7/28 - 8/3	nd	nd	100	100	100	nd	100	nd	nd	100	100	74
8/4 - 8/10	nd	nd	100	100	100	nd	100	nd	nd	100	100	100
8/11 - 8/17	nd	nd	100	100	100	nd	100	nd	nd	100	100	100
8/18 - 8/24	nd	nd	100	100	100	nd	100	nd	nd	100	100	100
8/25 - 8/31	nd	nd	100	100	100	nd	100	nd	nd	100	100	100
9/1 - 9/7	nd	nd	100	100	100	nd	100	nd	nd	100	100	100
9/8 - 9/14	nd	nd	100	100	100	nd	100	nd	nd	100	100	100
9/15 - 9/21	nd	nd	100	100	100	nd	100	nd	nd	100	100	100
9/22 - 9/28	nd	nd	100	100	100	nd	100	nd	nd	100	100	100
9/29 - 10/5	nd	nd	100	100	nd	nd	100	nd	nd	100	100	100
10/6 - 10/12	nd	nd	nd	nd	nd	nd	100	nd	nd	100	nd	100
10/13 - 10/19	nd	nd	nd	nd	nd	nd	100	nd	nd	nd	nd	100
10/20 - 10/26	nd	nd	nd	nd	nd	nd	100	nd	nd	nd	nd	100
10/27 - 11/2	nd	nd	nd	nd	nd	nd	100	nd	nd	nd	nd	100
11/3 - 11/9	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	88
11/10 - 11/16	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	65
11/17 - 11/23	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	95
11/24 - 11/30	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	8
12/1 - 12/7	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0

Key: light grey: Receiver not scanning; dark grey: Low power/dead battery; black: Full memory caused loss of data

Table 4.2-1. Tributaries and project river miles used for defining tributary confluence areas for fish-habitat use. Aerial Survey Zone indicates whether the tributary was flown on a regular basis as an independent zone.

Tributary	Tributary Mouth Habitat Extent (PRM)			Aerial Survey Zone
	Lower Extent	Tributary Mouth	Upper Extent	
Lower River PRM 32.3 - 102.4				
Yentna River	32.1	32.4	32.6	x
Fish Creek	33.8	34.1	34.3	x
Deshka River	44.6	44.9	45.1	x
Willow Creek	53.3	53.6	53.8	x
Kashwitna River	64.4	64.7	64.9	x
Caswell Creek	67.1	67.4	67.6	x
Sheep Creek	69.8	70.1	70.3	x
Goose Creek (LR)	75.9	76.2	76.4	x
Montana Creek	80.6	80.9	81.1	x
Rabideux Creek	87.3	87.6	87.8	x
Sunshine Creek	87.8	88.1	88.3	x
Birch Creek	93.2	93.5	93.7	x
Talkeetna River	100.2	100.5	100.7	x
Chulitna River	101.9	102.2	102.4	x
Middle River PRM 102.4 - 187.1				
Whiskers Creek	104.8	105.1	105.3	x
Chase Creek	110.2	110.5	110.7	x
Slash & Gash Creeks	114.7	115	115.2	
Lane Creek	116.9	117.2	117.4	x
Fifth of July Creek	127	127.3	127.5	x
Sherman Creek	133.8	134.1	134.3	
Fourth of July Creek	134	134.3	134.5	x
Gold Creek	139.8	140.1	140.3	x
Indian River	141.8	142.1	142.3	x
Jack Long Creek	148	148.3	148.5	x
Portage Creek	152	152.3	152.5	x
Cheechako Creek	155.6	155.9	156.1	x
Chinook Creek	160.2	160.5	160.7	x
Devil Creek	164.5	164.8	165	x
Unnamed 173.8	173.5	173.8	174	
Fog Creek	179	179.3	179.5	x
Unnamed 184.0	183.7	184	184.2	
Tsusena Creek	184.3	184.6	184.8	x
Upper River PRM 187.1 - 235.1				
Deadman Creek	189.1	189.4	189.6	x
Unnamed 194.8	194.5	194.8	195	x
Watana Creek	196.6	196.9	197.1	x
Unnamed 197.7	197.4	197.7	197.9	
Unnamed 203.4	203.1	203.4	203.6	
Unnamed 204.5	204	204.3	204.5	
Unnamed 206.3	206	206.3	206.5	
Kosina Creek	208.8	209.1	209.3	x
Jay Creek	210.7	211	211.2	x
Goose Creek (UR)	232.5	232.8	233	x
Oshetna River	234.8	235.1	235.3	x
Susitna River Upstream of Fish Distribution and Abundance Study Area				
Tyone River	247	247.3	247.5	x
Clearwater Creek	266.3	266.6	266.8	x

Table 4.2-2. Dates used for seasonal analysis. Foraging ended and overwintering began in November in 2013 and October in 2014. Spawning dates are from Study 8.5 ISR Appendix H with the exception of Arctic Grayling and Lake Trout which are based on observations from this study and Northern Pike which is based on Rutz (1996). The end of foraging season and beginning of overwinter was determined by water temperatures dropping below 2° C and was variable between years.

Activity	Species	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
Overwintering																									
Foraging																									
Spawning	Arctic Grayling																								
	Burbot																								
	Dolly Varden																								
	Humpback Whitefish																								
	Lake Trout																								
	Longnose Sucker																								
	Northern Pike																								
	Rainbow Trout																								
	Round Whitefish																								

Table 4.2-3. Tags detected in each study month by Hydrologic Segment in which they were tagged.

Species	Tagging River Segment	# Tagged	2013							2014													2015						
			June	July	August	September	October	November	December	January	February	March	April	May	June	July	August	September	October	November	December	January	February	March	April	May	June	July*
Arctic Grayling	Upper River	111	0	31	22	43	33	26	22	22	21	19	19	14	64	54	44	35	31	23	25	23	21	18	18	10	15	0
	Middle/Lower US of DC	27	0	16	15	15	10	6	7	3	3	3	3	3	10	9	6	6	4	4	4	4	4	4	4	4	4	0
	Middle/Lower DS of DC	15	11	12	9	7	6	3	4	4	4	4	4	5	4	4	3	3	3	0	2	0	1	1	0	0	0	0
	Total	153	11	29	46	65	49	35	33	29	28	26	26	22	78	67	53	44	38	27	31	27	26	23	22	14	19	0
Burbot	Upper River	40	0	0	0	7	6	3	6	5	5	5	5	5	18	15	15	33	26	21	21	20	20	19	18	14	13	0
	Middle/Lower US of DC	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	5	3	4	3	3	3	3	0	2	0
	Middle/Lower DS of DC	9	2	2	7	7	2	2	2	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	54	2	2	7	14	8	5	8	7	7	6	6	5	18	15	15	38	31	24	25	23	23	22	21	14	15	0
Dolly Varden	Middle/Lower DS of DC	9	1	7	4	3	1	2	2	2	0	2	2	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0
Humpback Whitefish	Middle/Lower DS of DC	7	3	5	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lake Trout	Upper River	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	11	11	11	0	11	11	11	10	10	0
Longnose Sucker	Upper River	44	0	0	4	9	7	6	6	4	4	4	4	3	20	19	16	28	20	14	10	6	6	5	5	3	5	0
	Middle/Lower DS of DC	28	13	21	13	4	1	1	2	2	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0
	Total	72	13	21	17	13	8	7	8	6	5	5	5	4	21	20	17	28	20	14	10	6	6	5	5	3	5	0
Northern Pike	Middle/Lower DS of DC	5	0	0	5	0	0	3	3	3	2	2	2	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
Rainbow Trout	Middle/Lower DS of DC	44	11	28	28	24	19	13	19	20	15	20	20	15	12	12	15	11	8	0	7	0	6	3	3	0	3	2
Round Whitefish	Upper River	41	0	0	0	18	18	13	14	12	8	7	7	5	10	11	9	24	20	10	14	11	10	10	9	5	8	0
	Middle/Lower DS of DC	21	11	11	11	18	13	7	9	6	6	5	4	4	3	3	3	2	1	1	1	1	1	1	1	1	1	0
	Total	62	11	11	11	36	31	20	23	18	14	12	11	9	13	14	12	26	21	11	15	12	11	11	10	6	9	0
All Species Total		418	52	103	122	155	116	85	96	85	71	73	72	58	145	130	113	160	130	87	99	68	83	75	72	47	61	2

* Includes a partial survey of the Middle River study area on 7/6/2015

Table 5.1-1. Summary statistics by species and tagging segment.

Tagging Location	Species	Season	Tags with ≥ 1 Live Detection	Min Tracking Period	Median Tracking Period	Max Tracking period	# Tags Detected at Fixed Stations	# Tags Detected at Aerial Surveys	# Aerial Surveys (min)	# Aerial Surveys (median)	# Aerial Surveys (max)	Total Distance Traveled (miles, min)	Total Distance Traveled (miles, median)	Total Distance Traveled (miles, max)	Linear Home Range (miles, min)	Linear Home Range (miles, median)	Linear Home Range (miles, max)	# Tags Detected in Mainstem (non-confluence)	Mainstem Selection Ratio (ave)	# Tags Detected in Confluence	Confluence Selection Ratio (ave)	# Tags Detected in Tributaries (non-confluence)	Tributary Selection Ratio (ave)	# Tags that Passed Watana Dam (DS)	# Tags that Passed Watana Dam (US)	# Tags that Passed I3 (DS)	# Tags that Passed I1 (DS)	# Tags that Remained within Reservoir/ZHI	# Tags that Remained out of Reservoir/ZHI
Upper River and Middle River Above Devils Canyon	Arctic Grayling	All Seasons	133	5	105	706	87	129	1	12	37	0.3	24.2	182.5	0.6	21.7	91.3	119	0.8*	127	4.6*	70	0.6*	43	12	13	12	73	7
		Foraging	133				83	128	1	10	21	0.3	16.8	134	0.5	13.2	91.3	117	0.8*	126	4.7*	68	0.5*	36	3	12	11	79	4
		Overwintering	71				21	89	1	7	17	0	7.5	64.5	0	5.7	37.5	64	1.2*	41	2.3*	6	0.3*	8	4	0	0	61	9
		Spawning	41				3	40	1	2	4	0	5.4	44.7	0	5.2	44.7	33	1.2	11	0.6	6	0.4*	0	5	1	1	28	6
	Burbot	All Seasons	44	4	236	638	23	43	1	14	39	0	10.4	53.6	1	3.3	23.5	43	1.3*	35	3.4*	2	0.1*	4	4	0	0	37	4
		Foraging	44				23	43	1	4	19	0	3.3	39.9	0.1	2.6	23.5	40	1.3*	34	3.8*	2	0.1*	4	4			38	4
		Overwintering	35				9	35	1	9	18	0.1	4.1	22.5	0.1	2.4	22.2	34	1.3*	19	3.4*	0	0*	2	1	–	–	30	3
		Spawning	26				0	26	2	2	4	0.1	0.3	6.3	0.1	0.3	6.3	22	1.2	9	1.5	0	0*	0	0			22	4
	Lake Trout	All Seasons	12	66	272	272	0	12	2	10	10	0.1	2.1	3	–	–	–	0	0	0	0	0	0	0	0	0	0	1	11
		Foraging	11				0	11	1	2	2	0	0.3	0.7	–	–	–	0	0	0	0	0	0	–	–	–	–	1	10
		Overwintering	12				0	12	1	6	6	0.4	0.5	1.2	–	–	–	0	0	0	0	0	0	–	–	–	–	1	11
		Spawning	11					11	1	2	2	0.1	0.2	0.6	–	–	–	0	0	0	0	0	0	–	–	–	–	0	11
	Longnose Sucker	All Seasons	39	4	72	518	28	37	1	9	35	0.5	24.3	190.8	0.1	23.5	104	36	1.3	35	3.5*	9	0.1*	12	0	9	8	31	5
		Foraging	39				27	36	1	6	17	0.1	15.7	190.8	0.1	5.3	104	31	1.2	32	4.1*	6	0.1*	8	0	8	8	28	6
		Overwintering	24				7	24	1	3	16	0.6	3.7	24	0.2	2.5	24	23	1.4*	12	2.6	0	0*	3	0	1	0	20	4
		Spawning	24				10	19	1	1	2	0.1	1	66.8	0.1	1	12.9	16	1.3	14	1.5	2	0.3*	1	0	0	0	17	2
	Round Whitefish	All Seasons	41	15	102	623	23	41	1	7	35	0.5	23.9	170.6	5.1	16.2	99.7	39	1.2	37	3.3*	10	0.1*	11	2	3	3	34	3
		Foraging	41				22	37	1	2	24	0	3.9	101.4	0.1	8.7	99.7	36	1.3*	29	2.5	9	0.2*	3	2	2	2	32	2
		Overwintering	27				0	27	1	6	17	0.5	8.7	30.8	0.5	5.6	23.1	26	1.3*	14	2.8*	0	0*	6	0	1	1	27	0
		Spawning	37				13	35	1	2	2	0	2.2	31.9	0.1	3.3	23.4	29	1.1	21	1.6	2	0.1*	2	0	0	0	32	3
Middle/Lower River and Downstream of Devils Canyon	Arctic Grayling	All Seasons	15	23	55	648	12	15	3	11	55	0.1	39	272	3.9	58.4	114	14	0.5*	14	3.5	11	1.1	0	0	0	0	3	2
		Foraging	15				12	15	3	11	45	0.1	36	171.5	0.1	34	45.5	11	0.5	9	3.7	11	1.2	–	–	–	–	3	3
		Overwintering	5				3	5	5	7	10	10	37.1	68.4	10	35.4	68.4	5	1.1	4	3.9	0	0	–	–	–	–	5	0
		Spawning	4				0	4	1	1.5	2	2.7		57.2	2.7		57.2	4	1.4	0	0	0	0	–	–	–	–	3	0
	Burbot	All Seasons	9	4	35	445	2	9	1	2	18	0.3	2.6	38.8	10.1	12.6	16.2	8	1.1	5	2.1	2	1.1	0	0	0	0	3	5
		Foraging	9				2	9	1	2	13	0.3	2.6	15.8	1.7	5.9	10.1	8	1.1	5	2.1	2	1.1					2	5
		Overwintering	2				0	2	5	7	9	13	20.2	27	12.2	12.8	13.3	2	1	2	3.5	0	0	–	–	–	–	1	0
		Spawning	2				0	2	2	2	2	1.8	2.1	2.4	1.8	2.1	2.4	2	1.3	1	0.9	0	0	–	–	–	–	2	0
	Dolly Varden	All Seasons	9	1	14	370	4	9	1	4	14	0.1	19.1	71.4	6.7	23.4	46.4	4	0.7	3	0.7	7	3	0	0	0	0	2	4
		Foraging	9				4	9	1	3	9	0.1	6.3	35.2	2.3	14	24.5	3	0.8	3	0.6	7	3.8					2	5
		Overwintering	3				0	3	1	6	6	7.9	17	26.1	3.8	11.9	20	2	0.8	0	0	2	1.9	–	–	–	–	1	1
		Spawning	2				0	2	1	1	1		–	–	–	–	–	0	0	1	1	1	2.3	–	–	–	–	0	2
	Humpback Whitefish	All Seasons	6	7	16	41	5	6	1	3	15	4.2	33	59				6	1	6	3.9	2	0.7	0	0	0	0	5	1
		Foraging	6	7	10	41	5	6	1	3	15	4.2	33	59	–	–	–	6	1	6	3.9	2	0.7	–	–	–	–	5	1
		Overwintering	0																										
		Spawning	0				–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	Northern Pike	All Seasons	4	144	253	439	0	4	1	5	28	1.0	6	30.4	0.9	1.7	30.4	0	0*	0	0*	4	8.4	0	0	0	0	0	4
		Foraging	2				0	2	1	9	17	7.4	18.9	30.4	2.1	16.3	30.4	0	0	0	0	2	9	–	–	–	–	0	2
		Overwintering	3				0	3	3	7	10	0.8	1.2	1.5	0.5	0.8	0.9	0	0	0	0	3	6.3	–	–	–	–	0	3
		Spawning	1				0	1	1	1	1							0	0	0	0	1	3.7					0	1
	Longnose Sucker	All Seasons	27	4	15	436	20	25	1	4	58	0.6	11.9	82.1	2.7	14.5	32.5	24	1.2	21	2.1	4	0.5	0	0	0	0	21	3
		Foraging	27				20	25	1	4	46	0.2	6.9	53.3	1.4	13.1	32.5	24	1.2	21	2.2	3	0.5	–	–	–	–	22	3
		Overwintering	5				2	5	2	4	8	1.6	3.7	23.2	1.6	2.6	23	4	0.9	4	1.8	1	0.8					4	0
		Spawning	1				0	1	2	2	2	0.4	0.4	0.4	0.4	0.4	0.4	0	0	1	1.3	0	0					1	0
	Rainbow Trout	All Seasons	44	6	72	649	28	44	1	12	58	0.6	23.7	171.4	3.5	17	103	35	0.7*	33	2.6*	37	2.4*	0	0	0	0	6	12
		Foraging	44				27	44	1	7	45	0.6	13.9	90.5	0.4	7	64.6	32	0.5*	32	3.1*	36	2.5*	–	–	–	–	7	13
		Overwintering	20				2	20	5	8.5	18	0.1	6.6	26.5	0.1	3.5	26.5	19	1.2	10	1.4	3	0.3*					11	4
		Spawning	26				8	24	1	3	6	0.1	5	61.1	0.1	6.5	94.7	20	0.7*	13	0.6	13	1.5	–	–	–	–	7	5
	Round Whitefish	All Seasons	21	5	114	575	17	21	1	12	48	4.6	56.8	177.1	1.7	38	92.2	21	1.1	18	2	8	0.6	0	0	0	0	12	1
		Foraging	21				14	17	1	11	27	7.7	52.1	92.2	2.7	35.6	92.2	16	1.1	10	1.2	7	1					6	2
		Overwintering	11				1	11	2	7	14	0.5	9.8	80	0.5	6.9	54.8	11	1.1	8	2.3	1	0.1*	–	–	–	–	9	0
		Spawning	13				5	13	1	2	7	0.3	6.7	21.4	0.3	6.7	21.4	12	1.2	7	1.5	0	0*	–	–	–	–	10	2

Table 5.1-2. Movements of fish, tagged upstream of Devils Canyon, past the Watana Dam site, 2013-2015.

Downstream	Forage 2013	Overwinter 2013/2014	Forage 2014	Overwinter 2014/2015	Forage 2015
Arctic Grayling	9	6	22	2	9
Burbot	0	0	5	3	0
Longnose Sucker	1	0	8	3	0
Round Whitefish	0	4	3	5	0

Upstream	Forage 2013	Overwinter 2013/2014	Forage 2014	Overwinter 2014/2015	Forage 2015
Arctic Grayling	0	2	3	7	0
Round Whitefish	0	0	7	2	3

Table 5.1-3. Habitat selection ratios by species, tagging segment, and season. Bold values indicate significant selection for or against a habitat type.

		All Seasons				Overwintering Season				Foraging Season				Spawning Season			
Species	**Taging Segment**	N	Average of Mainstem Selection Ratio	Average of Confluence Selection Ratio	Average of Tributary Selection Ratio	N	Average of Mainstem Selection Ratio	Average of Confluence Selection Ratio	Average of Tributary Selection Ratio	N	Average of Mainstem Selection Ratio	Average of Confluence Selection Ratio	Average of Tributary Selection Ratio	N	Average of Mainstem Selection Ratio	Average of Confluence Selection Ratio	Average of Tributary Selection Ratio
Arctic Grayling	US of DC	133	0.8	**4.6**	0.6	69	1.2	**2.3**	0.3	128	0.7	**4.9**	0.5	40	1.2	0.6	0.4
Arctic Grayling	DS of DC	15	0.5	**3.6**	1.1	7	1.1	**3.9**	0.0	15	0.5	**3.7**	1.2	5	1.4	0.0	0.0
Arctic Grayling Total		148	0.7	**4.5**	0.6	76	1.2	**2.5**	0.3	143	0.7	**4.8**	0.6	45	1.3	0.6	0.3
Burbot	US of DC	43	1.3	**3.4**	0.1	35	1.3	**3.4**	0.0	43	1.3	**3.4**	0.1	26	1.2	1.5	0.0
Burbot	DS of DC	9	1.1	**2.1**	1.1	2	1.0	**3.5**	0.0	9	1.1	**2.1**	1.1	2	1.3	0.9	0.0
Burbot Total		52	1.2	**3.2**	0.2	37	1.3	**3.4**	0.0	52	1.3	**3.1**	0.2	28	1.2	1.5	0.0
Dolly Varden	DS of DC	9	0.7	0.7	**3.0**	3	0.8	0.0	1.9	9	0.6	0.6	**3.8**	2	0.0	1.0	**2.3**
Humpback Whitefish	**DS of DC**	6	1.0	**3.9**	**0.7**					6	**1.0**	**3.9**	**0.7**				
Lake Trout	US of DC	12	0.0	0.0	0.0	12	0.0	0.0	0.0	11	0.0	0.0	0.0	11	0.0	0.0	0.0
Longnose Sucker	US of DC	37	**1.3**	**3.5**	**0.1**	24	1.4	**2.6**	**0.0**	36	1.2	**4.2**	**0.1**	19	1.3	1.4	**0.3**
Longnose Sucker	DS of DC	25	1.2	**2.1**	0.5	5	0.9	1.8	0.8	25	1.2	**2.2**	0.5	1	1.3	0.0	0.0
Longnose Sucker Total		62	1.2	**3.0**	0.3	29	1.3	**2.5**	0.2	61	1.2	**3.4**	0.3	20	1.3	1.4	0.3
Northern Pike	DS of DC	4	0.0	0.0	**8.4**	3	0.0	0.0	9.0	2	0.0	0.0	**6.3**	1	0.0	0.0	**3.7**
Rainbow Trout	DS of DC	44	0.7	**2.5**	**2.4**	20	1.2	1.4	**0.3**	44	0.5	**3.1**	**2.5**	24	0.7	0.6	1.5
Round Whitefish	US of DC	41	1.2	**3.3**	0.2	27	1.3	**2.8**	0.0	37	1.3	**2.5**	0.2	35	1.1	1.6	0.1
Round Whitefish	DS of DC	21	1.1	**2.0**	0.6	11	1.1	**2.3**	0.1	17	1.1	1.2	1.0	13	1.2	1.5	0.0
Round Whitefish Total		62	1.2	**2.9**	0.3	38	1.2	**2.7**	0.0	54	1.3	**2.1**	0.5	48	1.2	1.6	0.1
Grand Total		397	0.9	**3.3**	0.8	218	1.1	**2.4**	0.3	382	0.9	**3.5**	0.8	179	1.1	1.0	0.4

Table 5.1-4. Tributary streams used during the foraging period, by fish tagged in the Upper Susitna River drainage.

Species	Tributary Mouth in Inundation Zone	River Section	Tributary	Year	Number of Fish	First Detection	Last Detection
Arctic Grayling	No	Lower	Kashwitna River	2014	1	17-Jun	17-Jun
	No	Middle	Chinook Creek	2013	1	17-Sep	24-Sep
	No	Middle	Fog Creek	2013	1	21-Oct	21-Oct
				2014	2	17-Jul	3-Aug
	No	Middle	Tsusena Creek	2013	2	30-Jul	13-Aug
				2014	8	21-Jun	17-Sep
				2015	4	4-Jun	23-Jun
	Yes	Upper	Deadman Creek	2013	3	1-Aug	26-Aug
				2014	8	11-Jun	5-Sep
	Yes	Upper	Watana Creek	2013	3	6-Aug	23-Sep
				2014	8	20-May	27-Sep
	Yes	Upper	Kosina Creek	2013	3	31-Jul	13-Aug
				2014	17	20-May	17-Sep
				2015	1	20-May	20-May
	No	Upper	Goose Creek	2013	1	23-Sep	23-Sep
				2014	2	20-May	17-Sep
				2015	1	20-May	23-Jun
	No	Upper	Oshetna River	2013	4	26-Aug	28-Oct
				2014	2	21-May	24-Sep
				2015	1	4-Jun	23-Jun
	No	Upper	Tyone River	2015	1	4-Jun	4-Jun
Burbot	Yes	Upper	Watana Creek	2014	2	17-Jul	25-Jul
	No	Upper	Tyone River	2014	1	17-Sep	17-Sep
Longnose Sucker	Yes	Upper	Watana Creek	2014	3	16-Jun	3-Aug
	No	Upper	Oshetna River	2015	1	20-May	23-Jun
	No	Upper	Tyone River	2015	1	4-Jun	4-Jun
Round Whitefish	Yes	Upper	Deadman Creek	2014	1	17-Jul	3-Aug
	Yes	Upper	Watana Creek	2014	2	16-Jun	5-Sep
				2015	2	4-Jun	23-Jun
	Yes	Upper	Kosina Creek	2014	2	11-Jun	3-Aug
				2015	3	4-Jun	23-Jun
	No	Upper	Tyone River	2014	1	17-Sep	17-Sep

Table 5.1-4 (Continued). Tributary streams used during the foraging period, by fish tagged in the Middle and Lower Susitna River drainage.

Species	River Section	Tributary	Year	Number of Fish	First Detection	Last Detection
Arctic Grayling	Middle	Lane Creek	2013	1	24-Jul	24-Jul
		Indian River	2013	1	22-Jun	1-Oct
			2014	1	5-Jul	30-Sep
		Portage Creek	2013	10	22-Jun	7-Oct
			2014	3	21-Jun	30-Sep
		Fog Creek	2013	8	26-Jul	30-Sep
			2014	1	1-Aug	24-Aug
		Tsusena Creek	2013	5	19-Jul	9-Sep
			2014	6	11-Jun	15-Aug
			2015	4	4-Jun	23-Jun
Burbot	Lower	Talkeetna River	2013	1	23-Aug	23-Aug
		Chulitna River	2013	1	16-Aug	13-Sep
Dolly Varden	Lower	Talkeetna River	2013	6	15-Jul	9-Oct
			2014	2	1-May	19-Jul
	Middle	Indian River	2013	1	8-Jul	10-Sep
Humpback Whitefish	Lower	Rabideaux Creek	2013	1	3-Jul	3-Jul
	Middle	Whiskers Creek	2013	1	27-Aug	27-Aug
Longnose Sucker	Lower	Talkeetna River	2013	3	15-Jul	2-Aug
Northern Pike	Lower	Fish Creek	2014	2	1-May	20-Sep
		Yentna River	2015	1	14-May	14-May
Rainbow Trout	Lower	Willow Creek	2014	1	13-Aug	19-Aug
		Kashwitna River	2014	1	7-Aug	13-Aug
		Goose Creek	2014	1	18-Sep	21-Sep
		Montana Creek	2013	6	15-Jul	13-Sep
			2014	6	17-Jun	25-Sep
			2015	1	3-Jun	6-Jul
		Birch Creek	2014	1	19-Jul	1-Aug
		Talkeetna River	2013	8	15-Jul	23-Aug
			2014	1	21-May	30-Sep
		Chulitna River	2014	2	1-May	21-May
	Middle	4th of July Creek	2013	7	25-Jun	9-Oct
			2014	3	21-May	21-Sep
		Indian River	2013	5	26-Jun	31-Aug
			2014	4	16-Jun	30-Sep
			2015	1	6-Jul	6-Jul
Round Whitefish	Lower	Talkeetna River	2013	2	18-Jun	9-Aug
		Chulitna River	2013	1	13-Sep	13-Sep
			2014	1	2-Jul	2-Jul
	Middle	4th of July Creek	2013	1	25-Jun	25-Jun
		Gold Creek	2013	1	20-Jul	27-Aug
		Portage Creek	2013	2	13-Jul	10-Sep

Table 5.1-5. Tributary streams used during the overwintering period, by fish tagged in the Upper Susitna River drainage.

Species	Tributary Mouth in the Impoundment Zone	River Section	Tributary	Year	Number of Fish Detected	Date of First Detection	Date of Last Detection
Arctic Grayling	No	Upper	Tyone River	2013/2014	5	11-Nov	9-Apr
				2014/2015	3	2-Oct	23-Apr
Burbot	Yes	Upper	Kosina Creek	2014/2015	1	2-Oct	2-Oct
	No	Upper	Tyone River	2014/2015	1	14-Oct	14-Oct
Longnose Sucker	Yes	Upper	Watana Creek	2014/2015	2	14-Oct	4-Nov
	Yes	Upper	Jay Creek	2014/2015	1	14-Oct	14-Oct
Round Whitefish	No	Upper	Tyone River	2014/2015	2	2-Oct	14-Oct

Table 5.1-6. Tributary streams used during the overwintering period, by fish tagged in the Middle and Lower Susitna River drainage.

Species	River Section	Tributary	Year	Number of Fish	First Detection	Last Detection
Arctic Grayling	Upper	Tyone River	2014/2015	1	16-Dec	23-Apr
Dolly Varden	Lower	Talkeetna River	2013/2014	2	18-Dec	8-Apr
Longnose Sucker	Lower	Chulitna River	2013/2014	1	15-Nov	8-Apr
Northern Pike	Lower	Fish Creek	2013/2014	3	16-Nov	8-Apr
			2014/2015	1	8-Oct	29-Oct
Rainbow Trout	Lower	Montana Creek	2014/2015	3	1-Oct	15-Oct
		Chulitna River	2013/2014	1	29-Jan	8-Apr
Round Whitefish	Middle	4th of July Creek	2013/2014	1	9-Apr	9-Apr

10. FIGURES

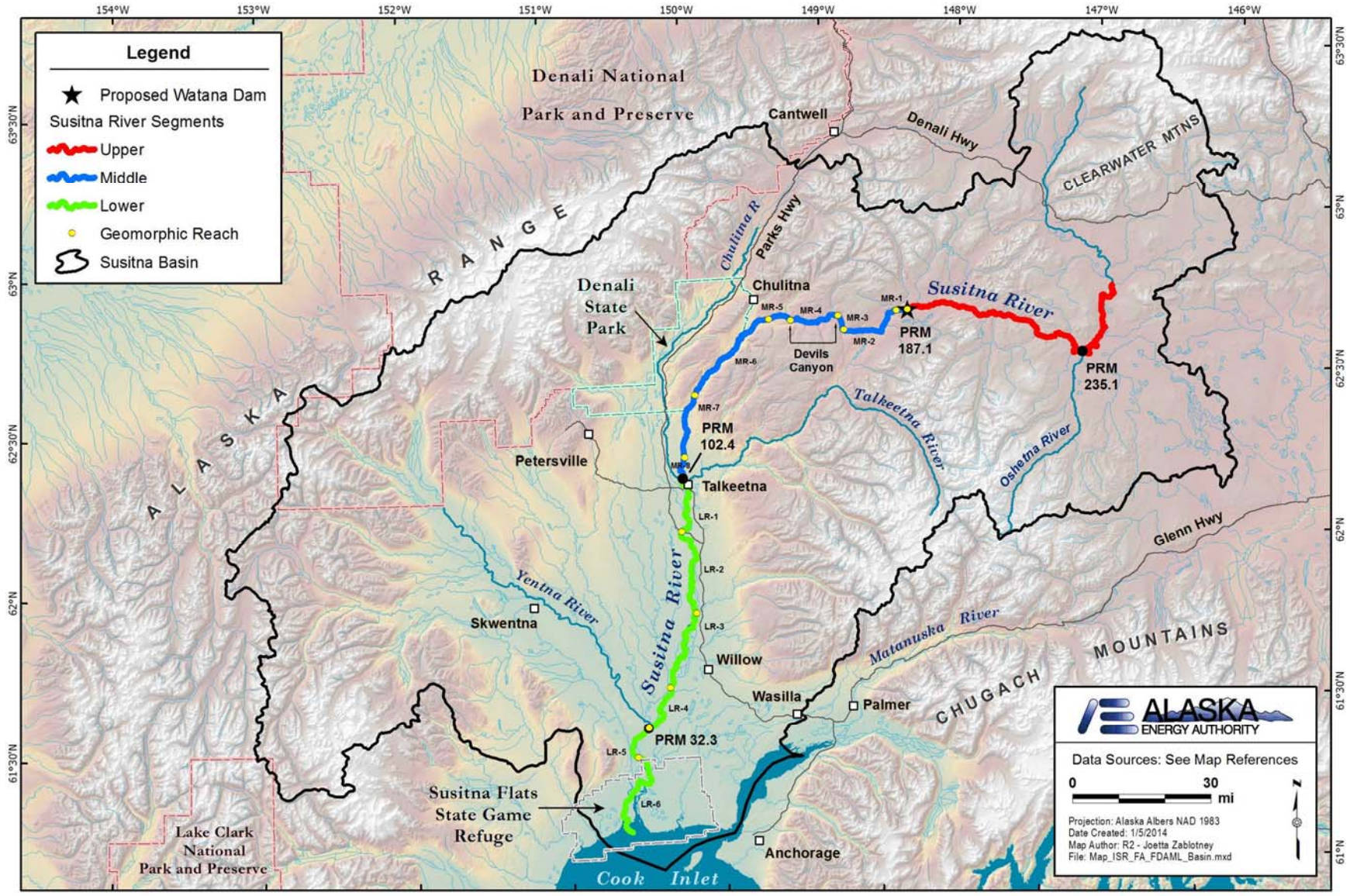

Figure 3-1. Susitna River fish distribution and abundance study area.

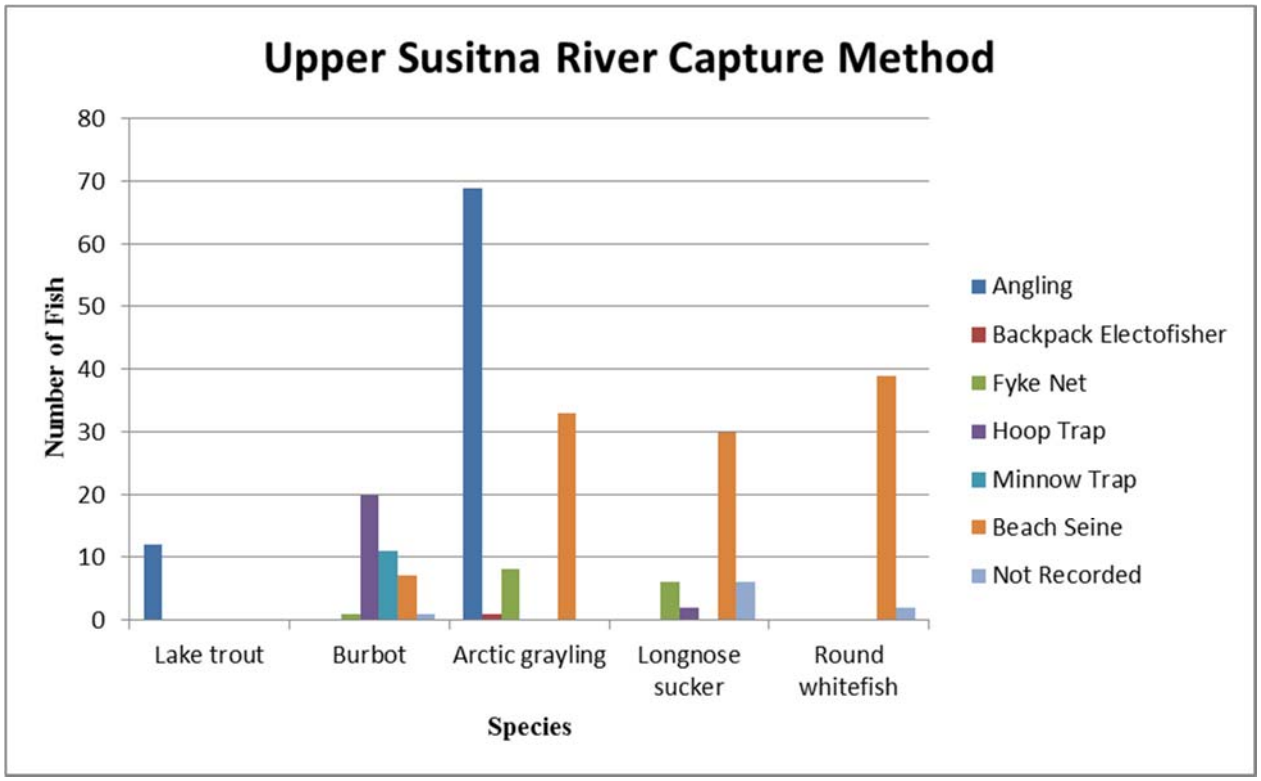

Figure 4.1-1. Total number of radio tagged fish caught by each method in the Upper Susitna River.

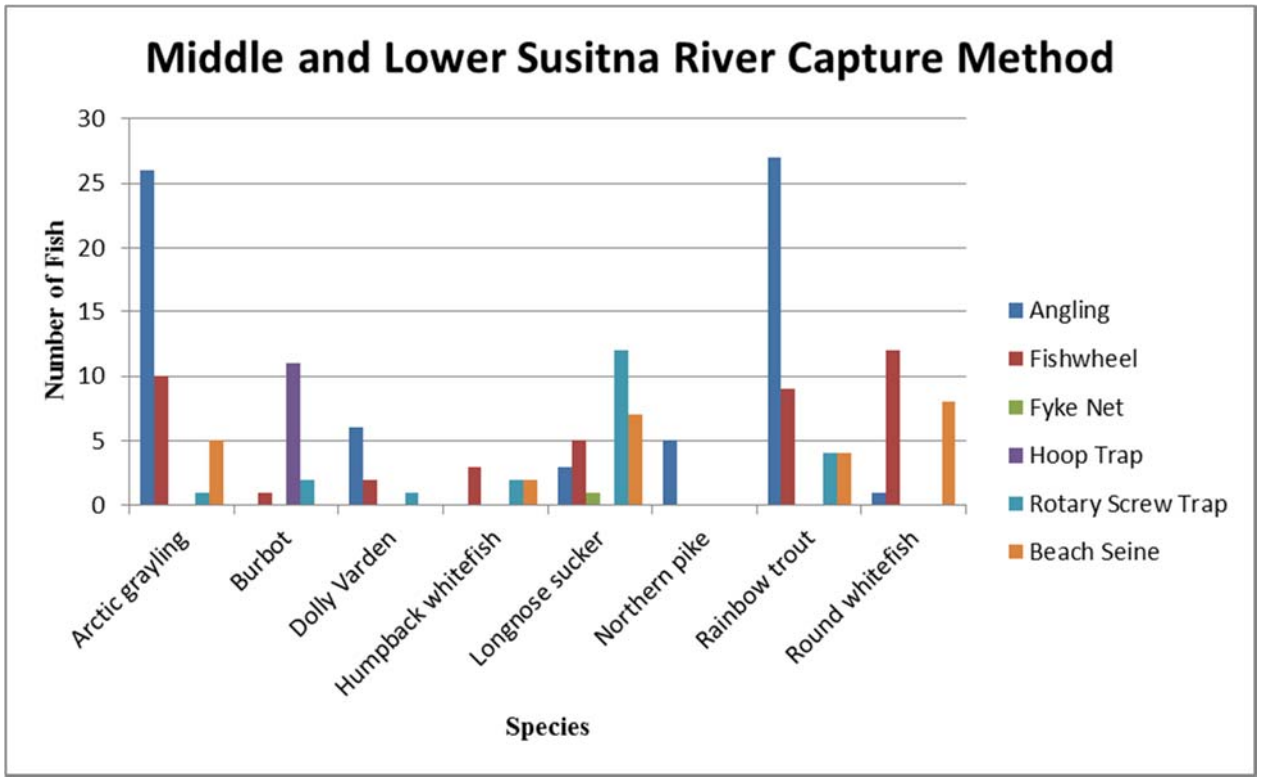

Figure 4.1-2. Total number of fish caught by each method in the Middle and Lower Susitna River.

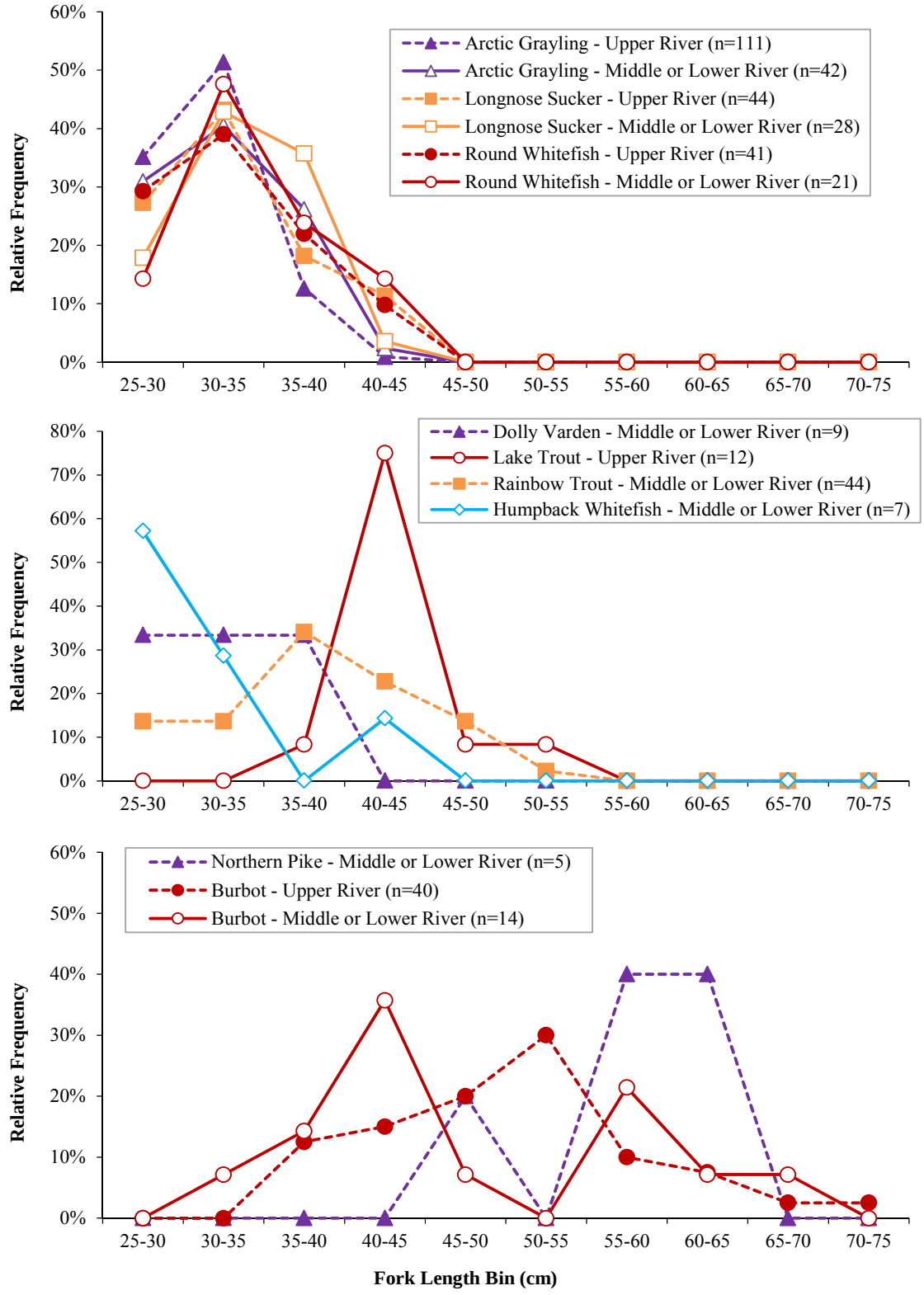

Figure 4.1-3. Relative frequencies of fork length for each species. Lengths for Burbot are total lengths.

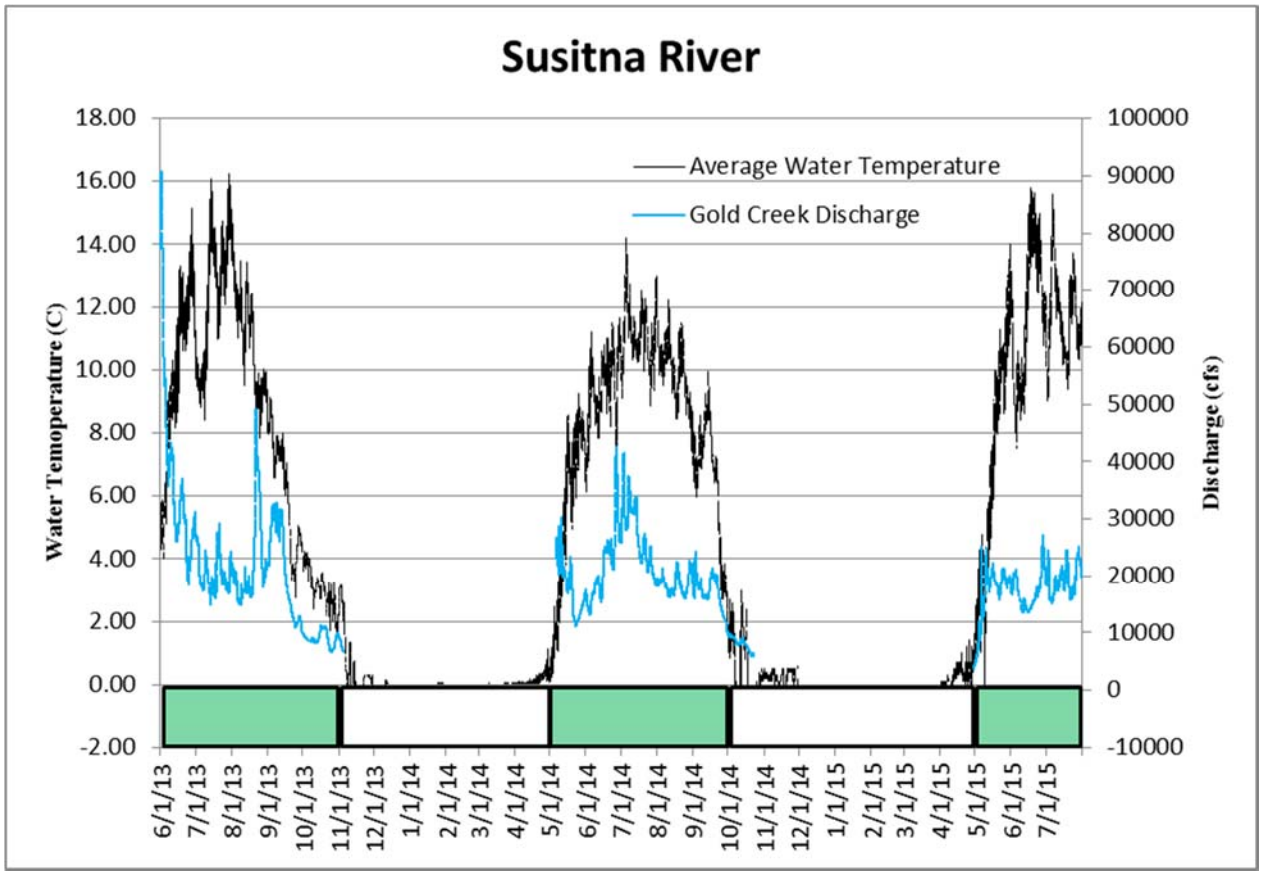

Figure 4.2-1. Susitna River discharge at Gold Creek and average water temperature of the Susitna River at Tsusena Creek, Gold Creek, and Sunshine. Green indicates foraging seasons and white indicates overwintering seasons, 2013-2015.

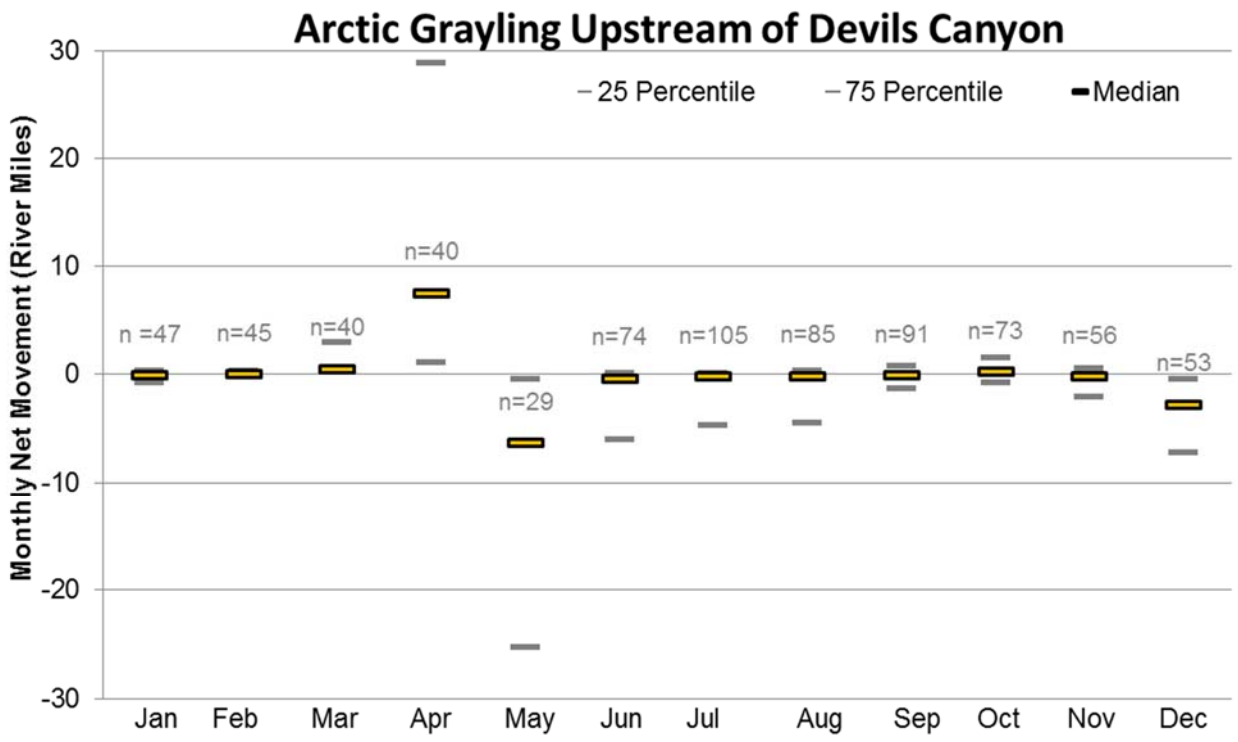

Figure 5.1-1. Net upstream and downstream movements for the tagged population of Arctic Grayling upstream of Devils Canyon by study month (sample size varies by study month from n= 29 in May to 105 in July).

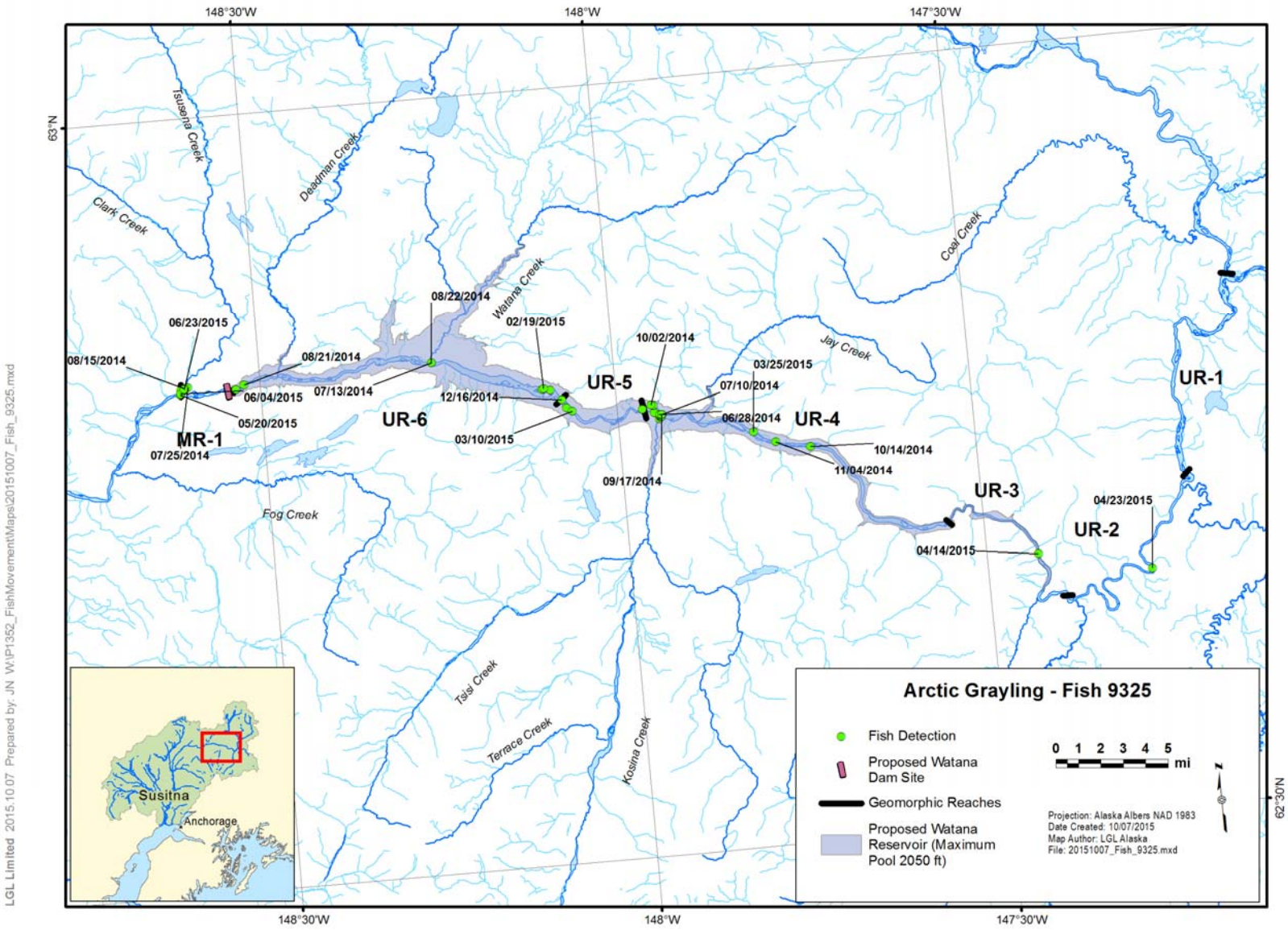

Figure 5.1-2. Tracking history for Arctic Grayling #9325, tagged in the Upper River at Kosina Creek TRM 0.1 on 6/4/2014.

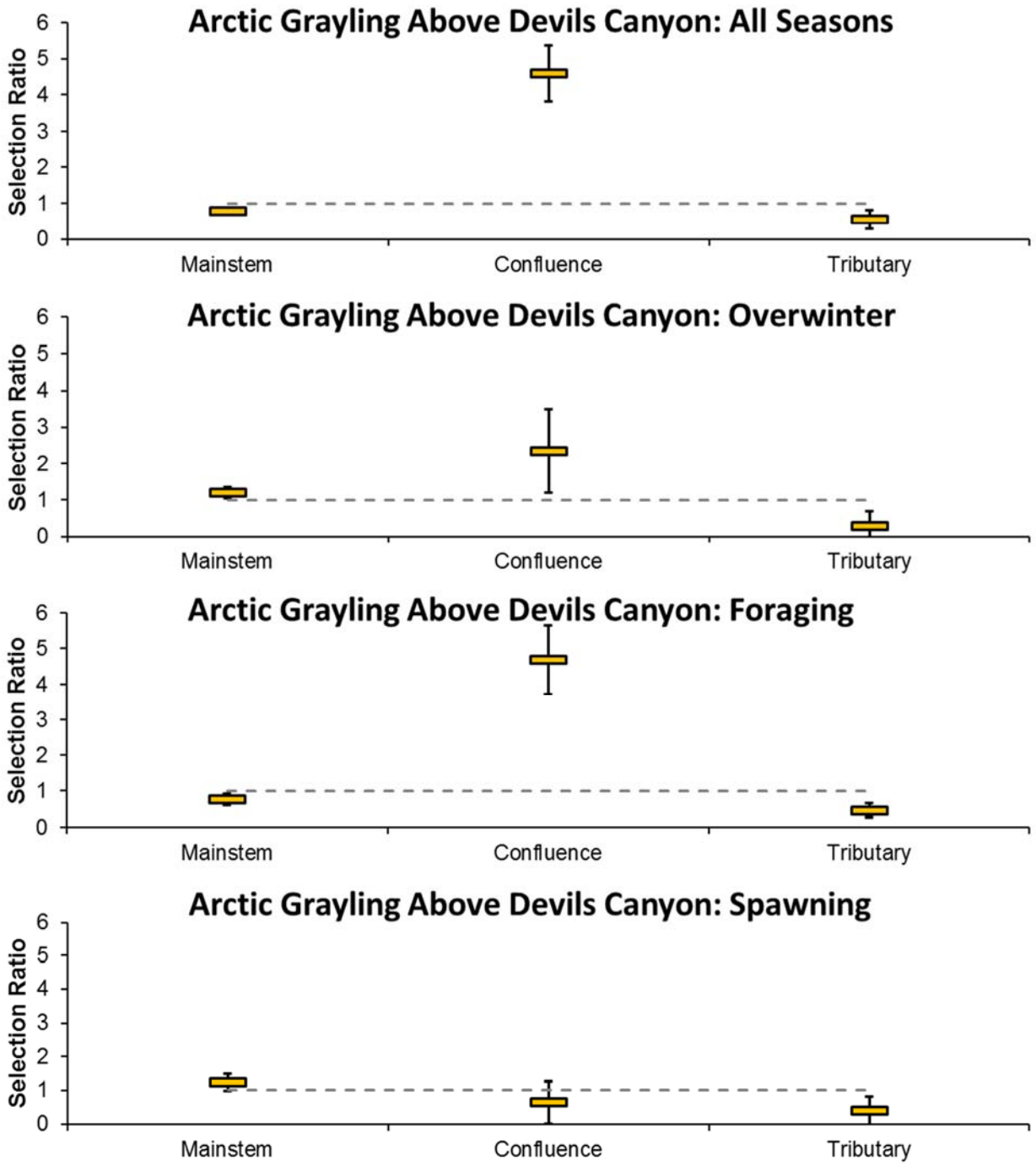

Figure 5.1-3. Selection ratios with 95% Bonferroni confidence intervals for Arctic Grayling tagged upstream of Devils Canyon.

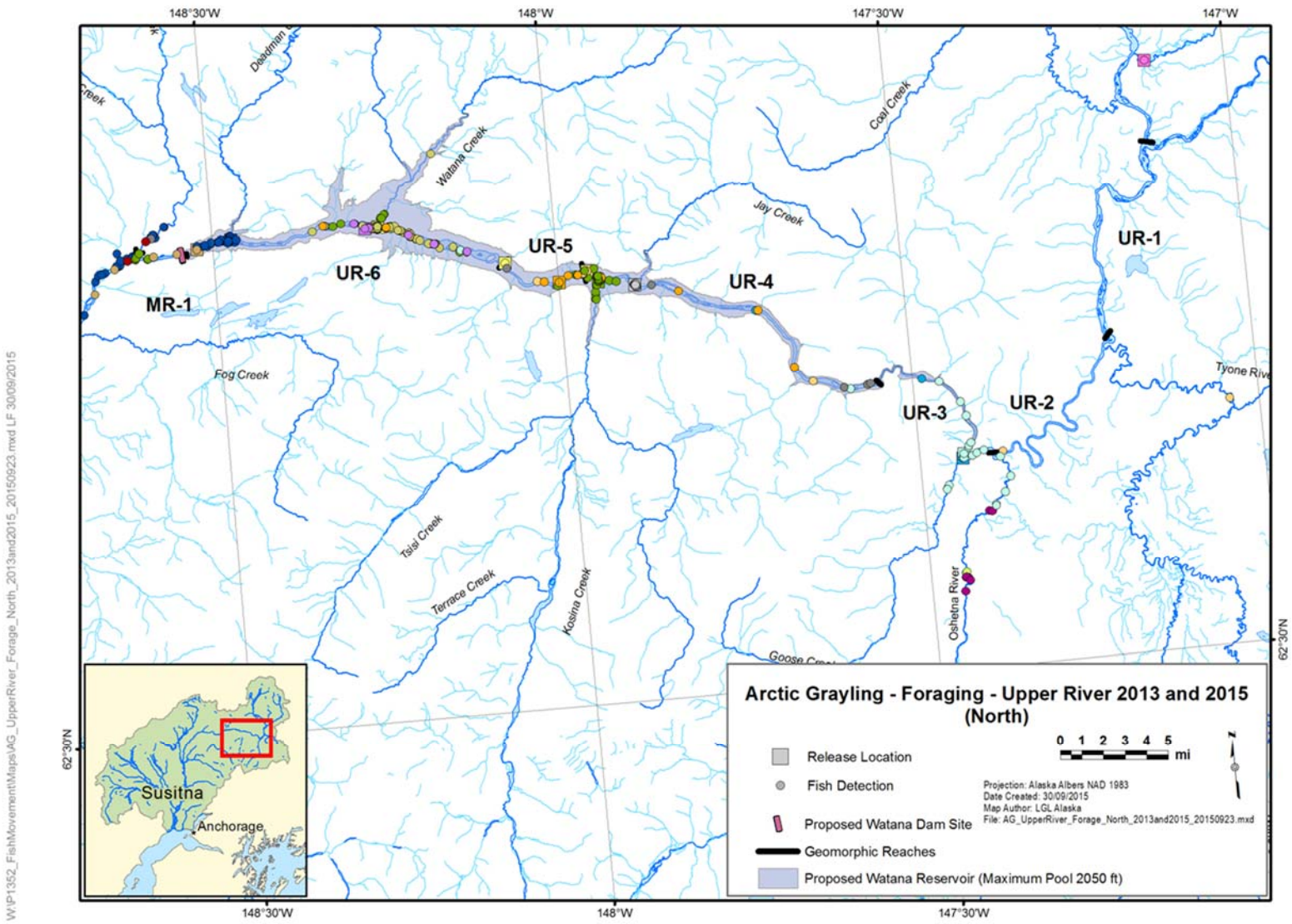

Figure 5.1-4. Locations of Arctic Grayling tagged in the Upper Susitna River, during the foraging period in 2013 and 2015. The color of each detection dot matches the color of the location where the fish was released.

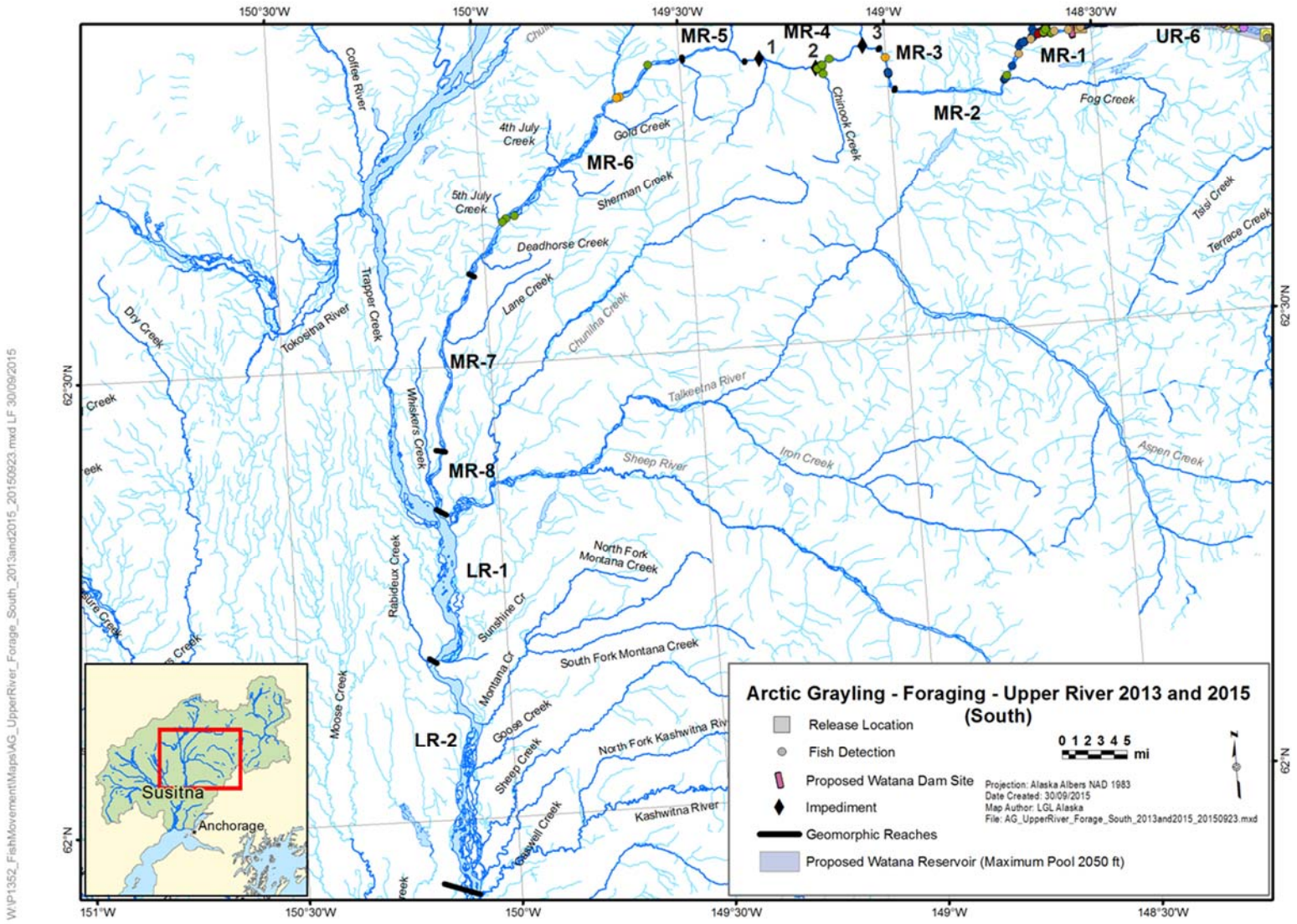

Figure 5.1-5. Locations of Arctic Grayling tagged in the Upper Susitna River, during the foraging period in 2013 and 2015. The color of each detection dot matches the color of the location where the fish was released.

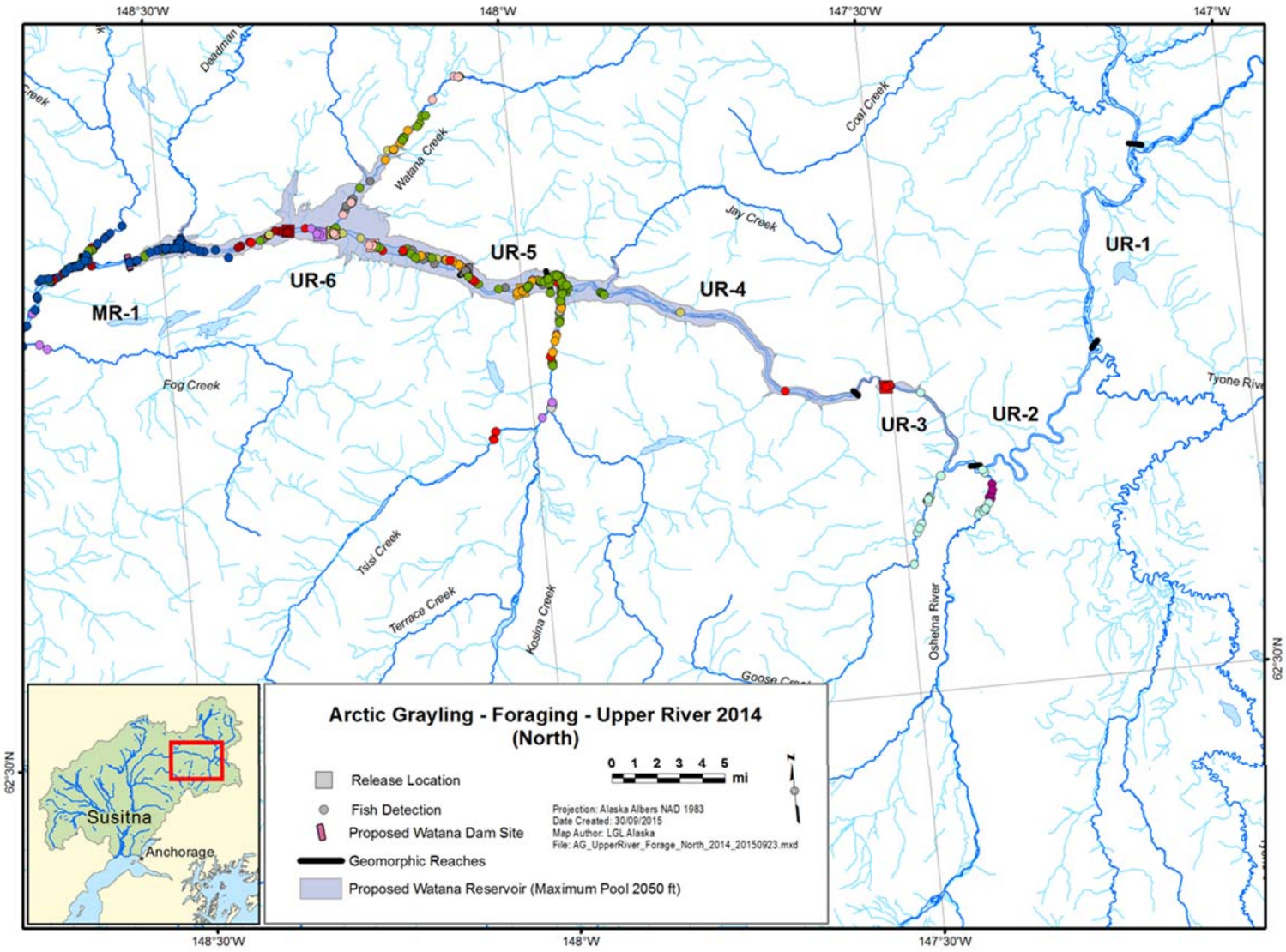

Figure 5.1-6. Locations of Arctic Grayling tagged in the Upper Susitna River, during the foraging period in 2014. The color of each detection dot matches the color of the location where the fish was released.

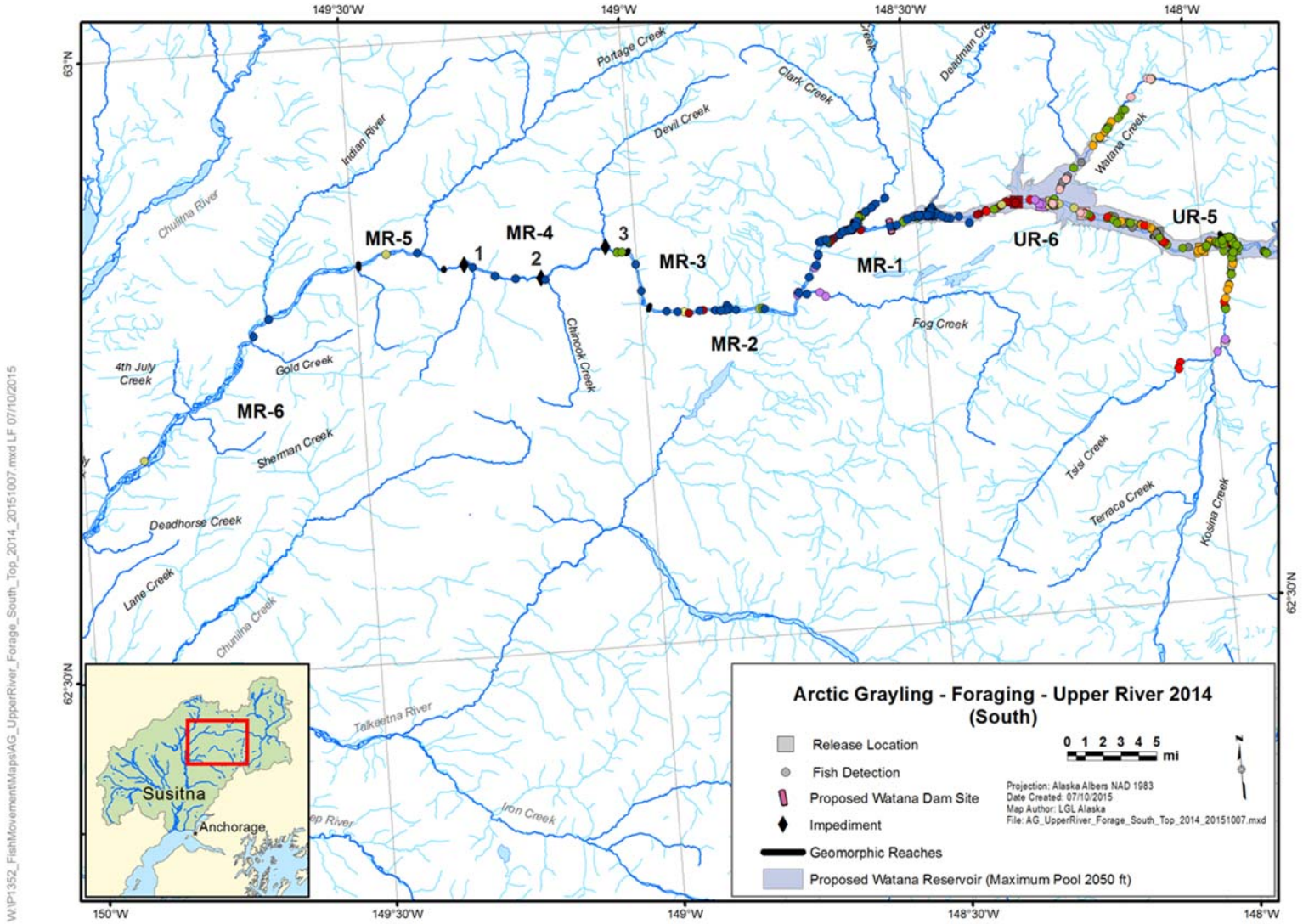

Figure 5.1-7. Locations of Arctic Grayling tagged in the Upper Susitna River, during the foraging period in 2014. The color of each detection dot matches the color of the location where the fish was released.

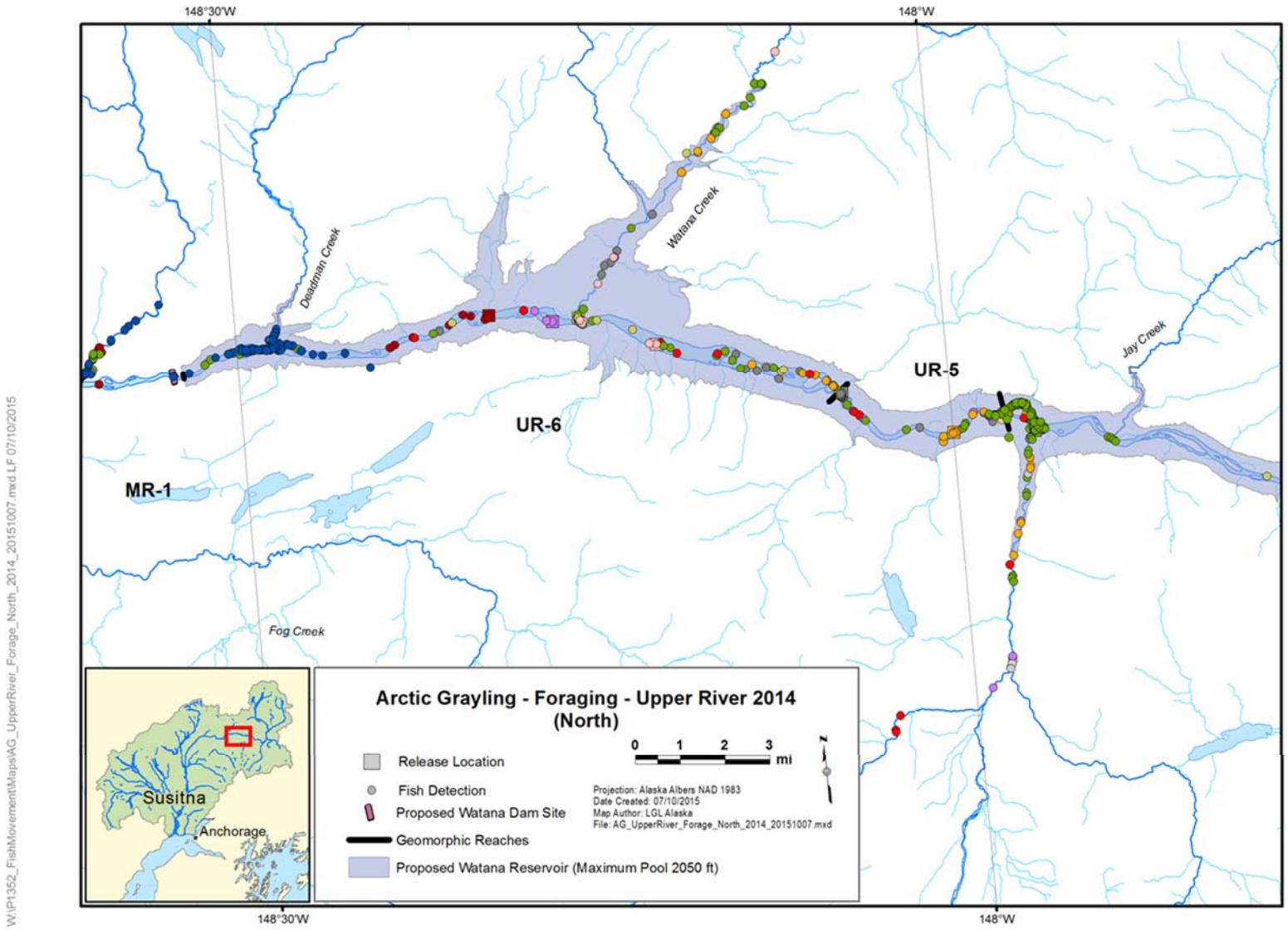

Figure 5.1-8. Locations of Arctic Grayling tagged in the Upper Susitna River, during the foraging period in 2014. The map has been cropped close to better illustrate fish congregating in and near tributary streams.

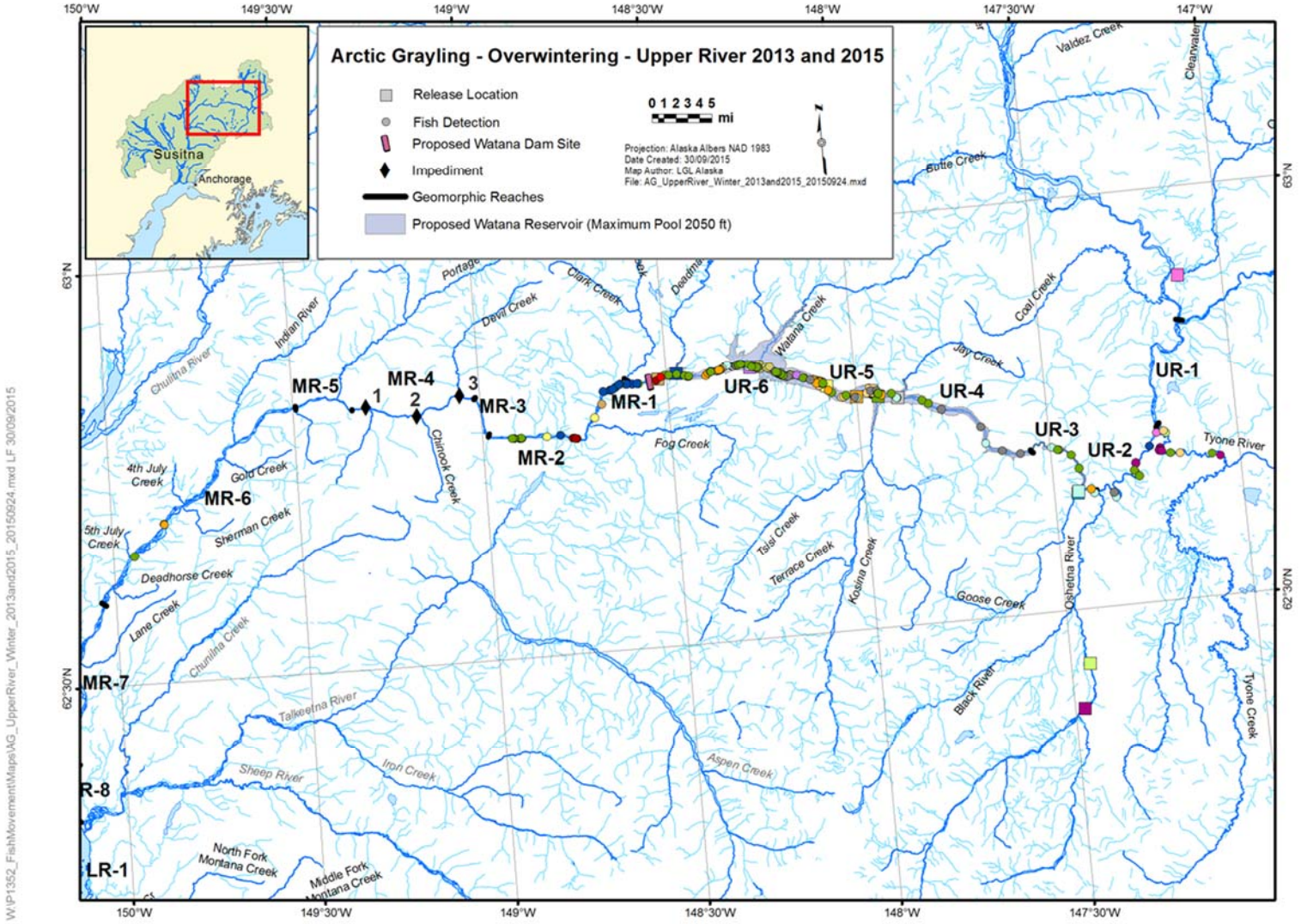

Figure 5.1-9. Locations of Arctic Grayling tagged in the Upper Susitna River, during the overwintering period in 2013 and 2015. The color of each detection dot matches the color of the location where the fish was released.

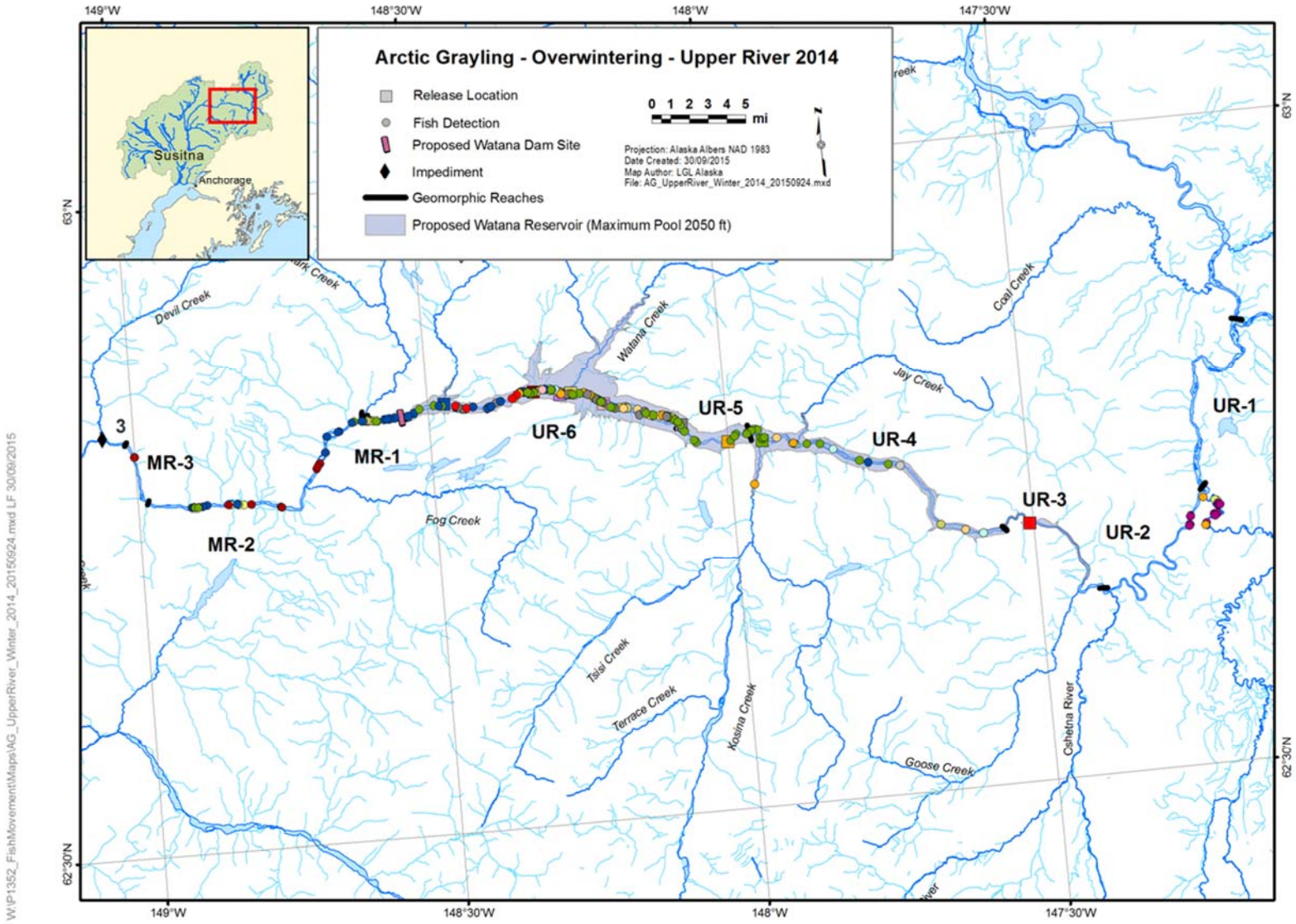

Figure 5.1-10. Figure 5.1-11. Locations of Arctic Grayling tagged in the Upper Susitna River, during the overwintering period in 2014. The color of each detection dot matches the color of the location where the fish was released.

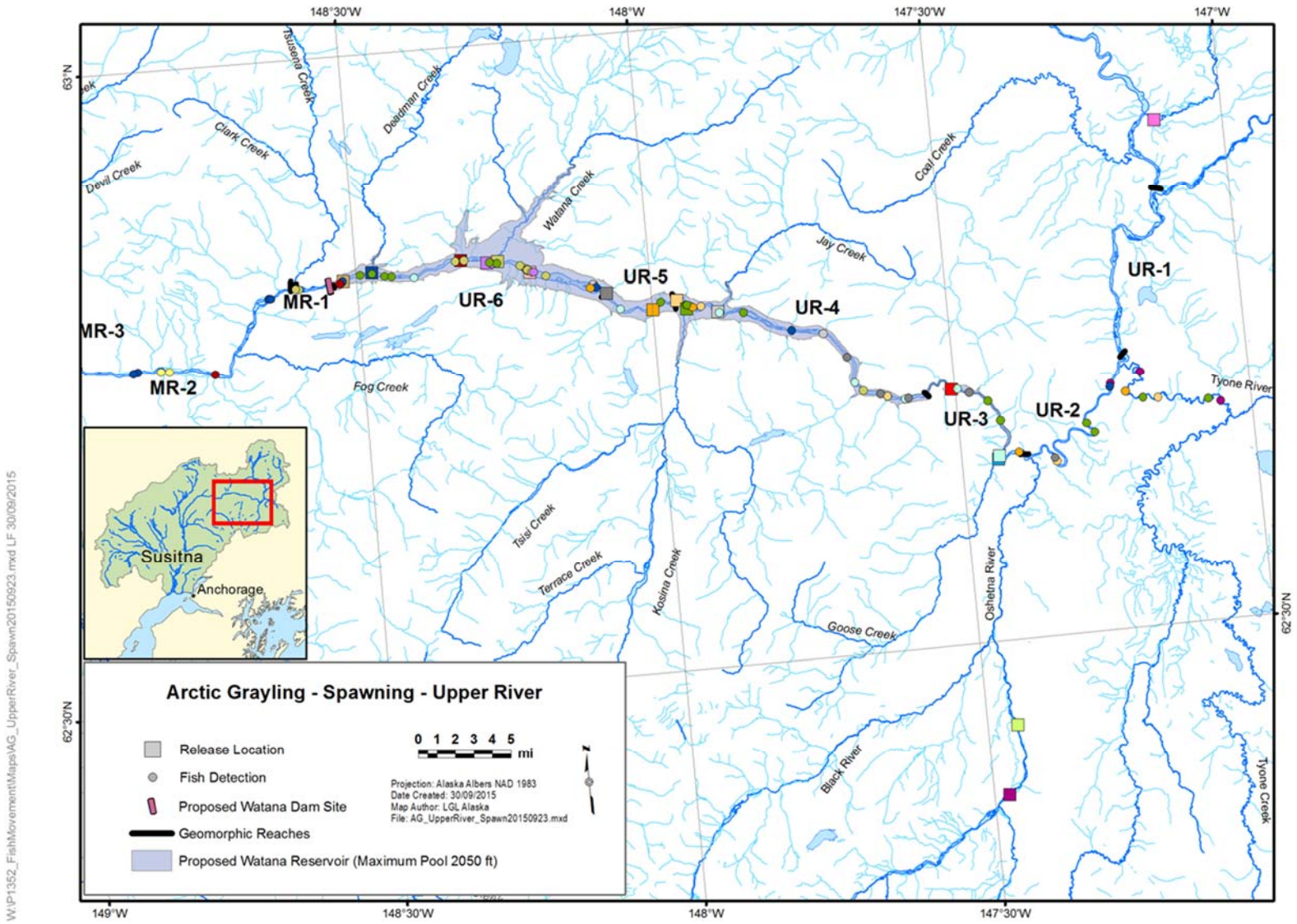

Figure 5.1-11. Locations of Arctic Grayling tagged in the Upper Susitna River, during the spawning period. The color of each detection dot matches the color of the location where the fish was released (squares).

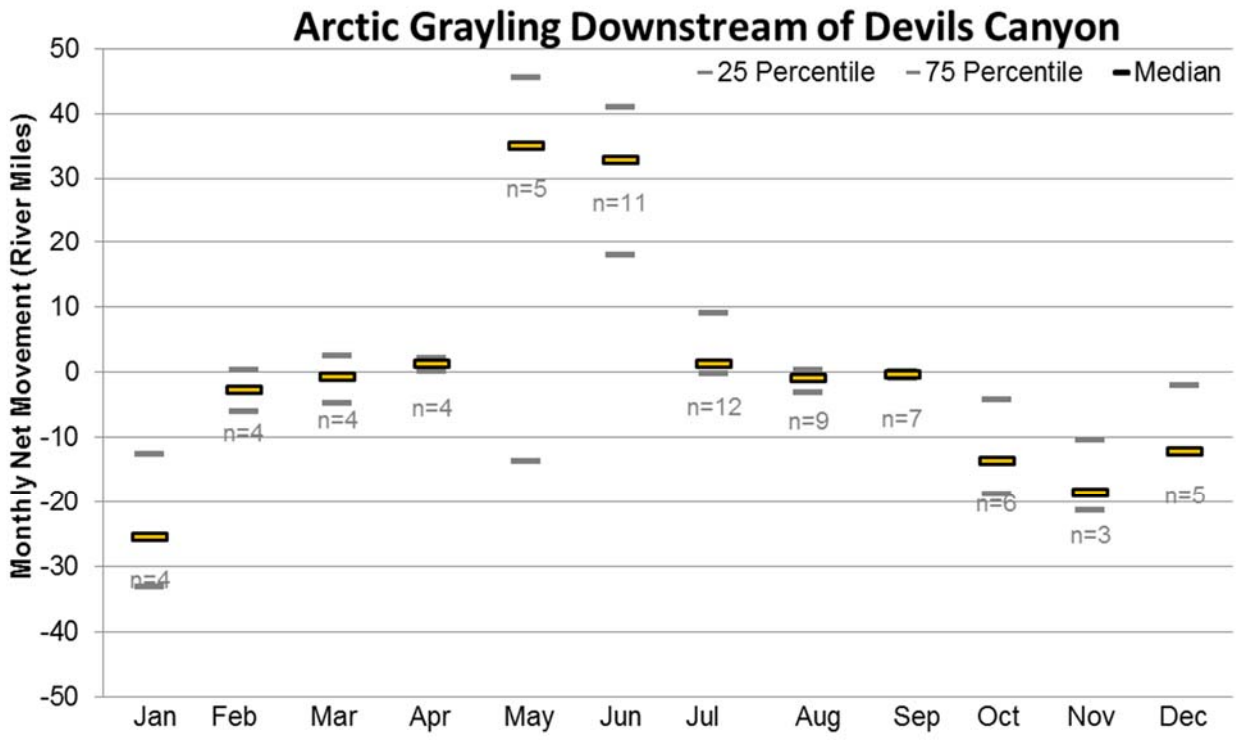

Figure 5.1-12. Net upstream and downstream movements for the tagged population of Arctic Grayling downstream of Devils Canyon by study month (sample size varies by study month from n= 3 in November to 12 in July).

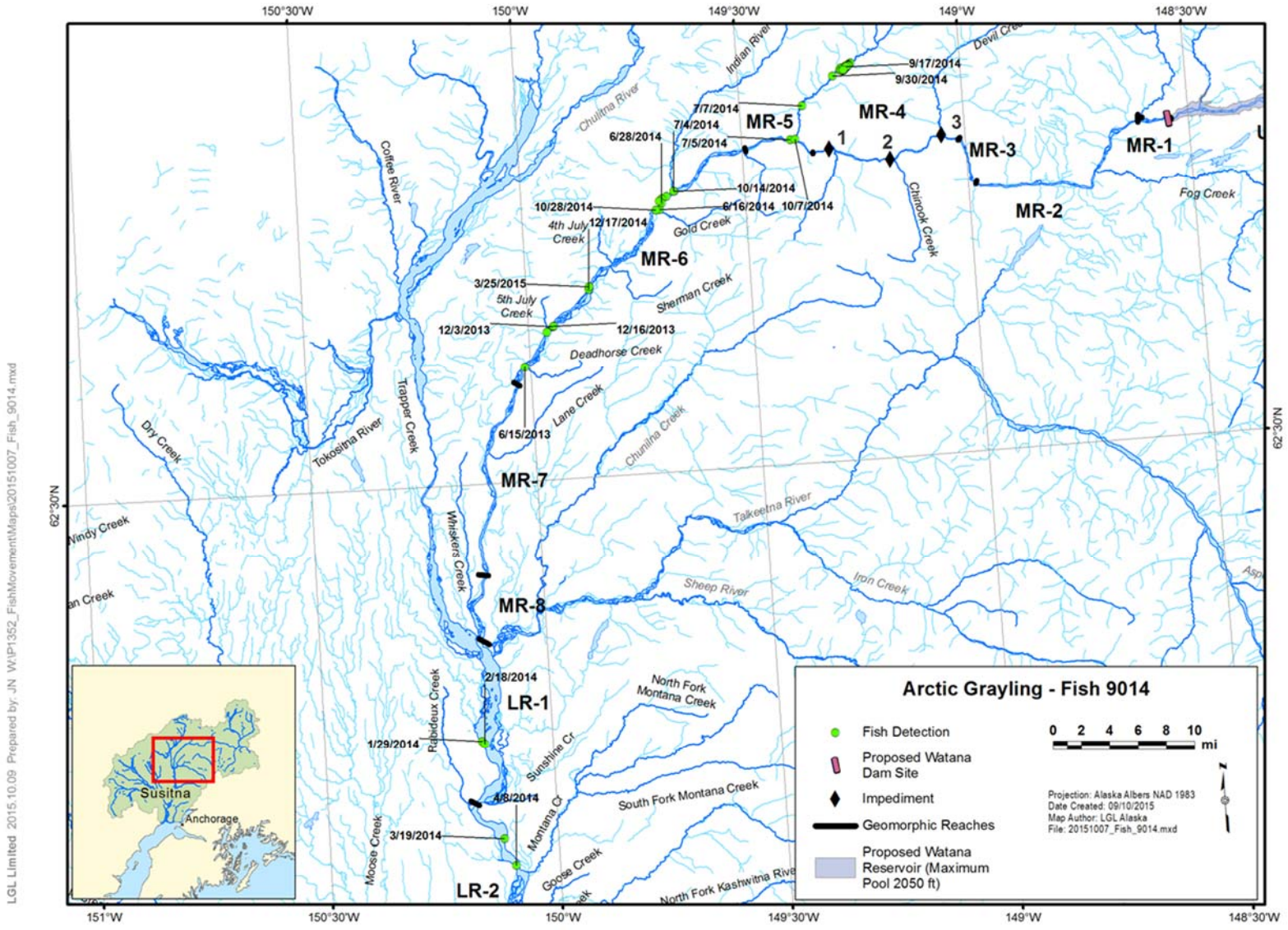

Figure 5.1-13. Tracking history for Fish 9014, an Arctic Grayling tagged in the Middle River.

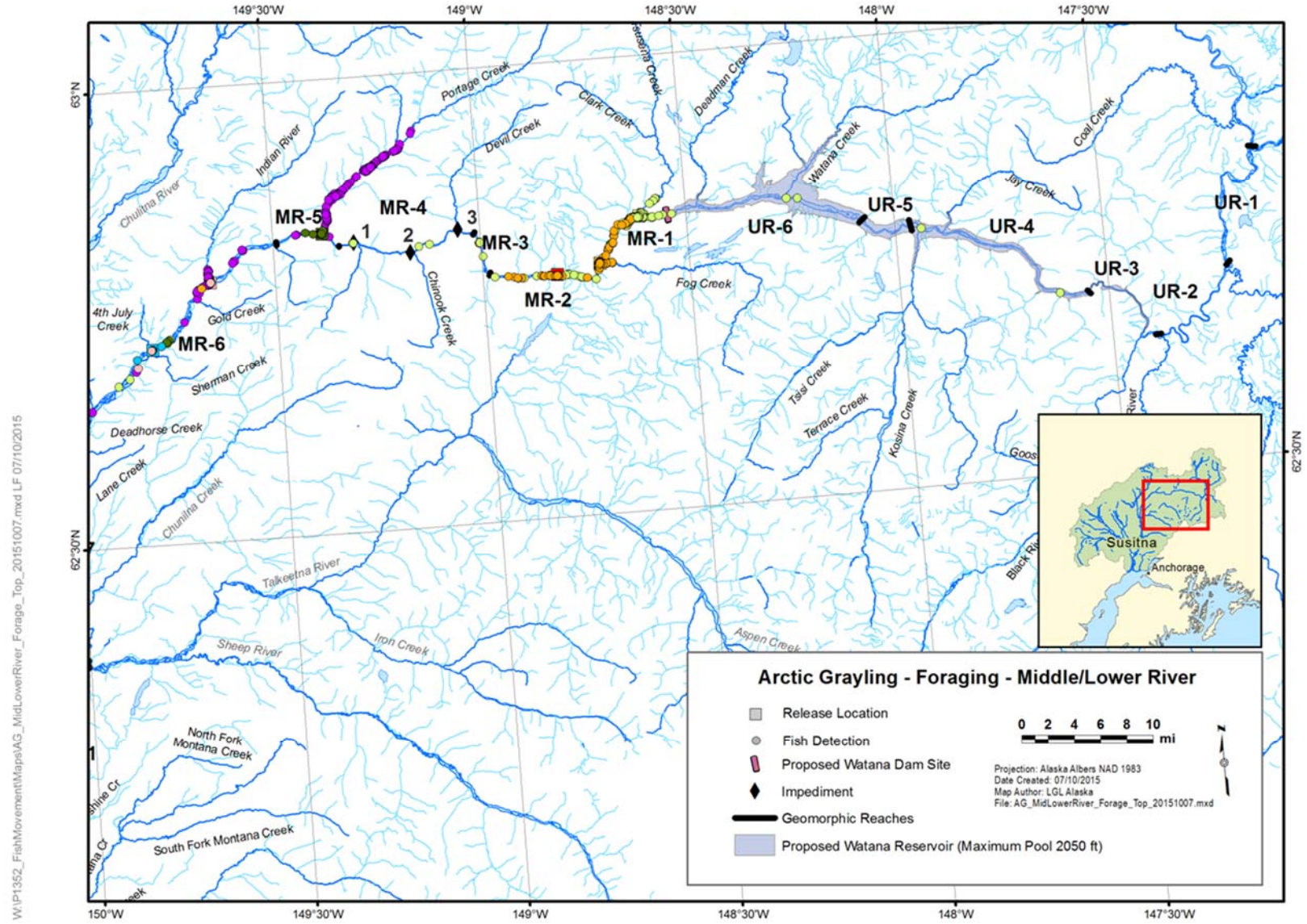

Figure 5.1-14. Locations of Arctic Grayling tagged in the Middle and Lower Susitna River, during the foraging period.

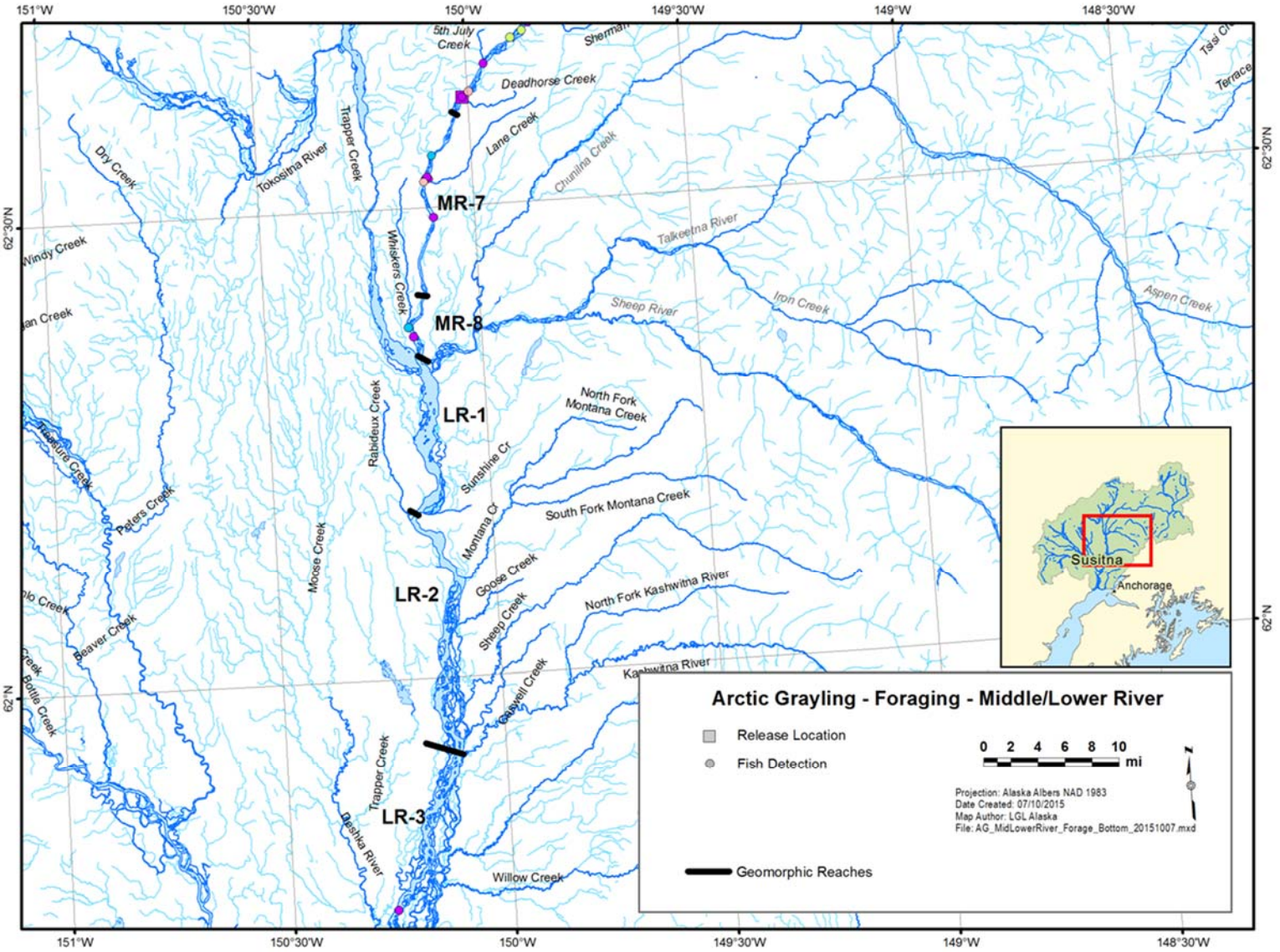

Figure 5.1-15. Locations of Arctic Grayling tagged in the Middle and Lower Susitna River, during the foraging period.

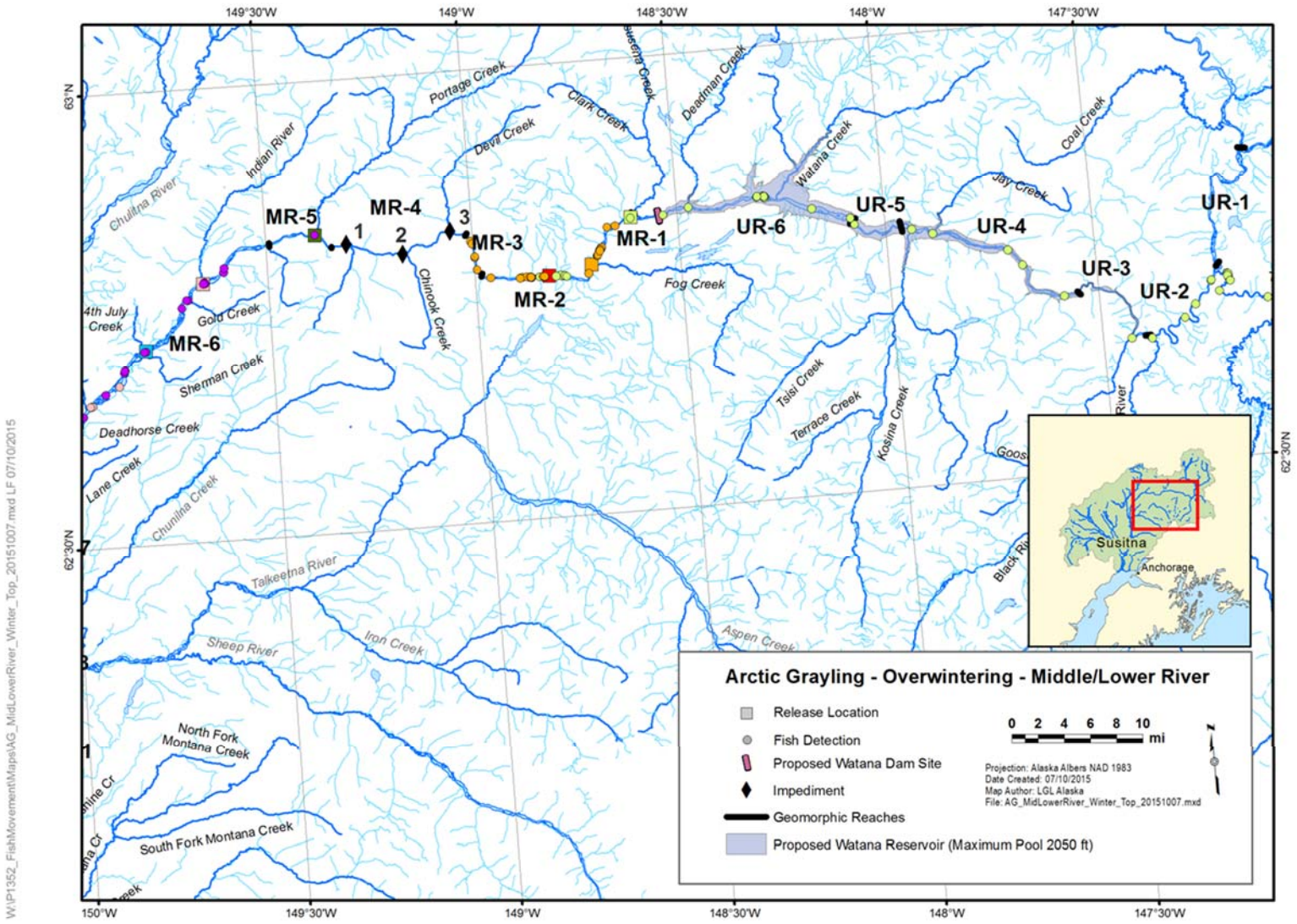

Figure 5.1-16. Locations of Arctic Grayling tagged in the Middle and Lower Susitna River, during the overwintering period. The color of each detection dot matches the color of the location where the fish was released.

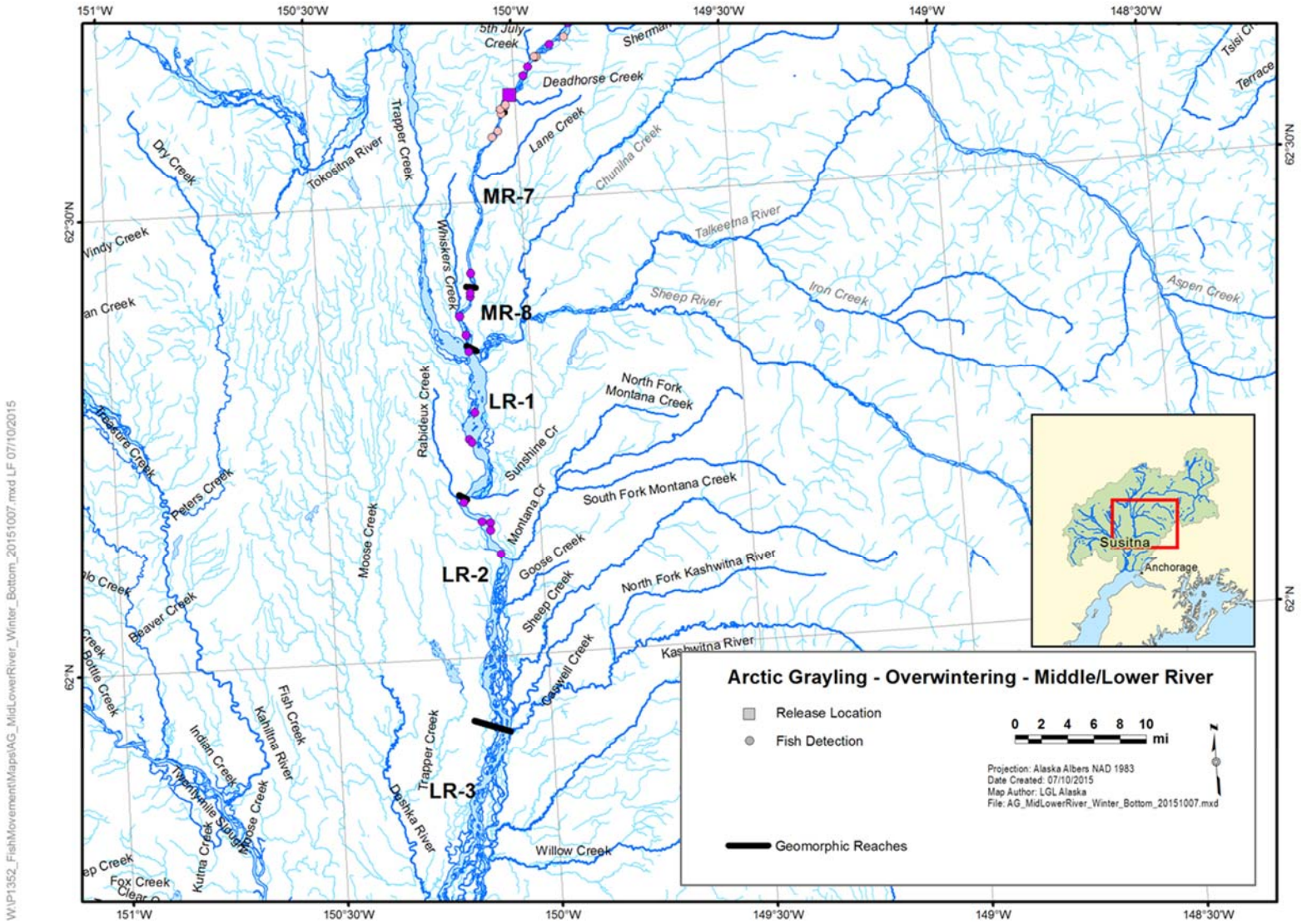

Figure 5.1-17. Locations of Arctic Grayling tagged in the Middle and Lower Susitna River, during the overwintering period. The color of each detection dot matches the color of the location where the fish was released.

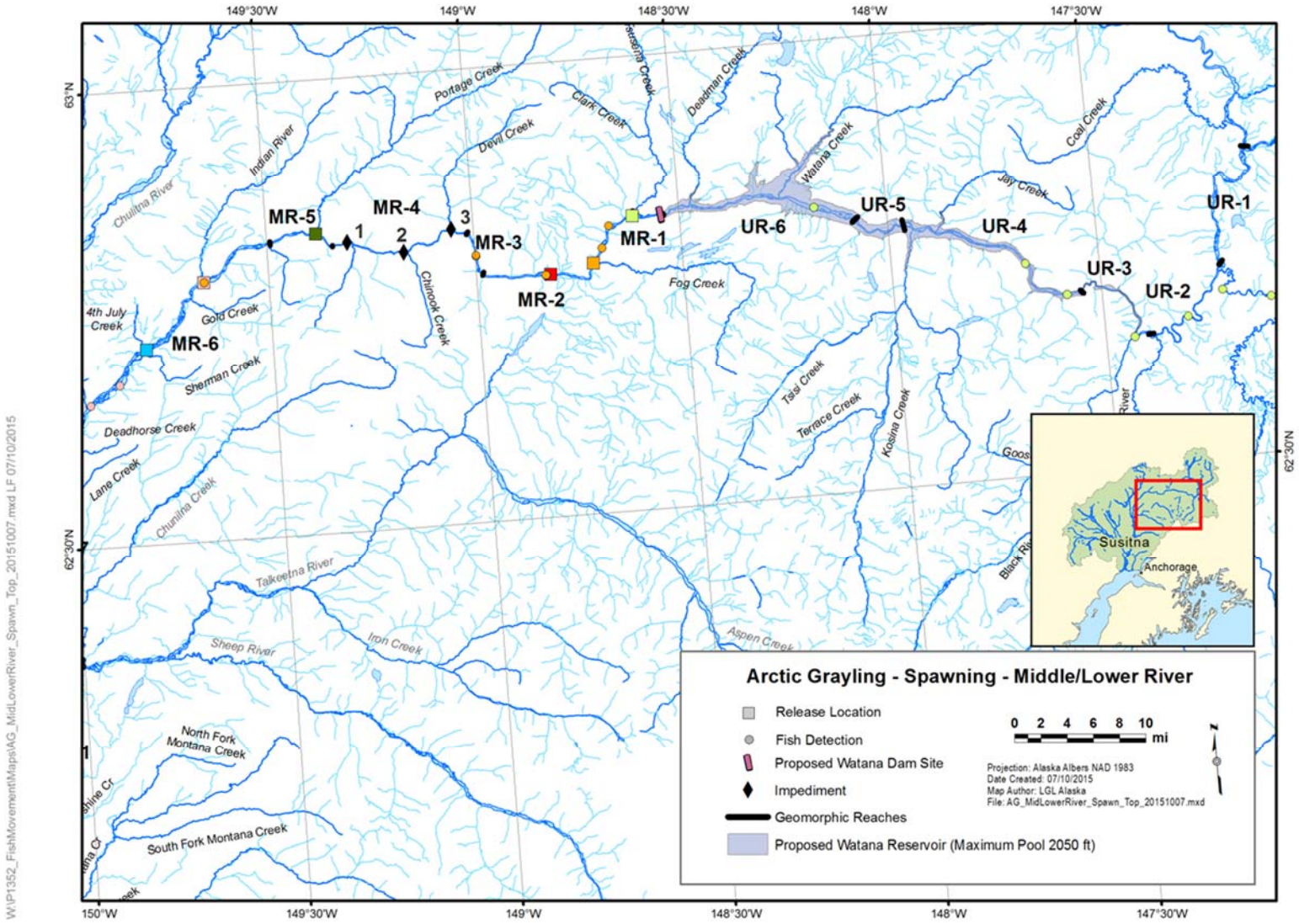

Figure 5.1-18. Locations of Arctic Grayling tagged in the Middle and Lower Susitna River, during the spawning period. The color of each detection dot matches the color of the location where the fish was released.

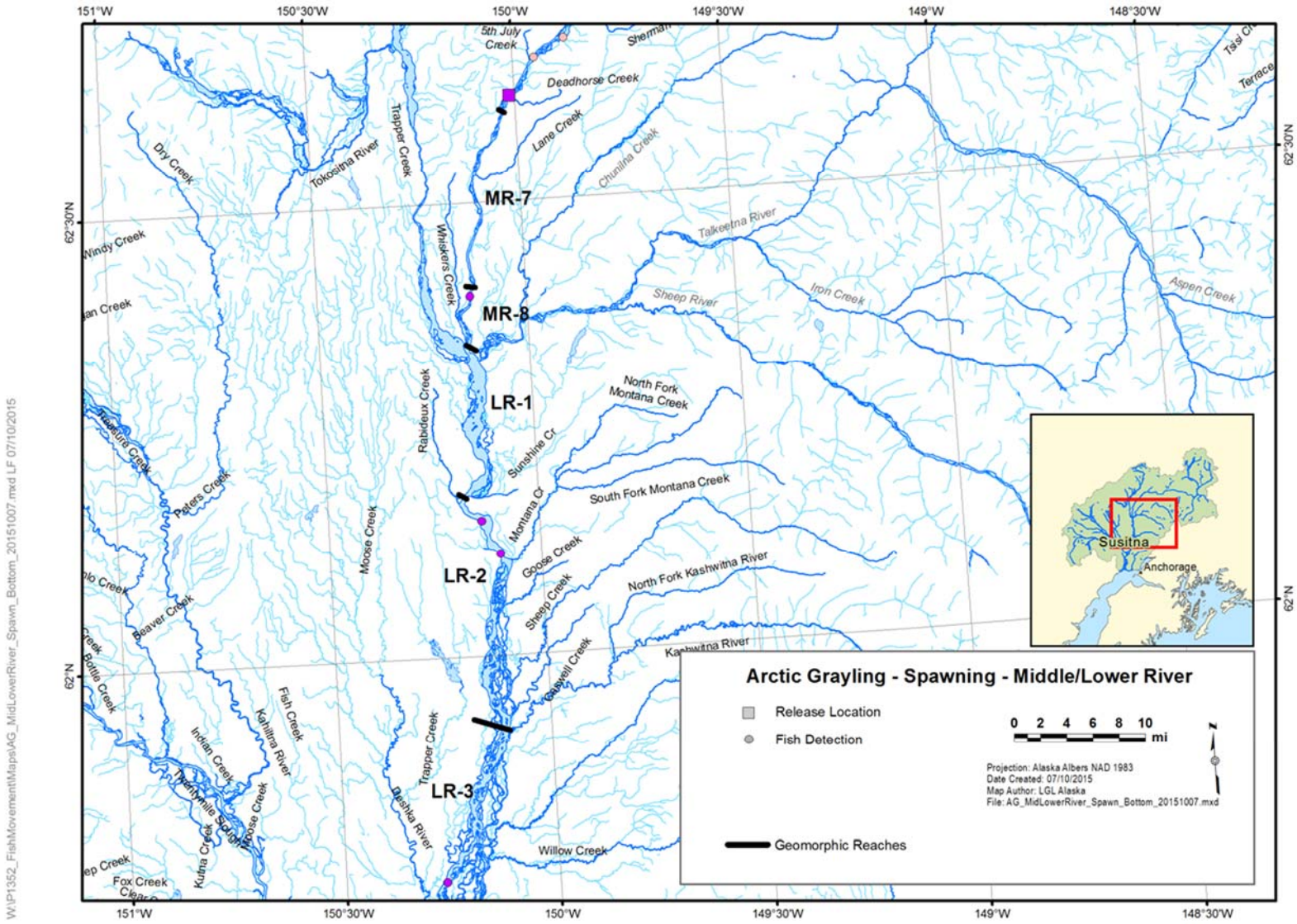

Figure 5.1-19. Locations of Arctic Grayling tagged in the Middle and Lower Susitna River, during the spawning period. The color of each detection dot matches the color of the location where the fish was released.

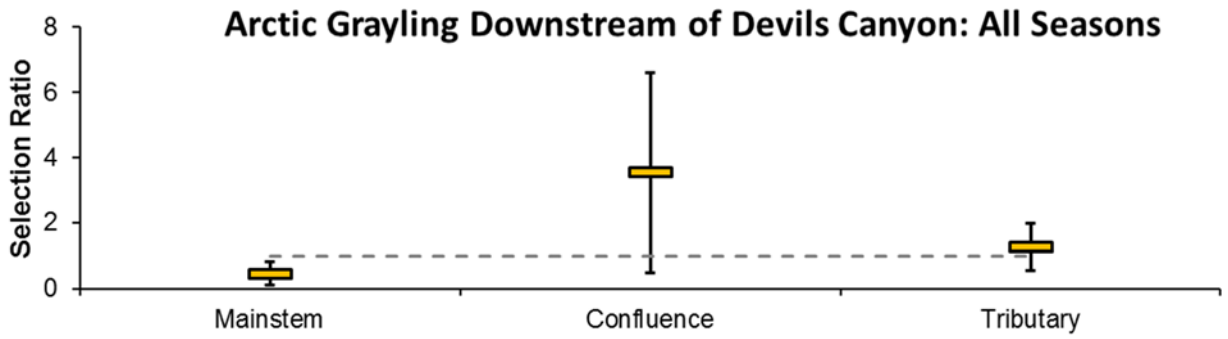

Figure 5.1-20. Selection ratios with 95% Bonferroni confidence intervals for Arctic Grayling tagged downstream of Devils Canyon.

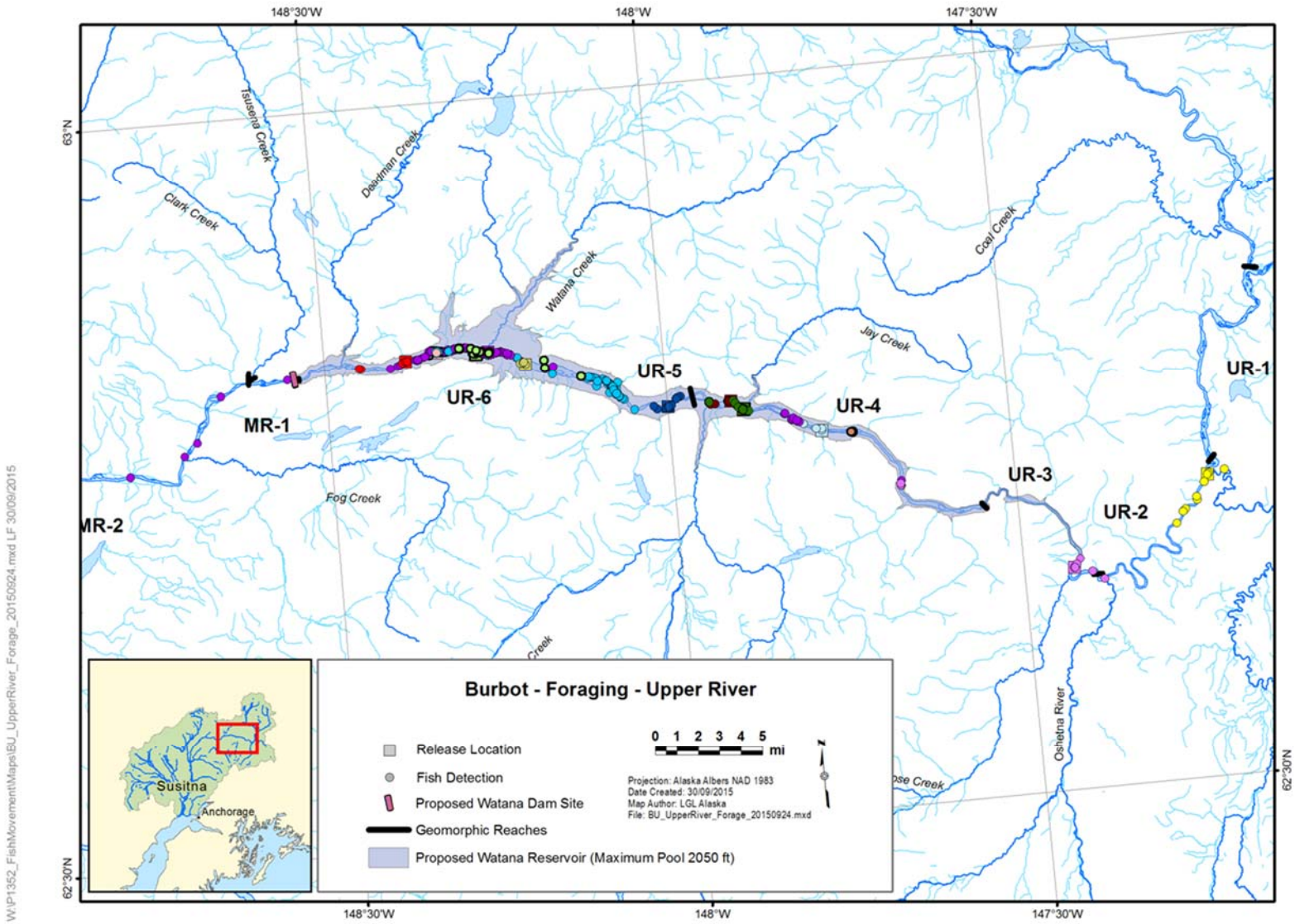

Figure 5.2-1. Locations of Burbot tagged in the Upper Susitna River, during the foraging period. The color of each detection dot matches the color of the location where the fish was released.

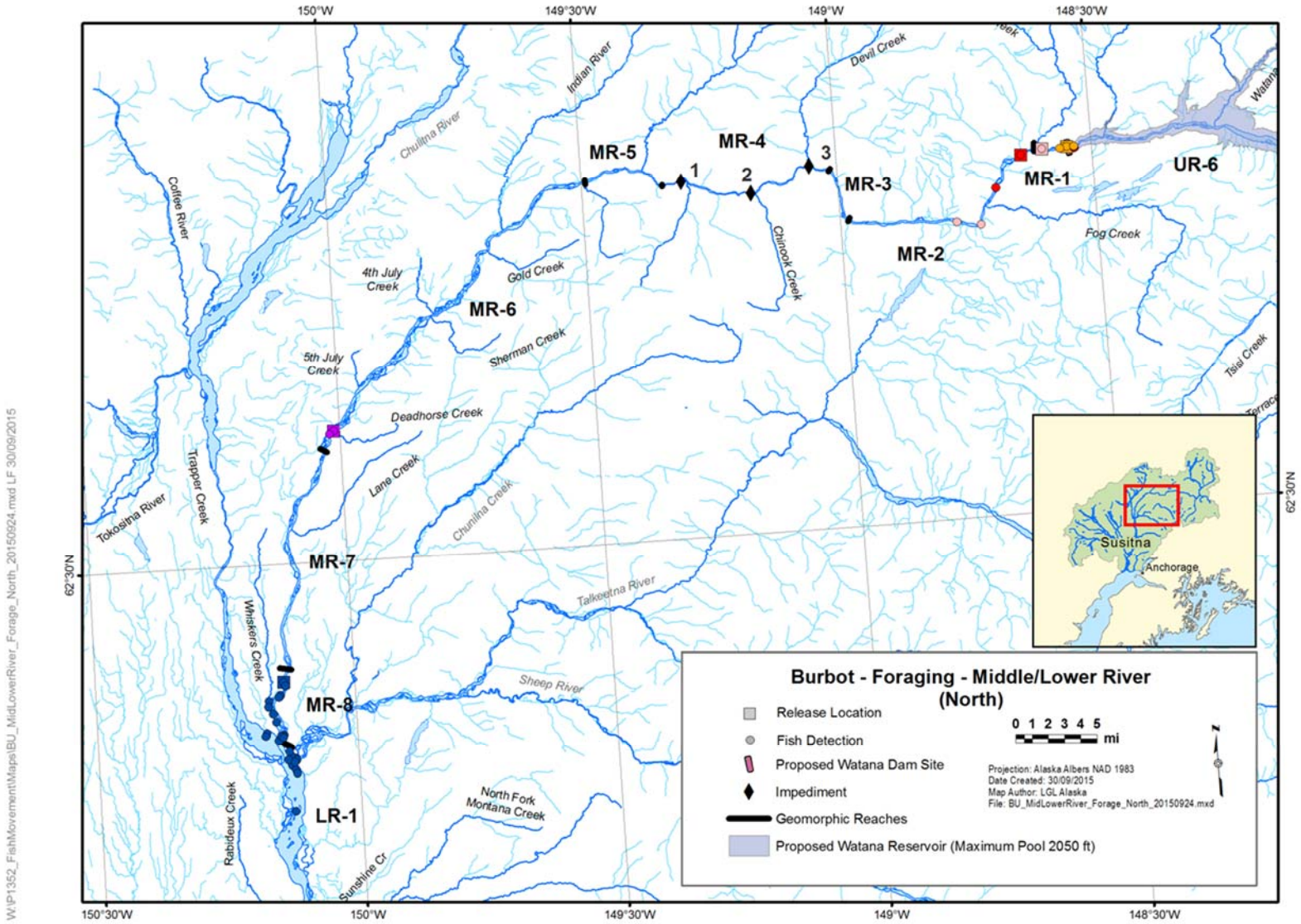

Figure 5.2-2. Locations of Burbot tagged in the Middle and Lower River, during the foraging period. The color of each detection dot matches the color of the location where the fish was released.

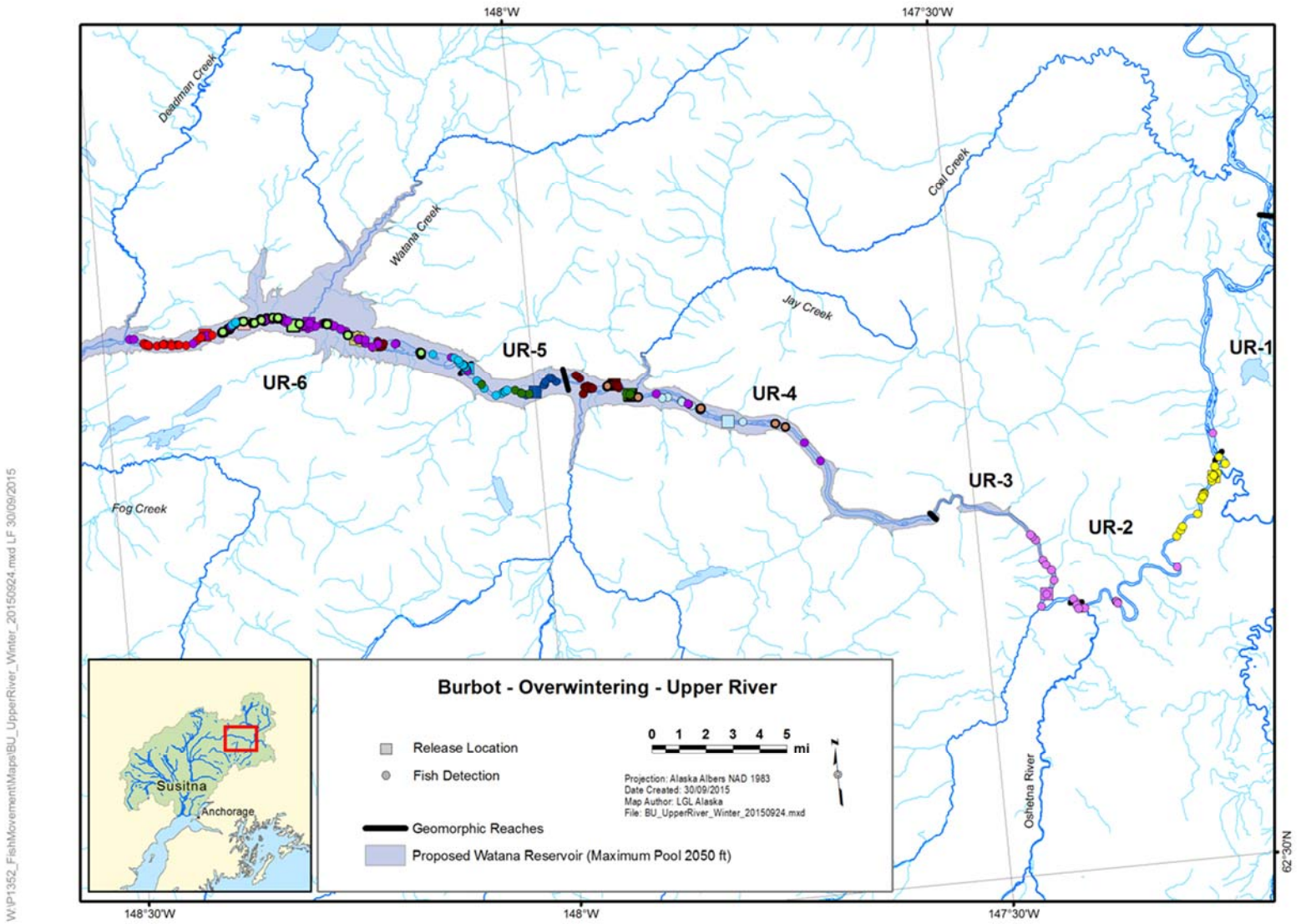

Figure 5.2-3. Locations of Burbot tagged in the Upper Susitna River, during the overwintering period. The color of each detection dot matches the color of the location where the fish was released.

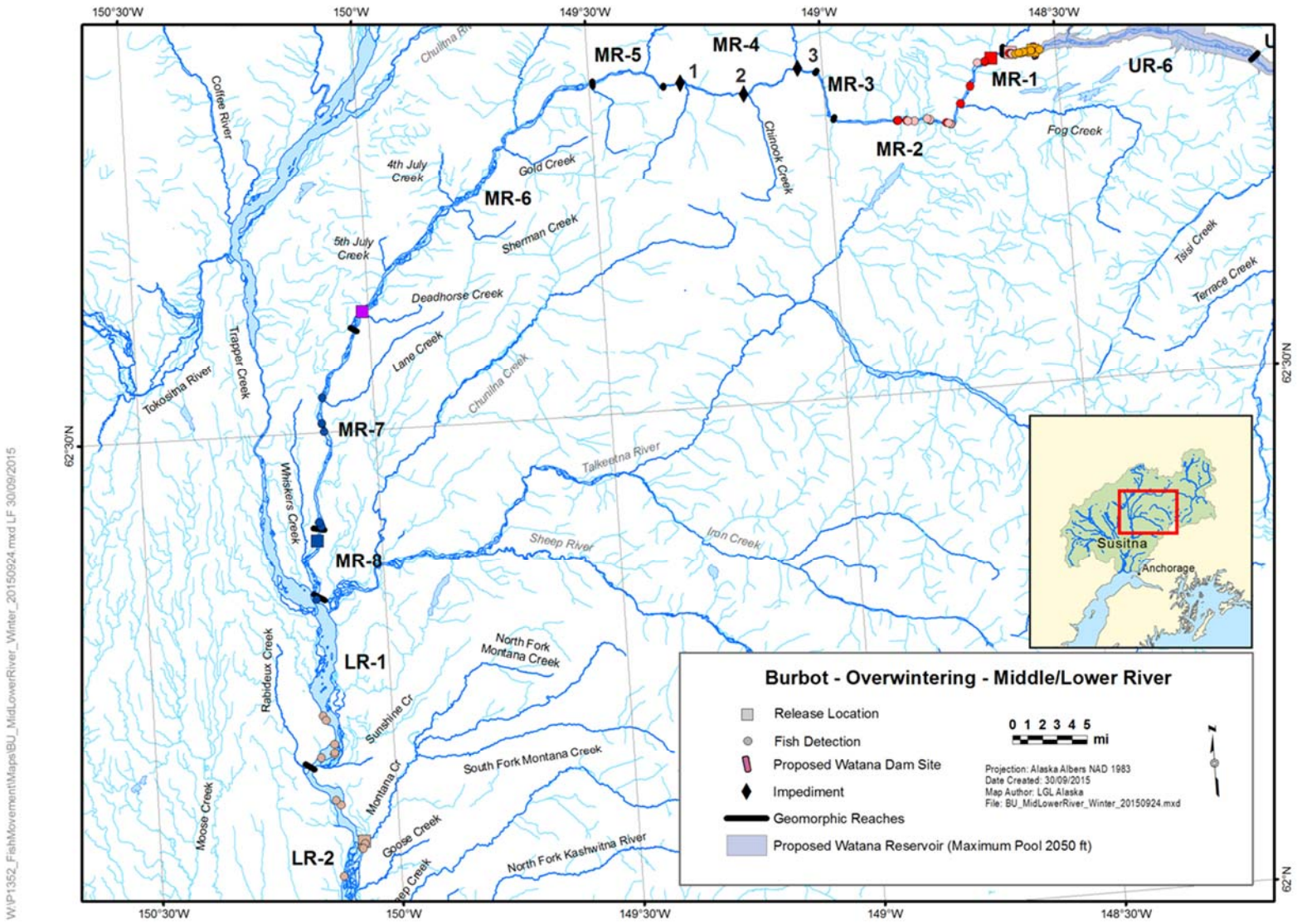

Figure 5.2-4. Locations of Burbot tagged in the Middle and Lower Susitna River, during the overwintering period. The color of each detection dot matches the color of the location where the fish was released.

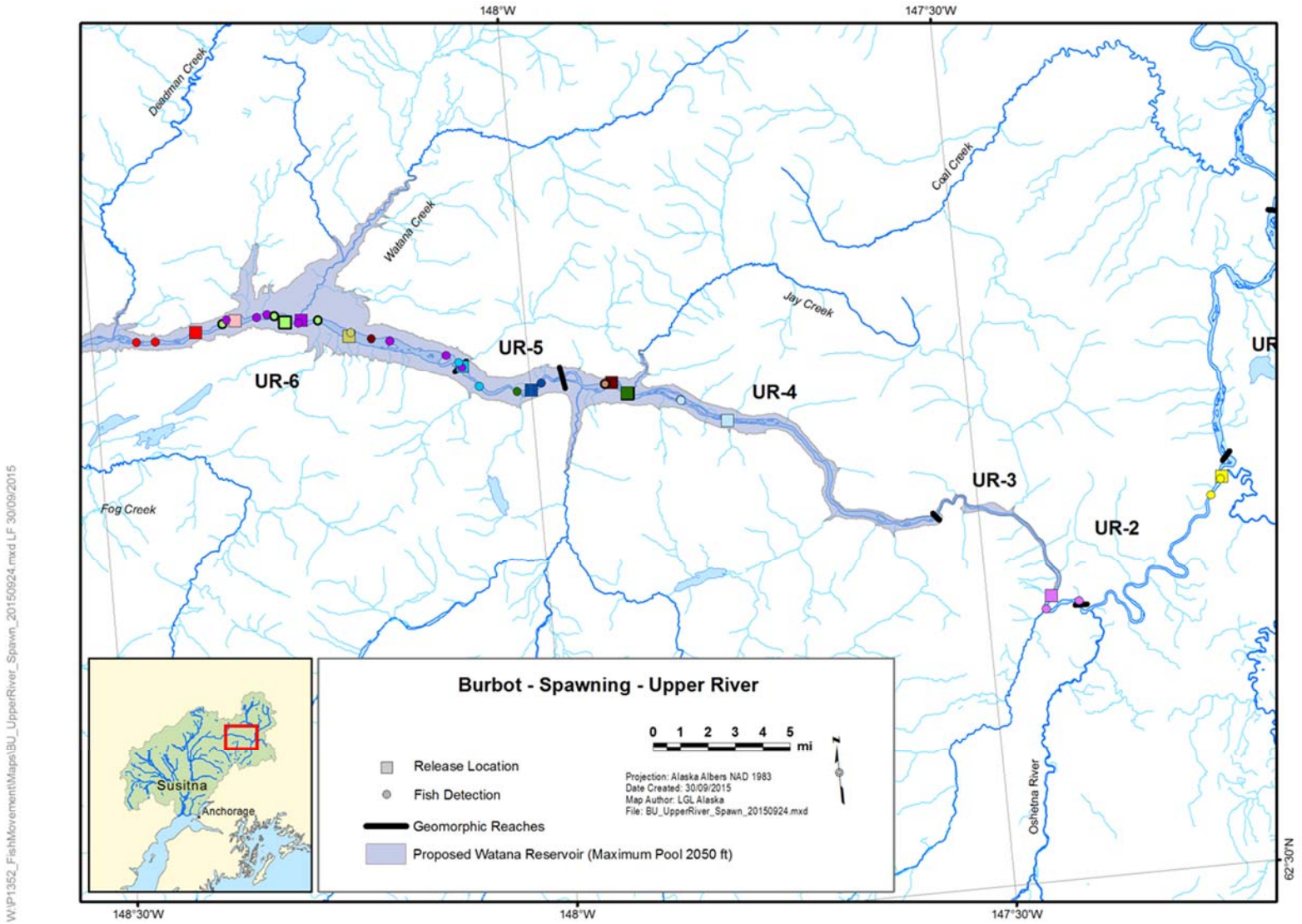

Figure 5.2-5. Locations of Burbot tagged in the Upper Susitna River, during the spawning period. The color of each detection dot matches the color of the location where the fish was released.

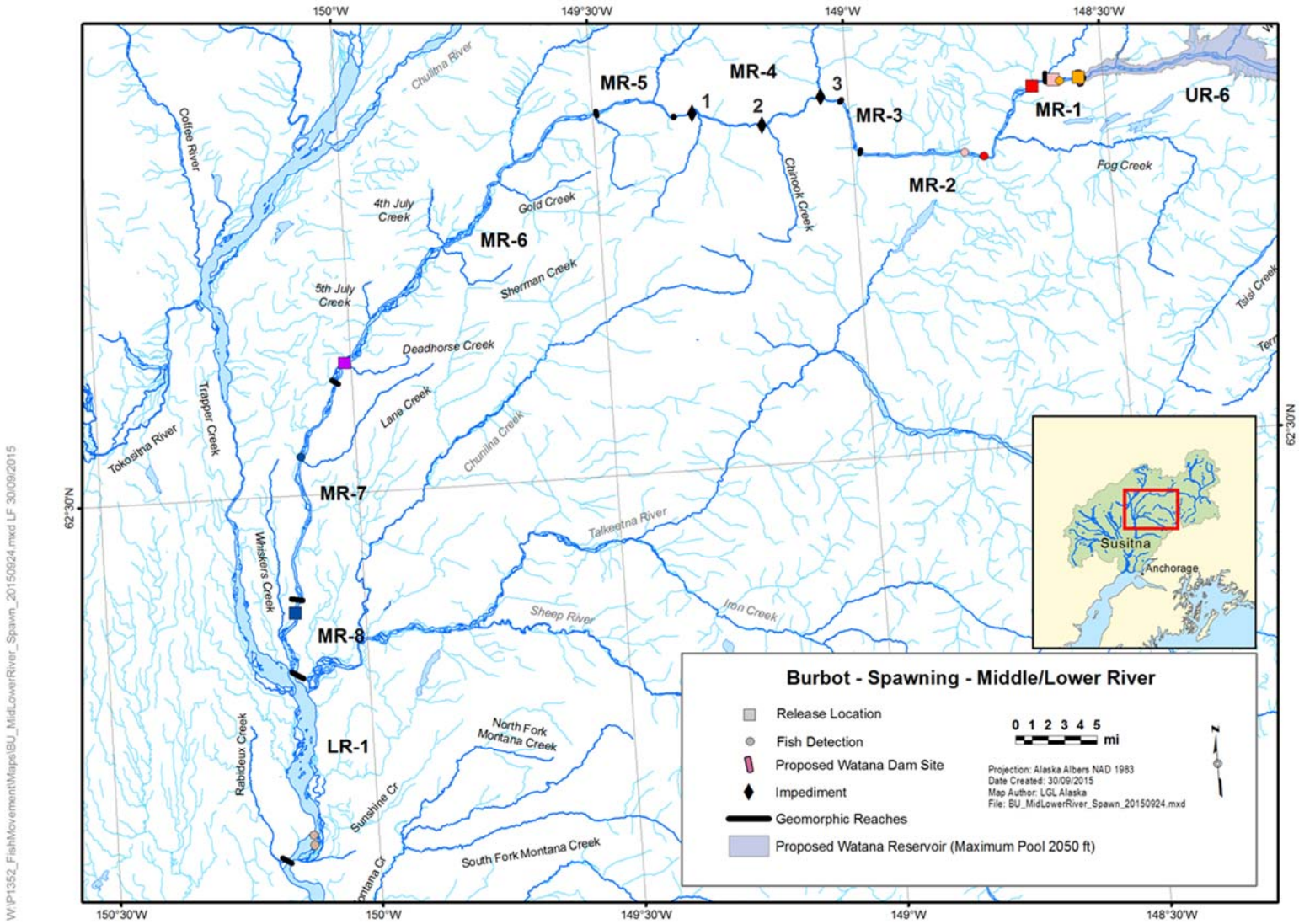

Figure 5.2-6. Locations of Burbot tagged in the Middle and Lower Susitna River, during the spawning period. The color of each detection dot matches the color of the location where the fish was released. Detections near Sunshine Creek were from fish tagged at the mouth of Montana Creek.

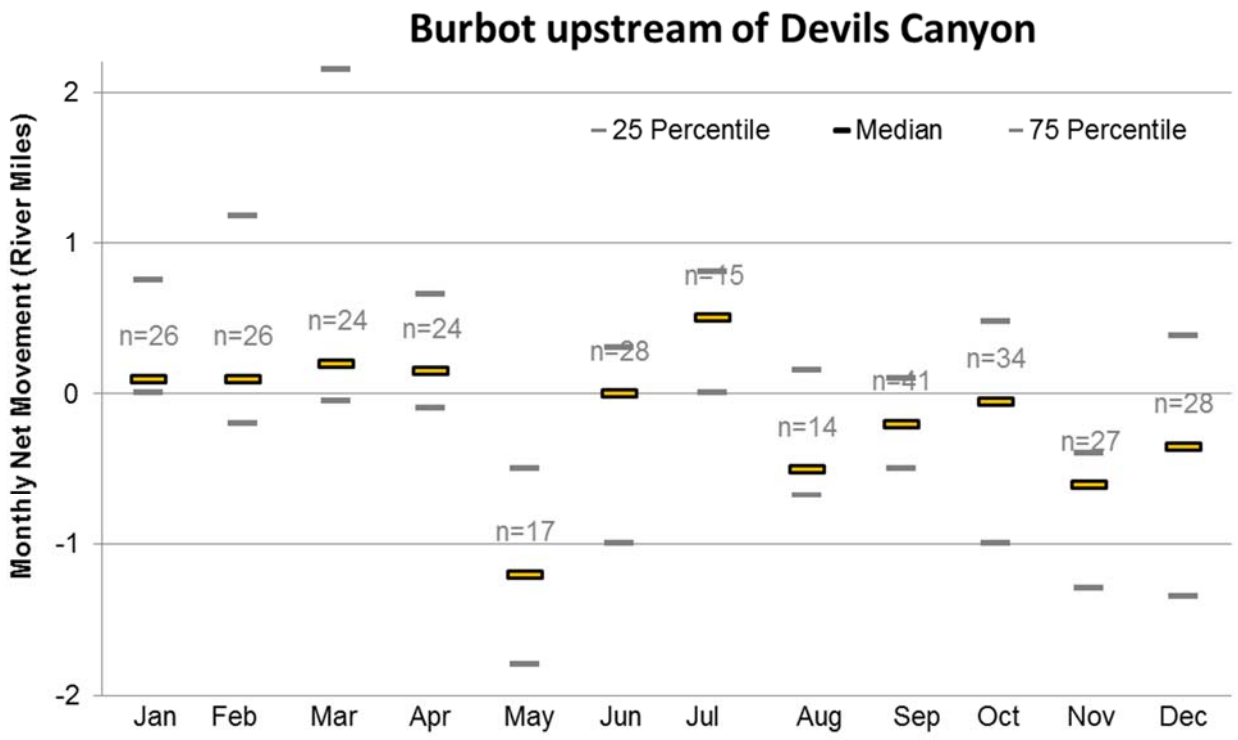

Figure 5.2-7. Net upstream and downstream movements for the tagged population of Burbot upstream of Devils Canyon by study month (n varies by study month from n= 14 in August to n=41 in September).

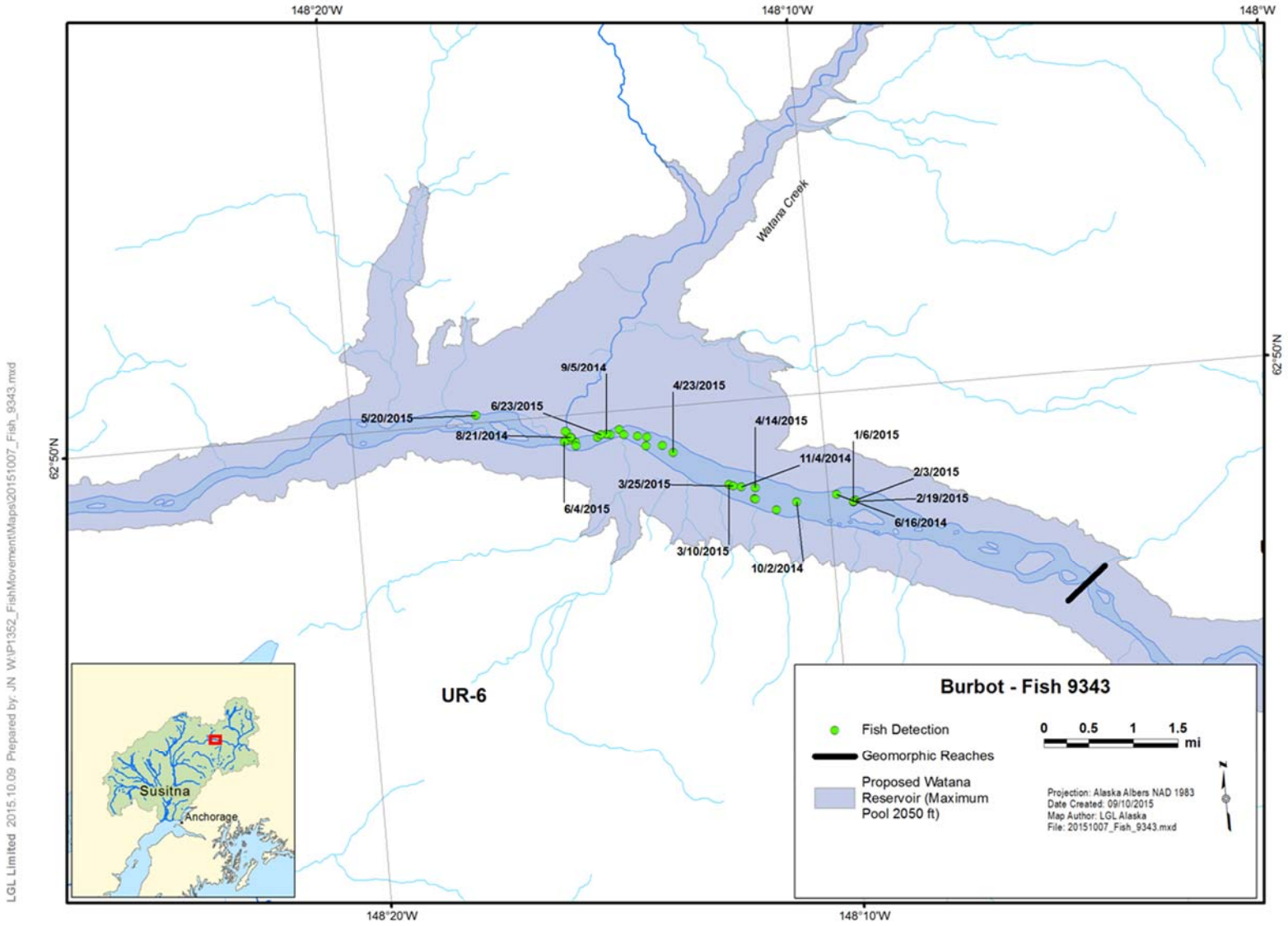

Figure 5.2-8. Tracking history for Fish 9343, a Burbot tagged in the Upper River.

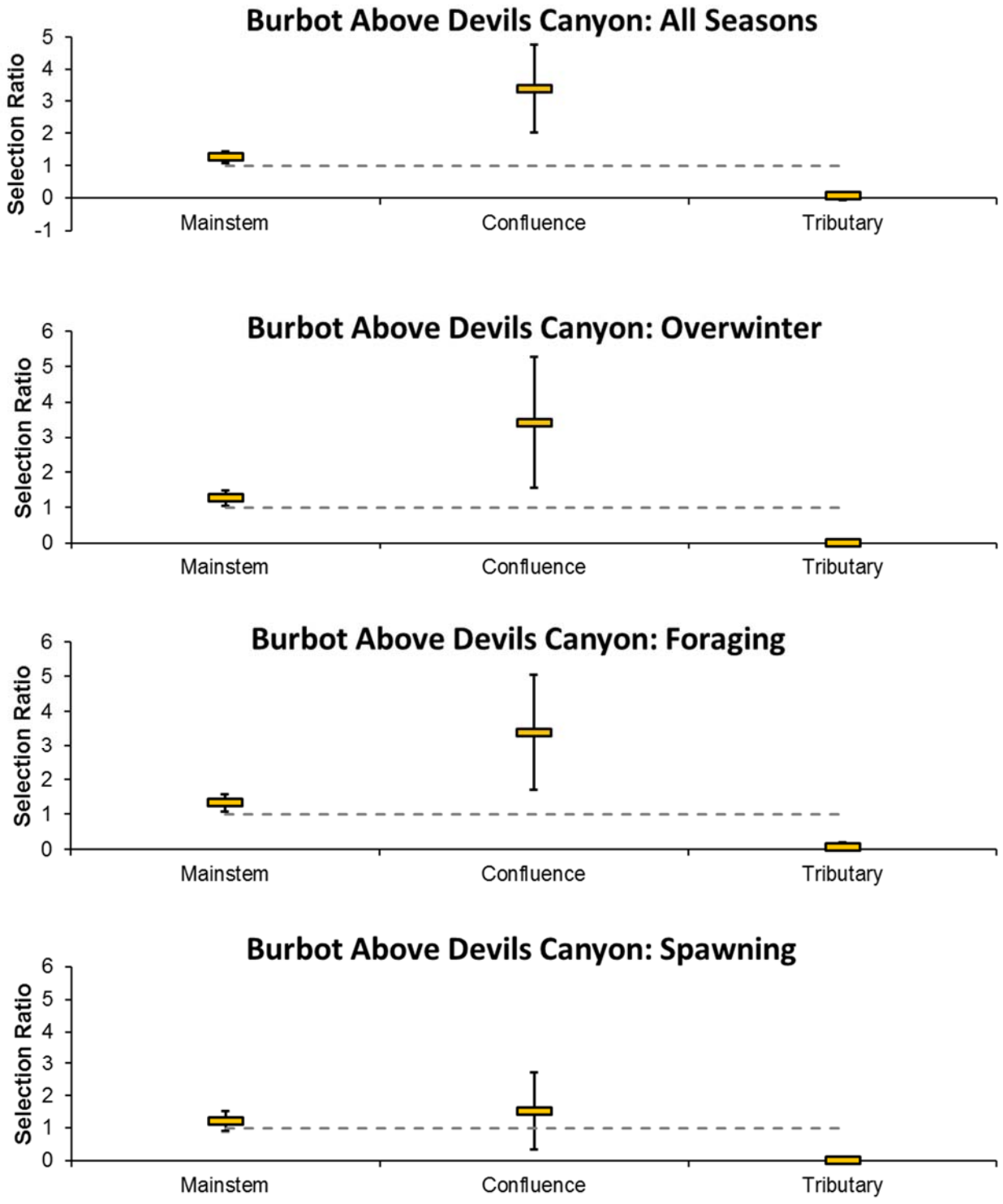

Figure 5.2-9. Habitat selection ratios with 95% Bonferroni confidence intervals for Burbot tagged upstream of Devils Canyon.

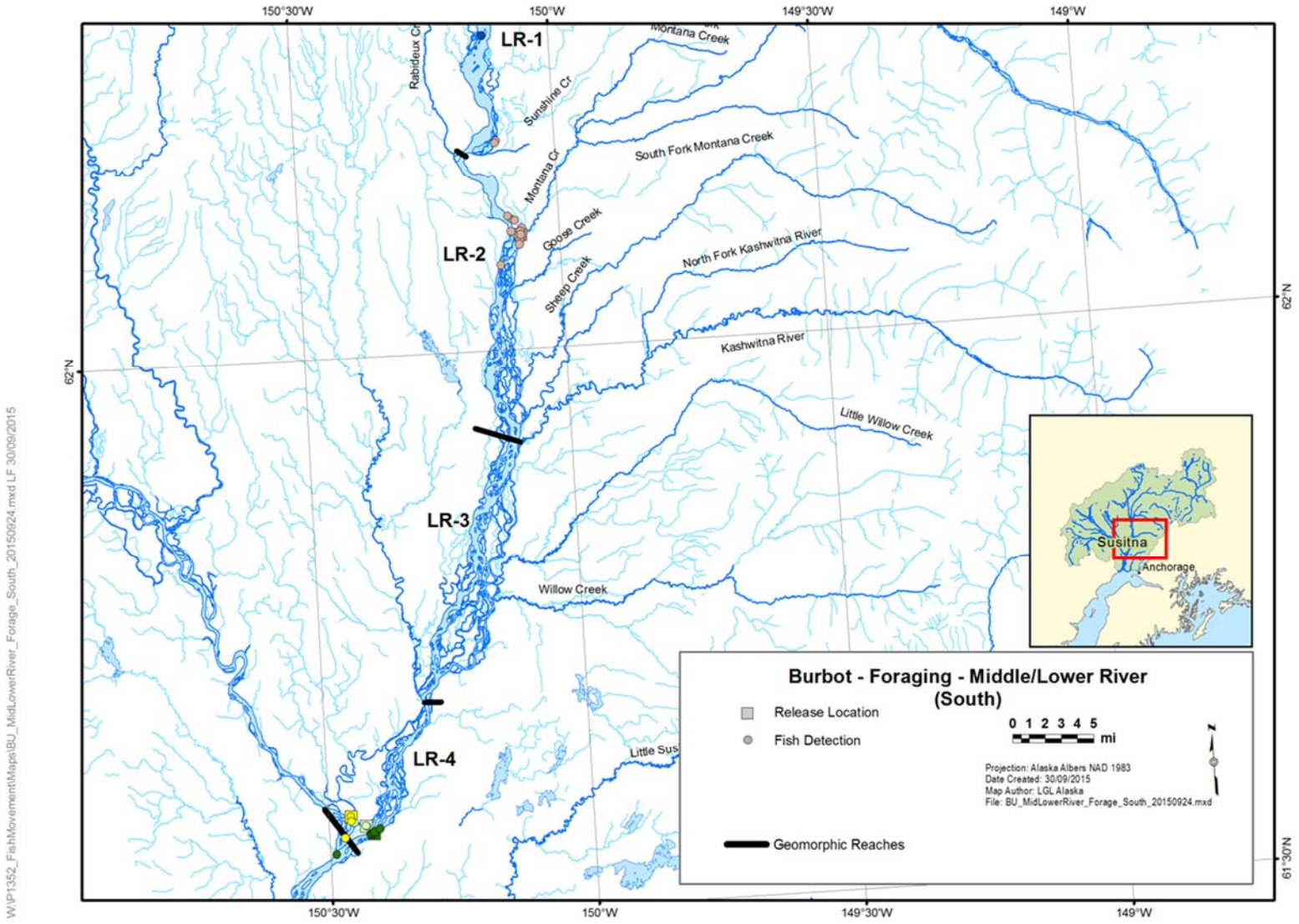

Figure 5.2-10. Locations of Burbot tagged in the Middle and Lower River, during the foraging period. The color of each detection dot matches the color of the location where the fish was released.

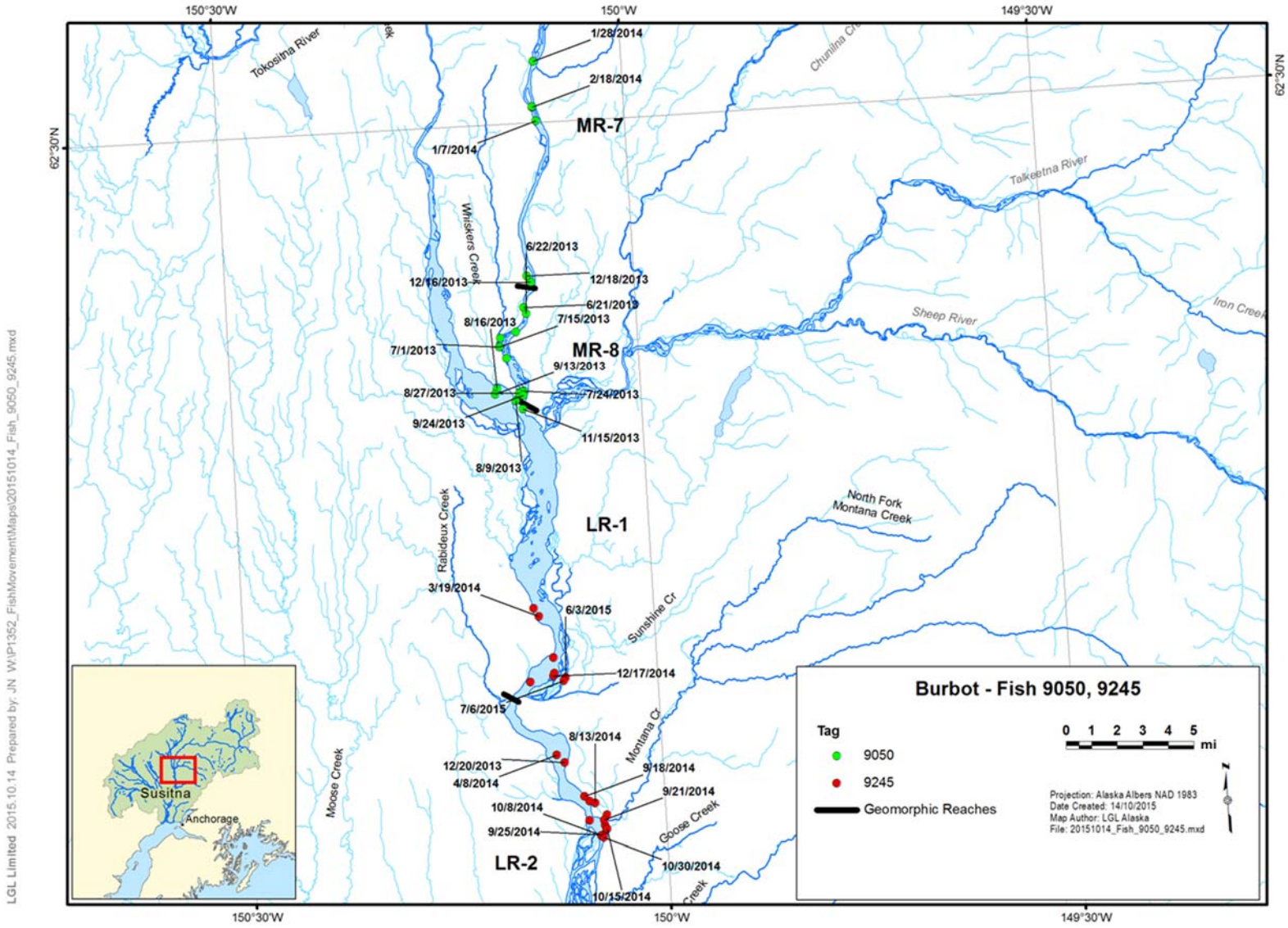

Figure 5.2-11. Tracking history for Fish 9050 and Fish 9245, Burbot tagged in the Middle and Lower River.

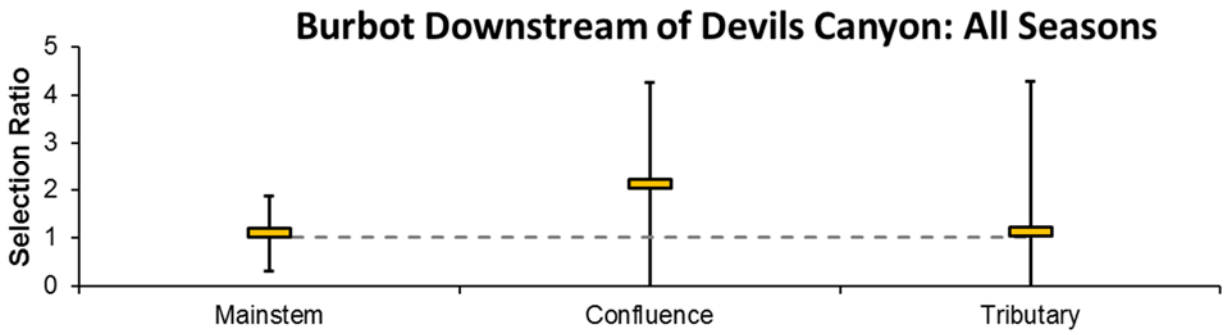

Figure 5.2-12. Selection ratios with 95% Bonferroni confidence intervals for Burbot tagged downstream of Devils Canyon.

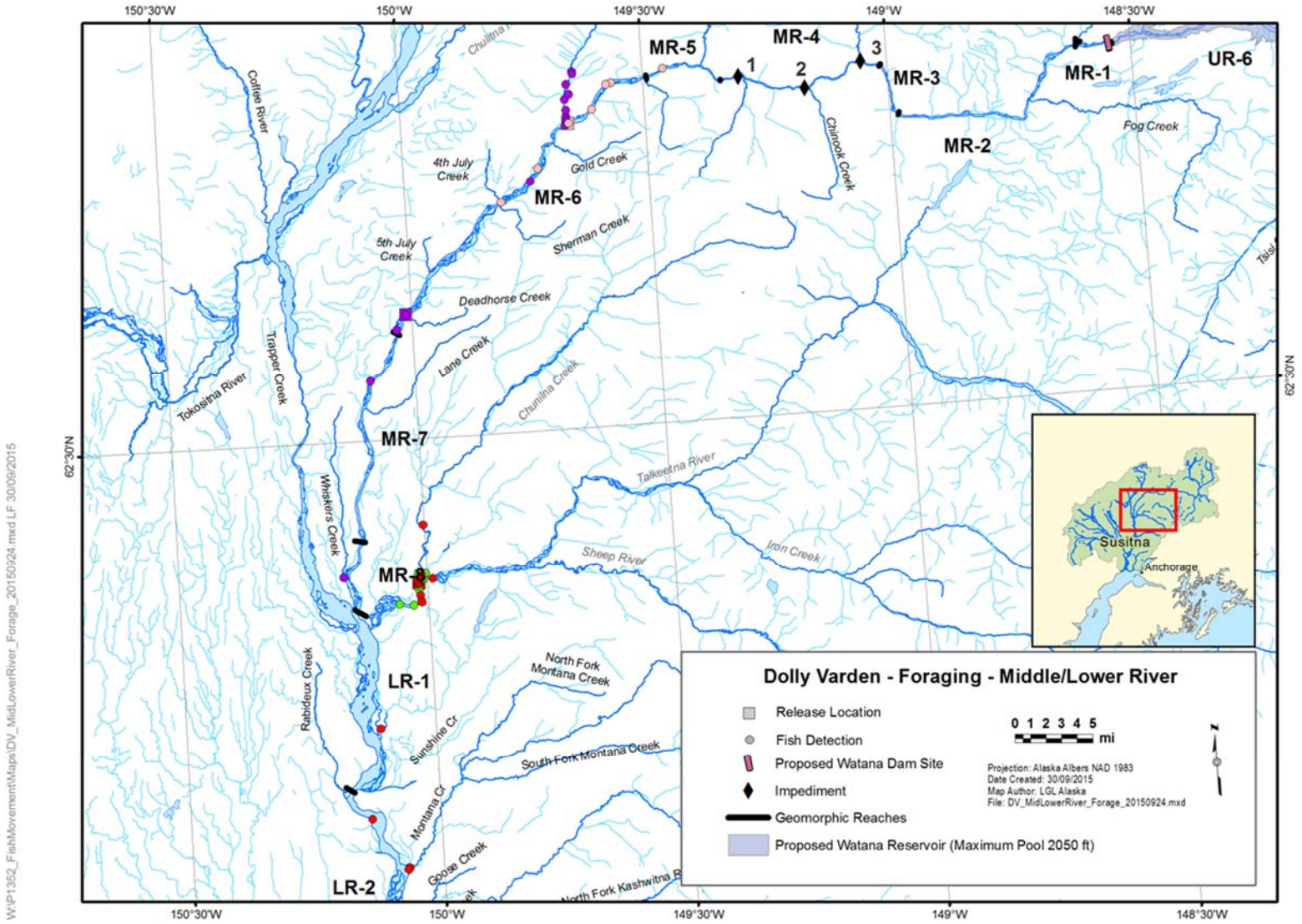

Figure 5.3-1. Locations of Dolly Varden tagged in the Middle and Lower Susitna River, during the foraging period. The color of each detection dot matches the color of the location where the fish was released.

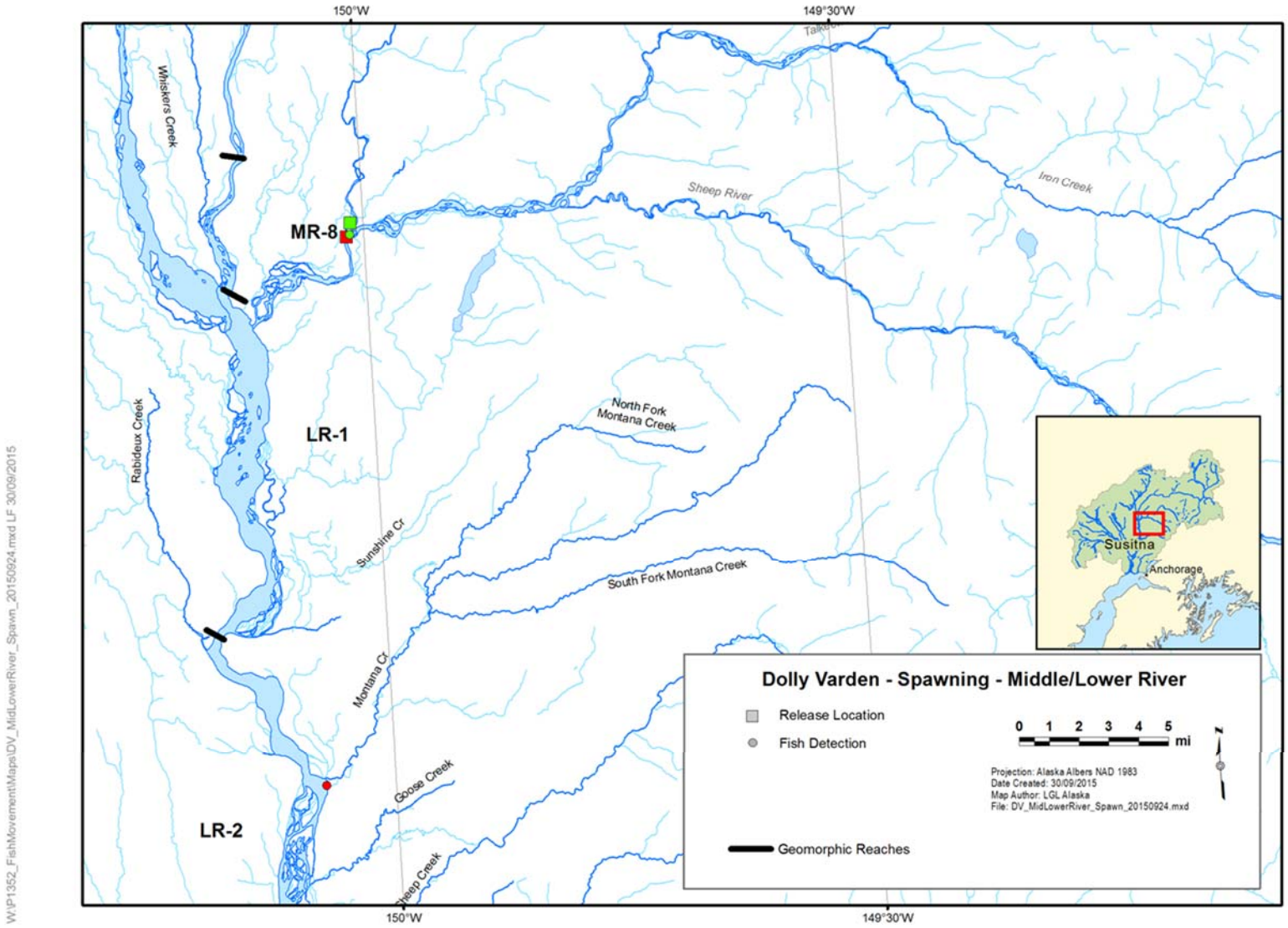

Figure 5.3-2. Locations of Dolly Varden tagged in the Middle and Lower Susitna River, during the spawning period. The color of each detection dot matches the color of the location where the fish was released.

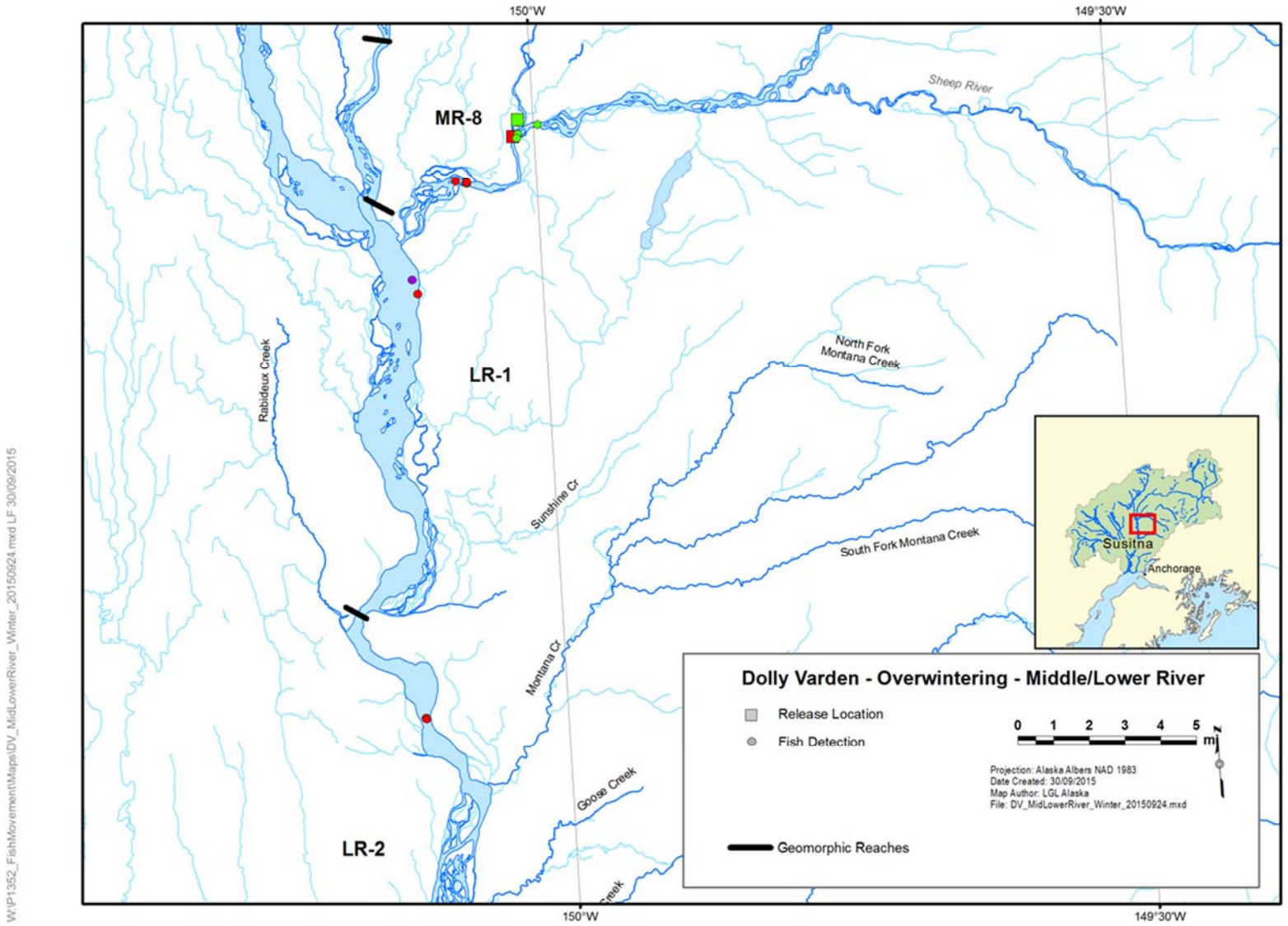

Figure 5.3-3. Locations of Dolly Varden tagged in the Middle and Lower Susitna River, during the overwintering period. The color of each detection dot matches the color of the location where the fish was released.

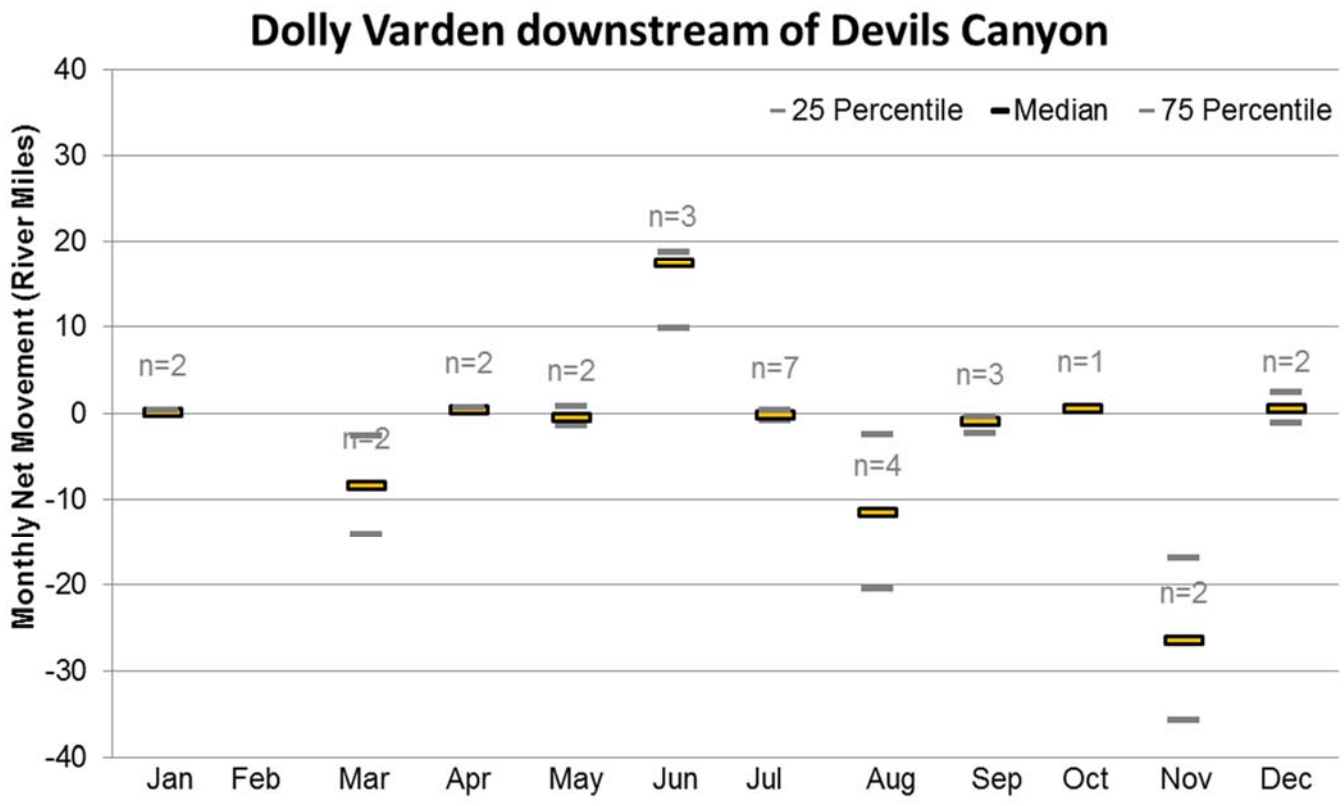

Figure 5.3-4. Net upstream and downstream movements for the tagged population of Dolly Varden downstream of Devils Canyon by study month (n, number of fish detected each month in parenthesis).

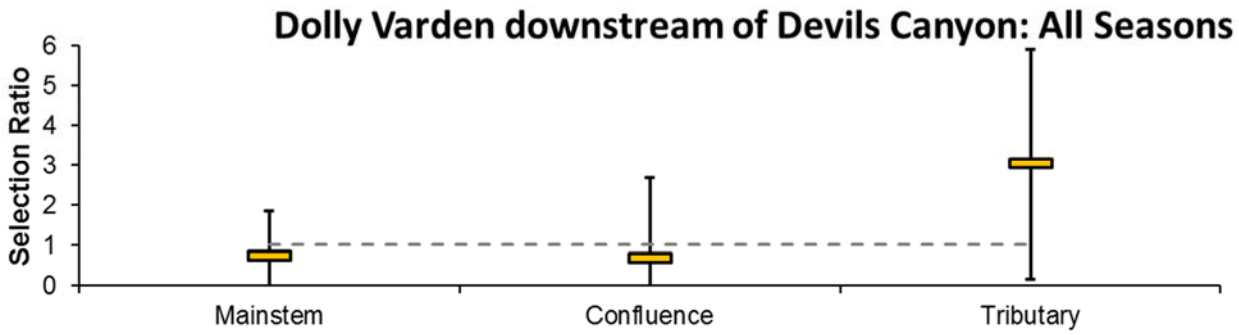

Figure 5.3-5. Selection ratios with 95% Bonferroni confidence intervals for Dolly Varden tagged downstream of Devils Canyon.

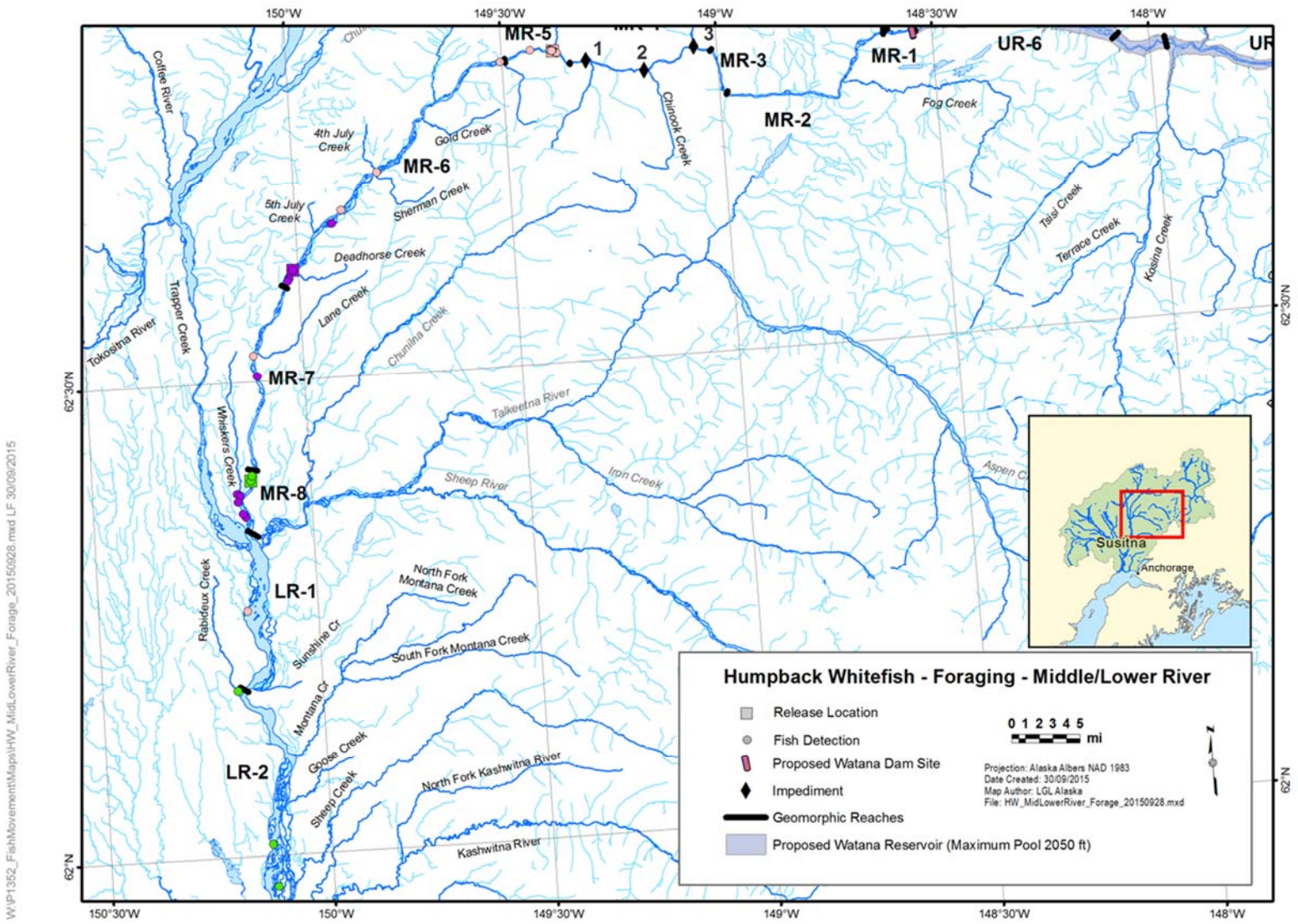

Figure 5.4-1. Locations of Humpback Whitefish tagged in the Middle and Lower Susitna River, during the foraging period. The color of each detection dot matches the color of the location where the fish was released.

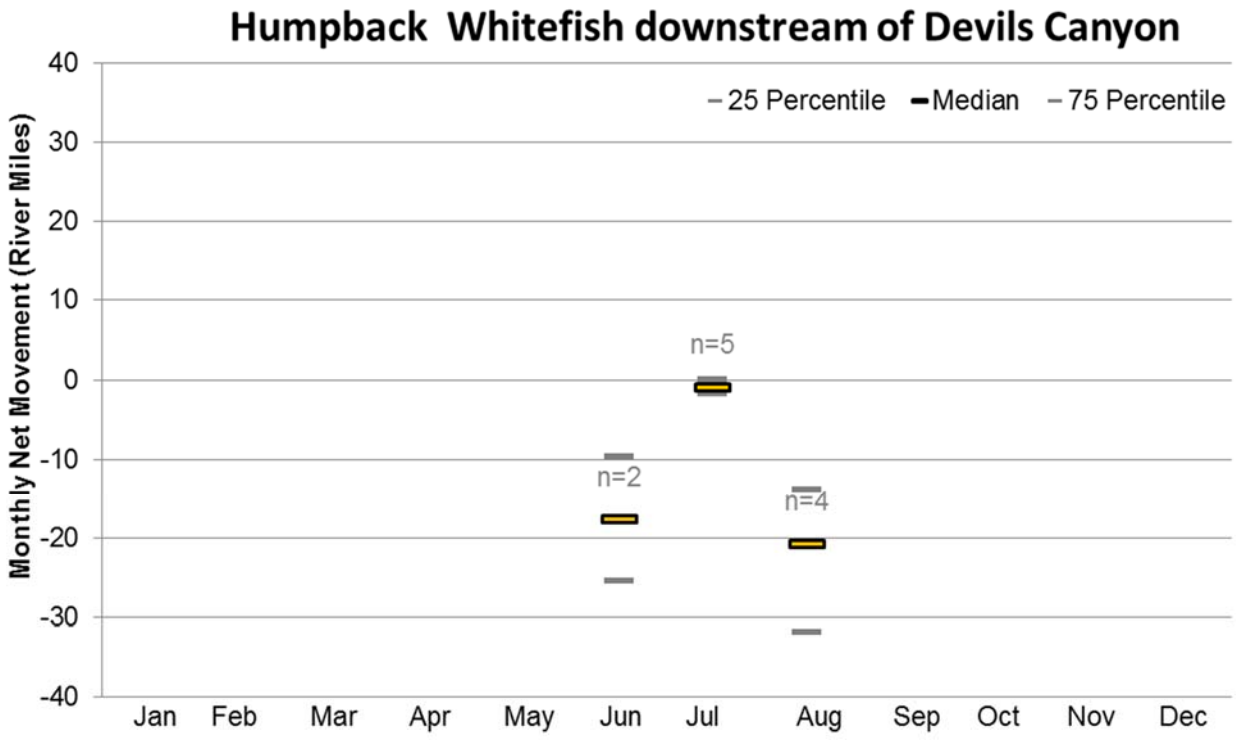

Figure 5.4-2. Net upstream and downstream movements for the tagged population of Humpback Whitefish downstream of Devils Canyon by study month (n, number of fish detected each month).

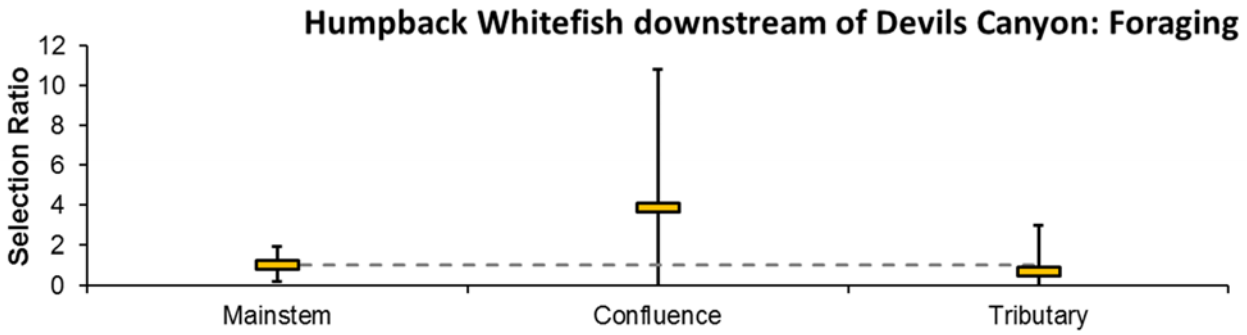

Figure 5.4-3. Habitat selection ratio with 95% Bonferroni confidence intervals for Humpback Whitefish tagged downstream of Devils Canyon.

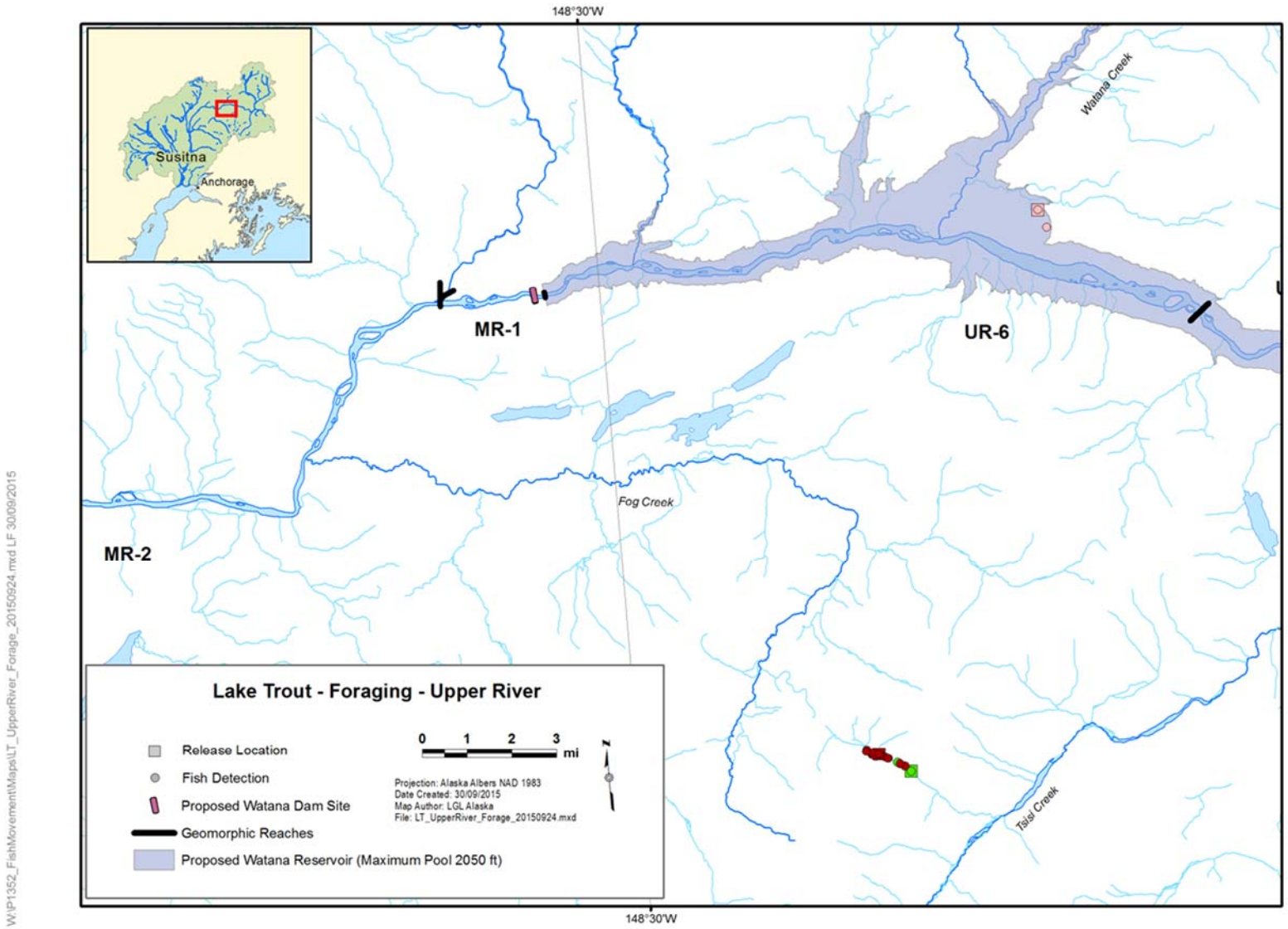

Figure 5.5-1. Locations of Lake Trout tagged in the Upper Susitna River, during the foraging period. The color of each detection dot matches the color of the location where the fish was released.

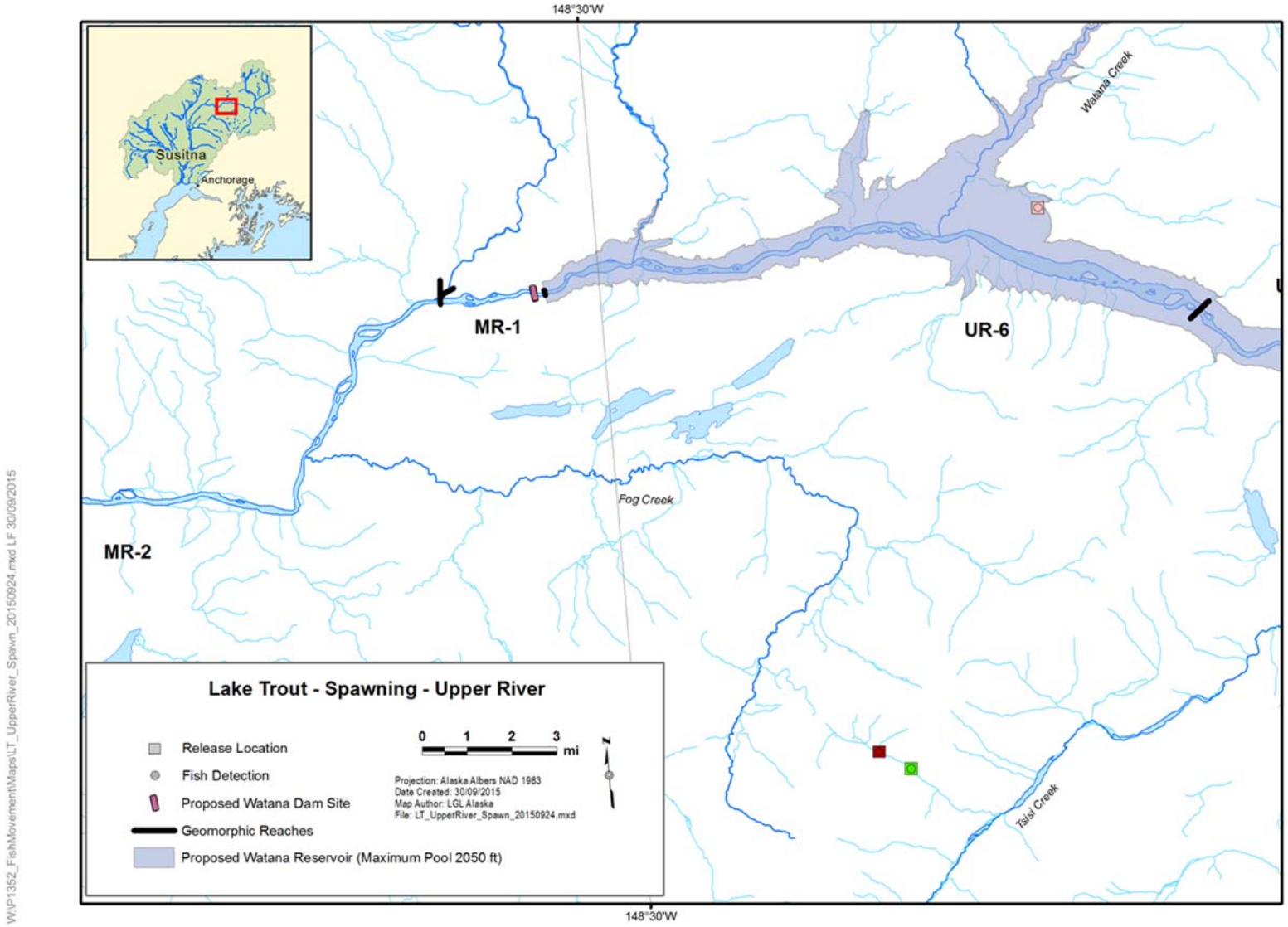

Figure 5.5-2. Locations of Lake Trout tagged in the Upper Susitna River, during the spawning period. The color of each detection dot matches the color of the location where the fish was released.

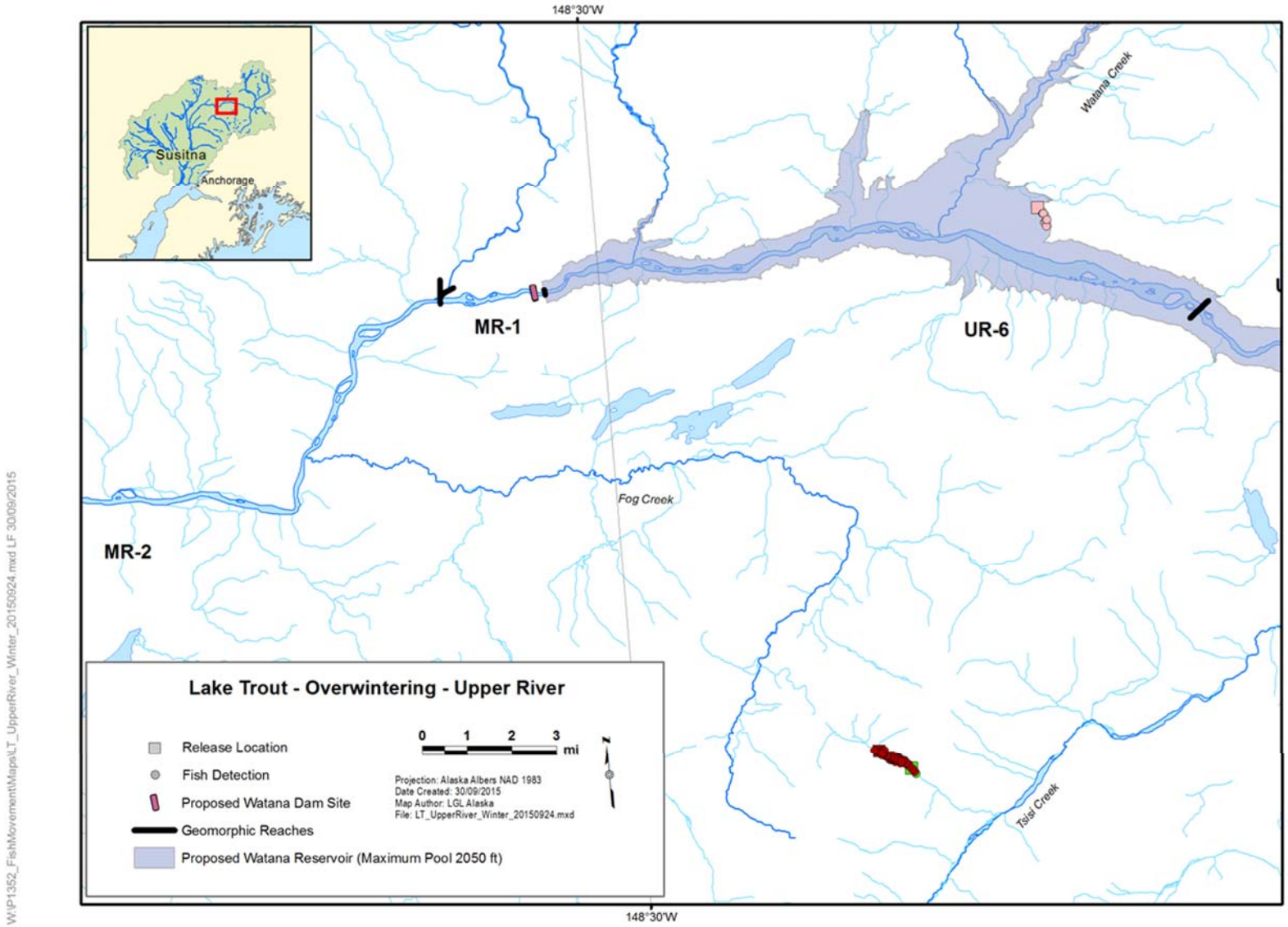

Figure 5.5-3. Locations of Lake Trout tagged in the Upper Susitna River, during the overwintering period. The color of each detection dot matches the color of the location where the fish was released.

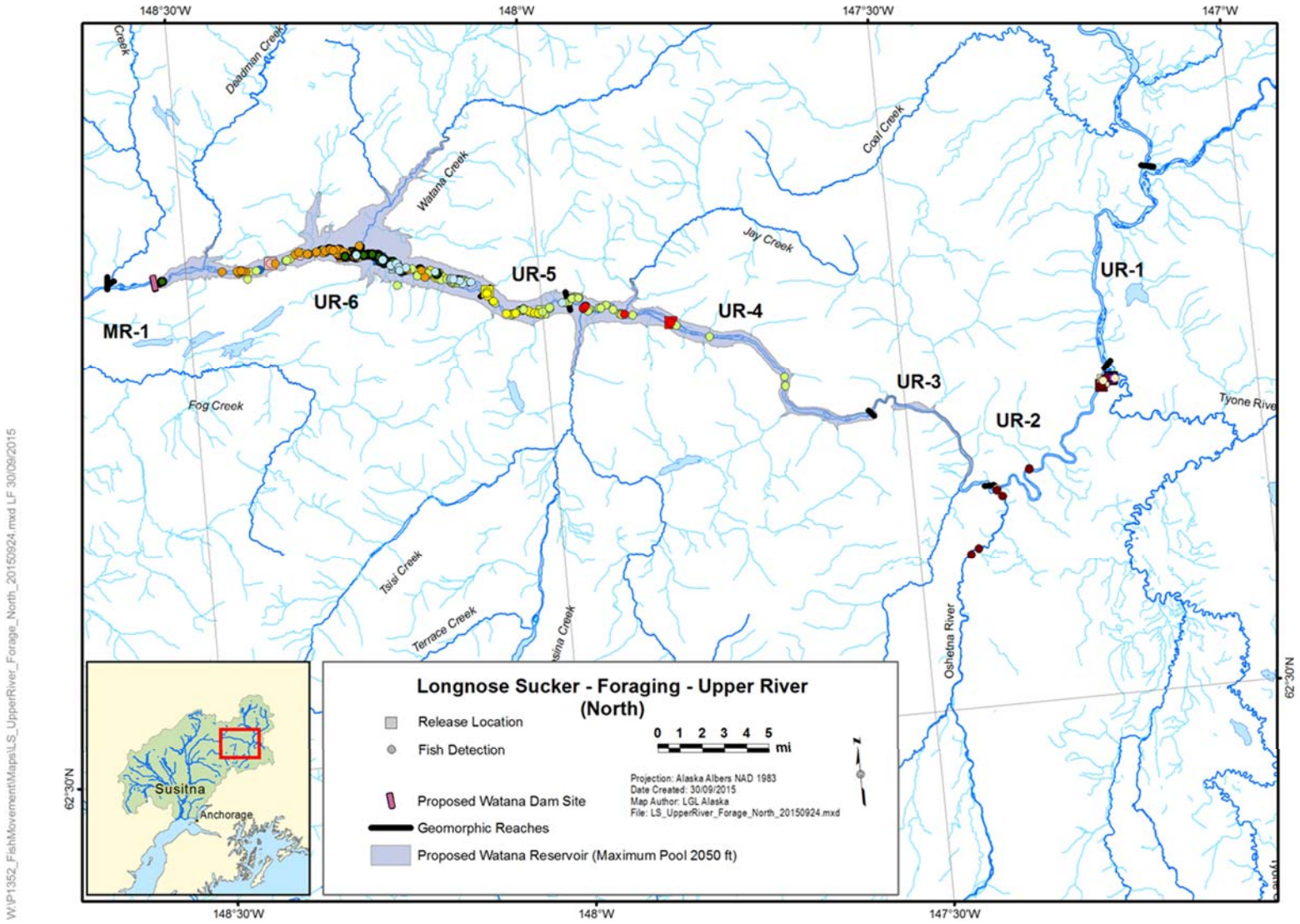

Figure 5.6-1. Locations of Longnose Sucker tagged in the Upper Susitna River, during the foraging period. The color of each detection dot matches the color of the location where the fish was released.

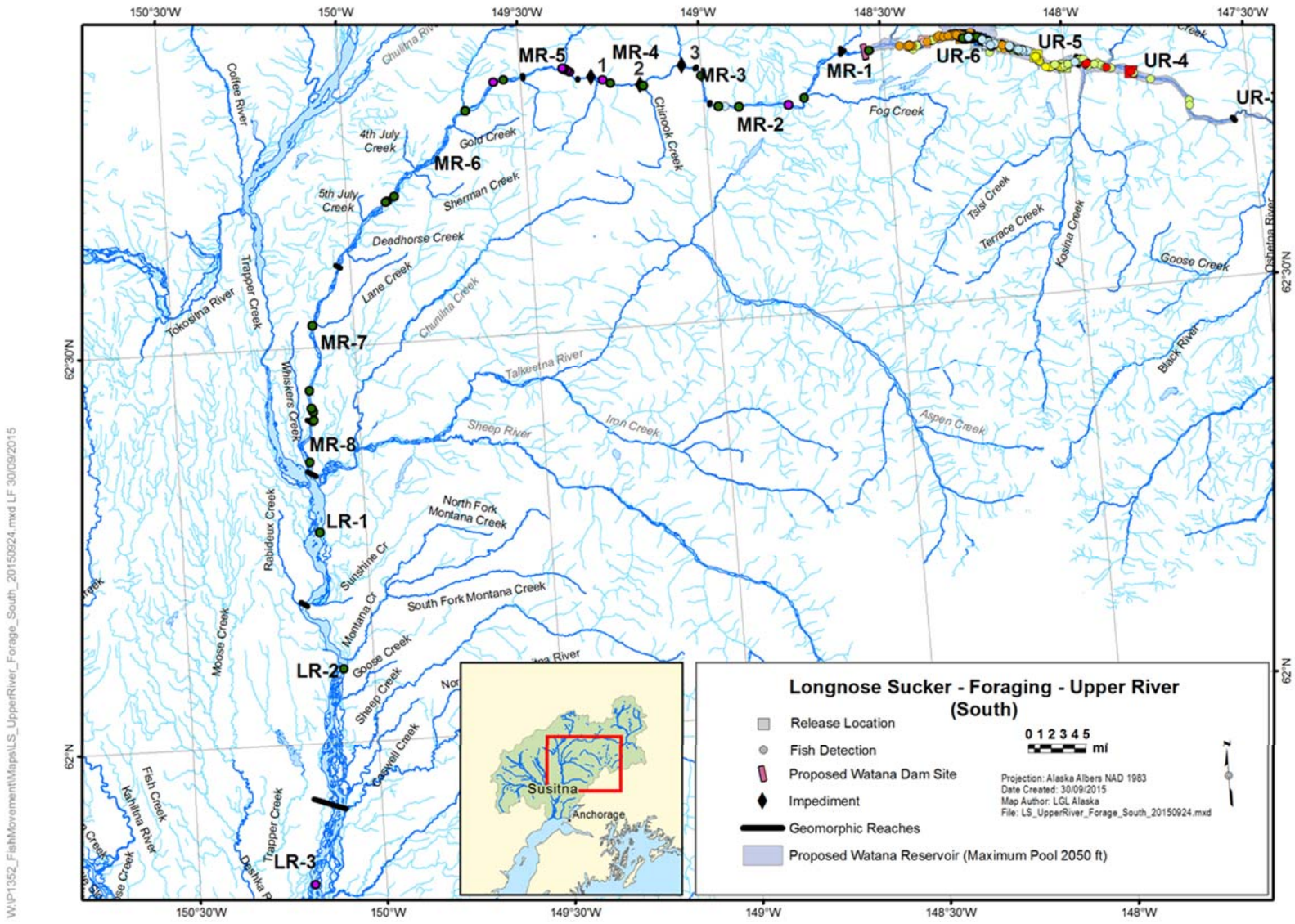

Figure 5.6-2. Locations of Longnose Sucker tagged in the Upper Susitna River, during the foraging period. The color of each detection dot matches the color of the location where the fish was released.

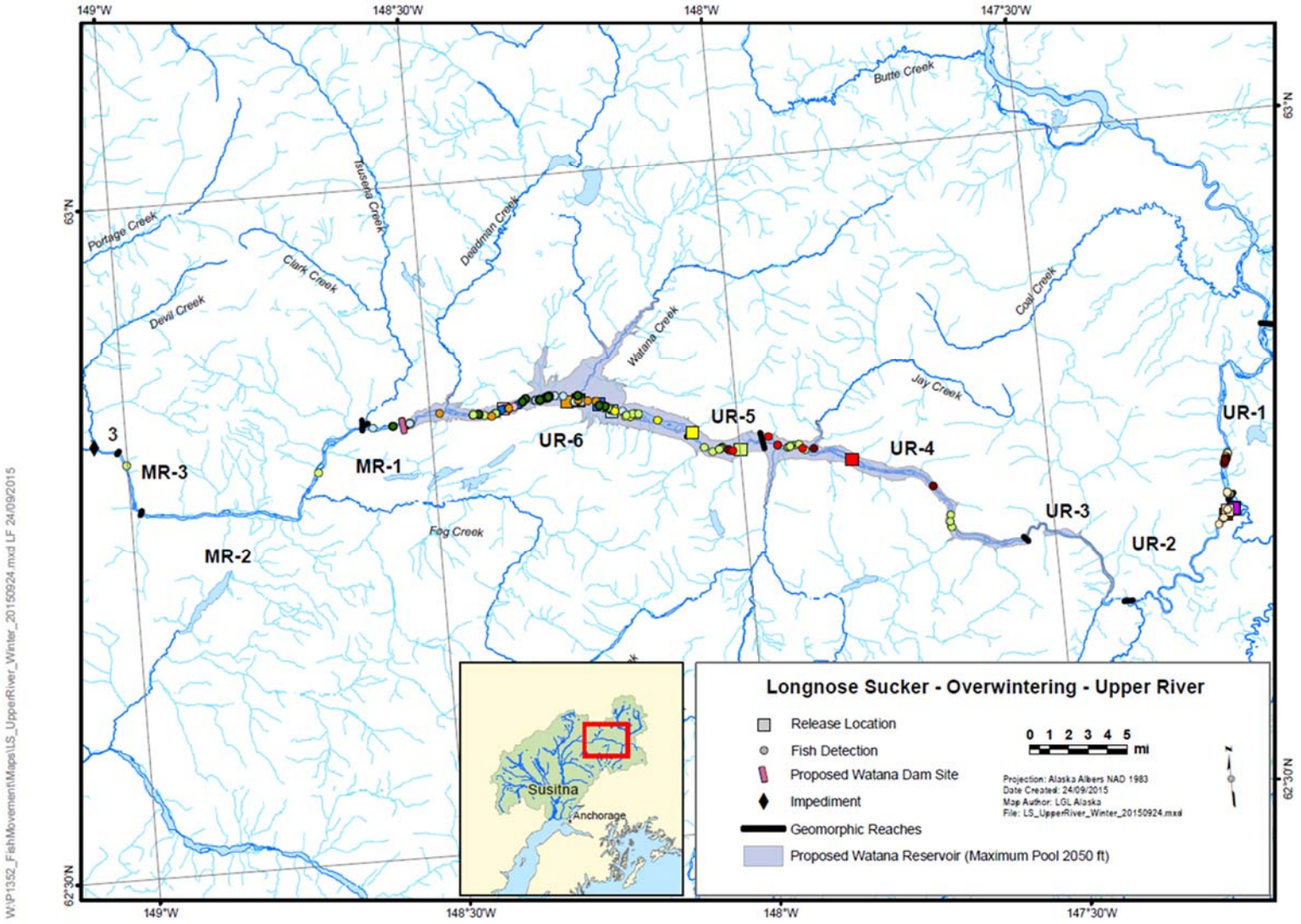

Figure 5.6-3. Locations of Longnose Sucker tagged in the Upper Susitna River, during the overwintering period. The color of each detection dot matches the color of the location where the fish was released.

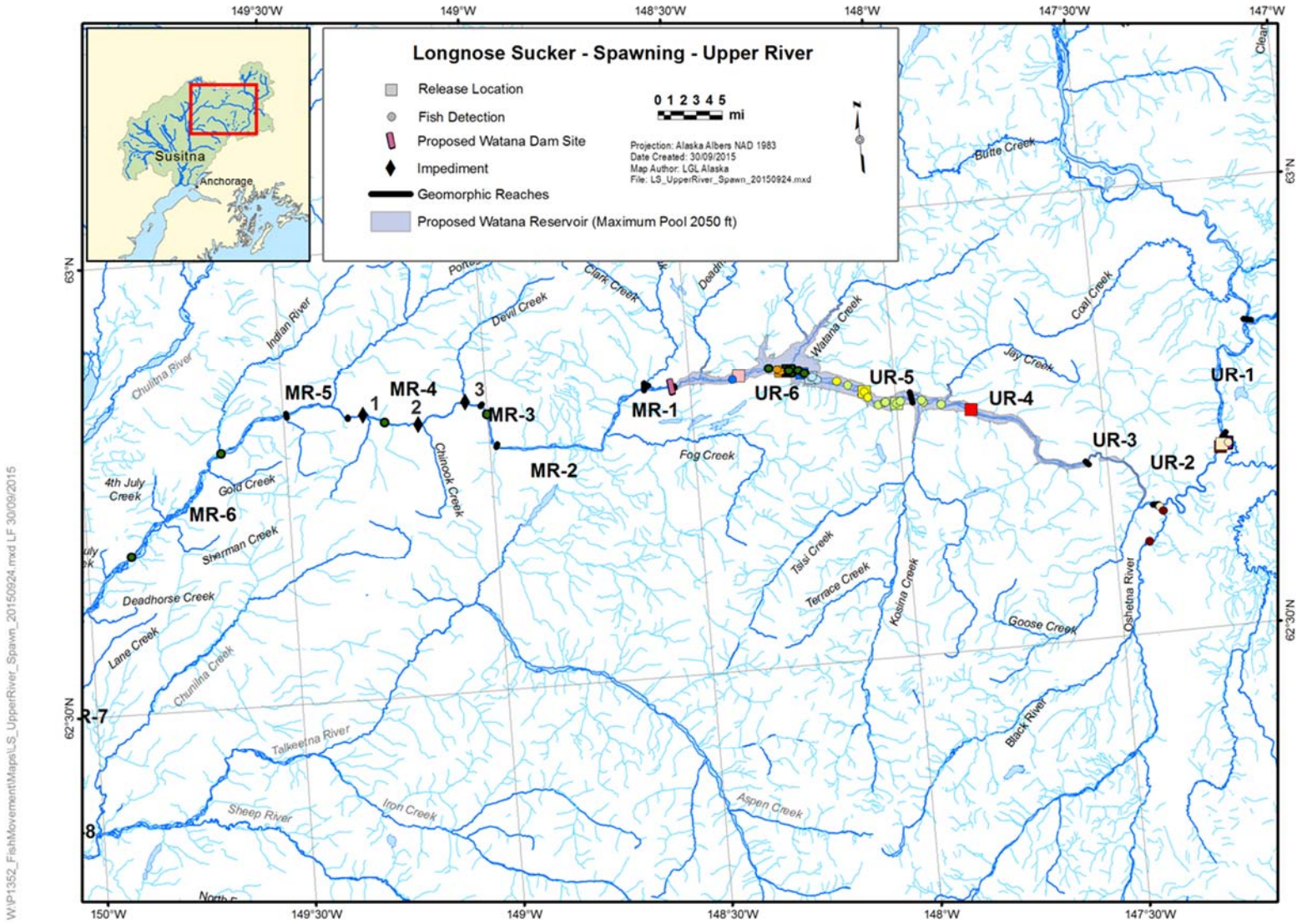

Figure 5.6-4. Locations of Longnose Sucker tagged in the Upper Susitna River, during the spawning period. The color of each detection dot matches the color of the location where the fish was released.

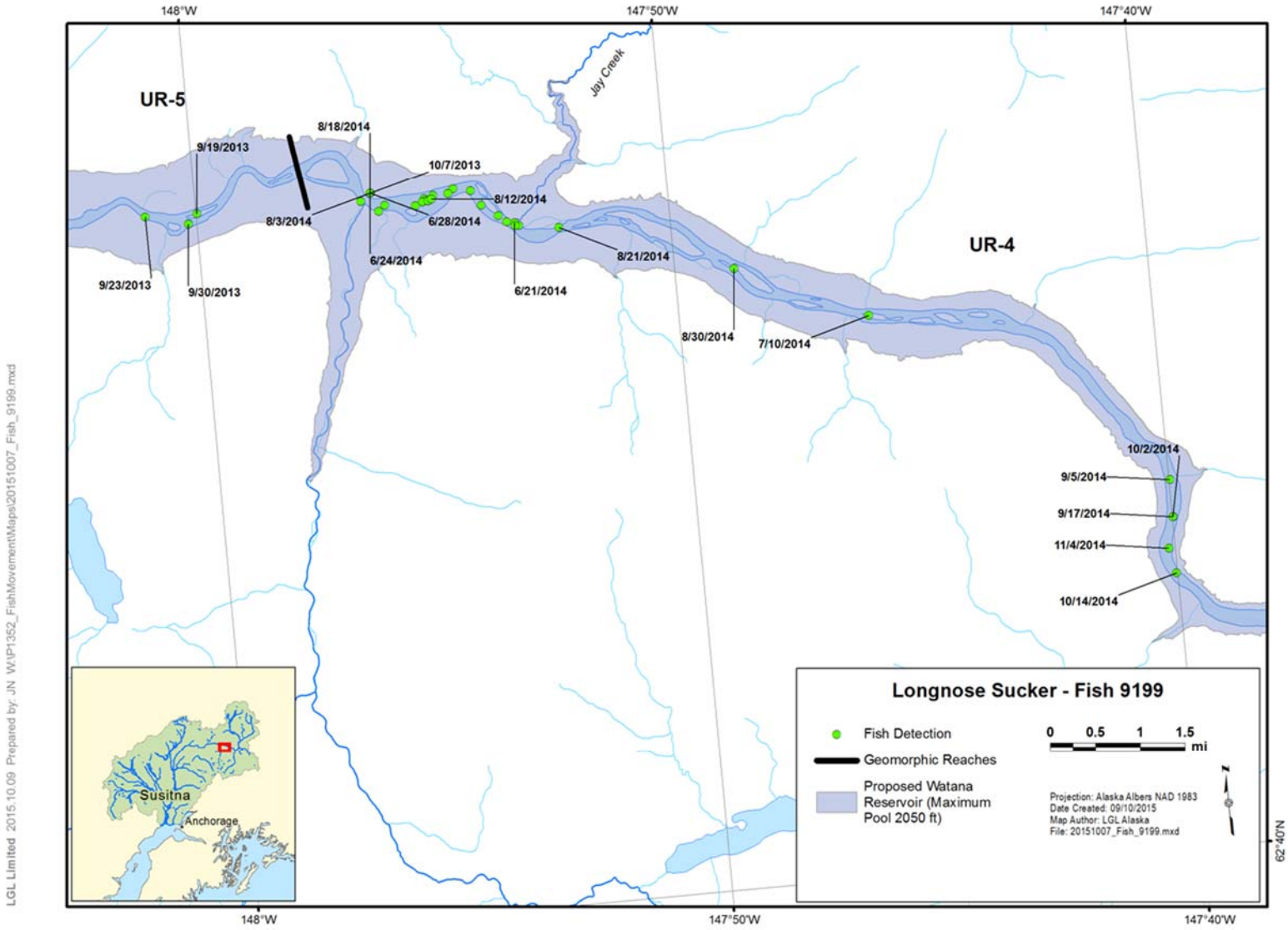

Figure 5.6-5. Tracking history for Fish 9199, a Longnose Sucker tagged in the Upper River.

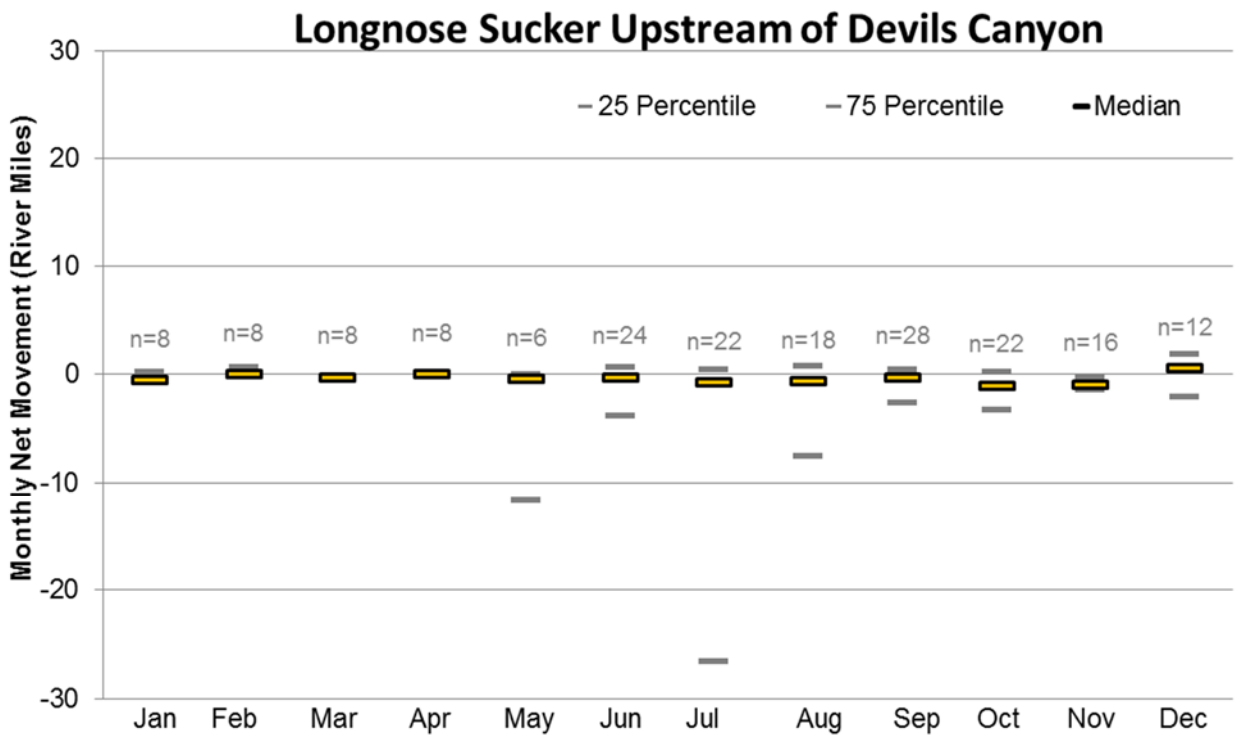

Figure 5.6-6. Net upstream and downstream movements for the tagged population of Longnose Sucker upstream of Devils Canyon by study month (n, number of fish detected each month).

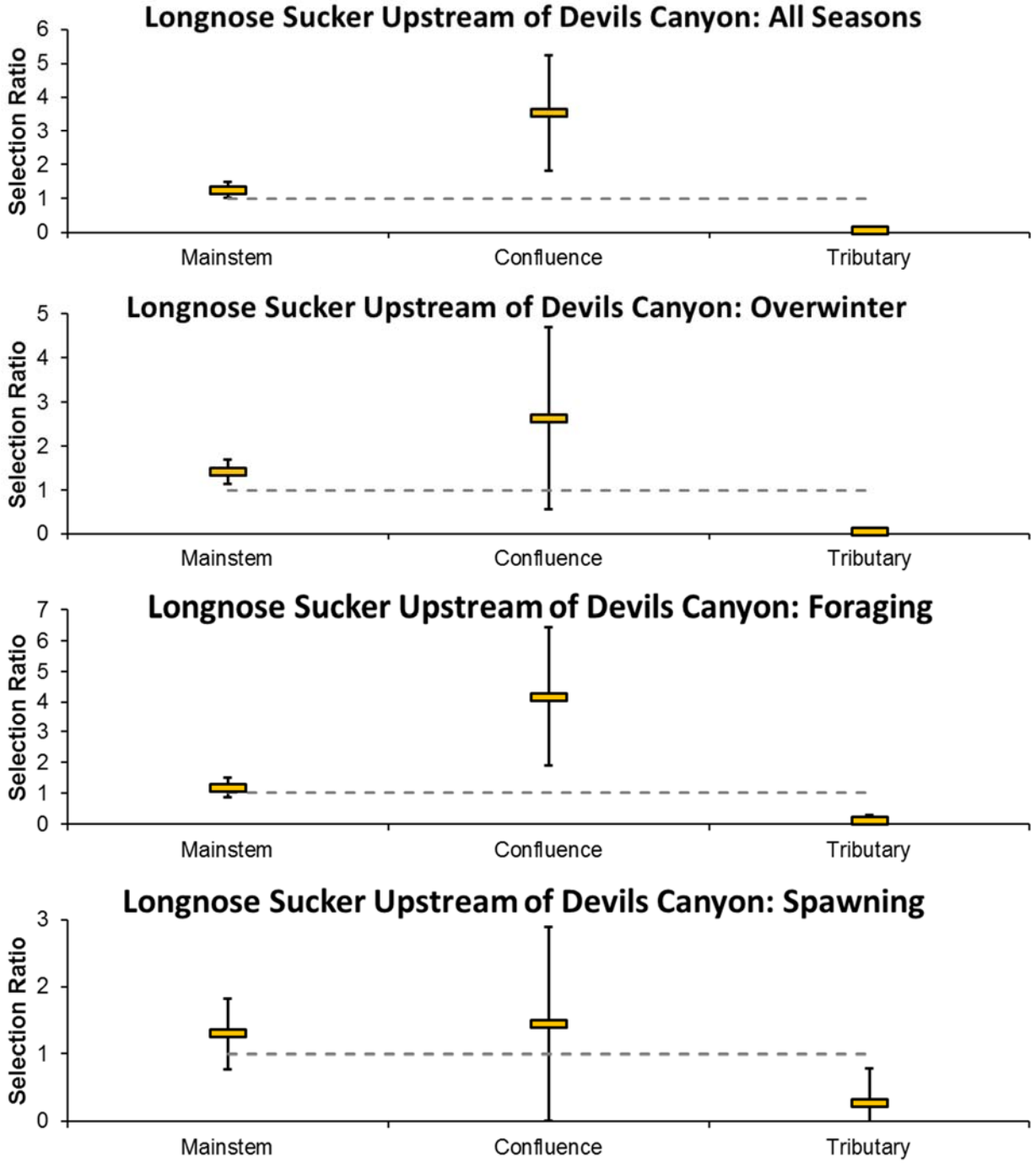

Figure 5.6-7. Habitat selection ratio with 95% Bonferroni confidence intervals for Longnose Sucker tagged upstream of Devils Canyon.

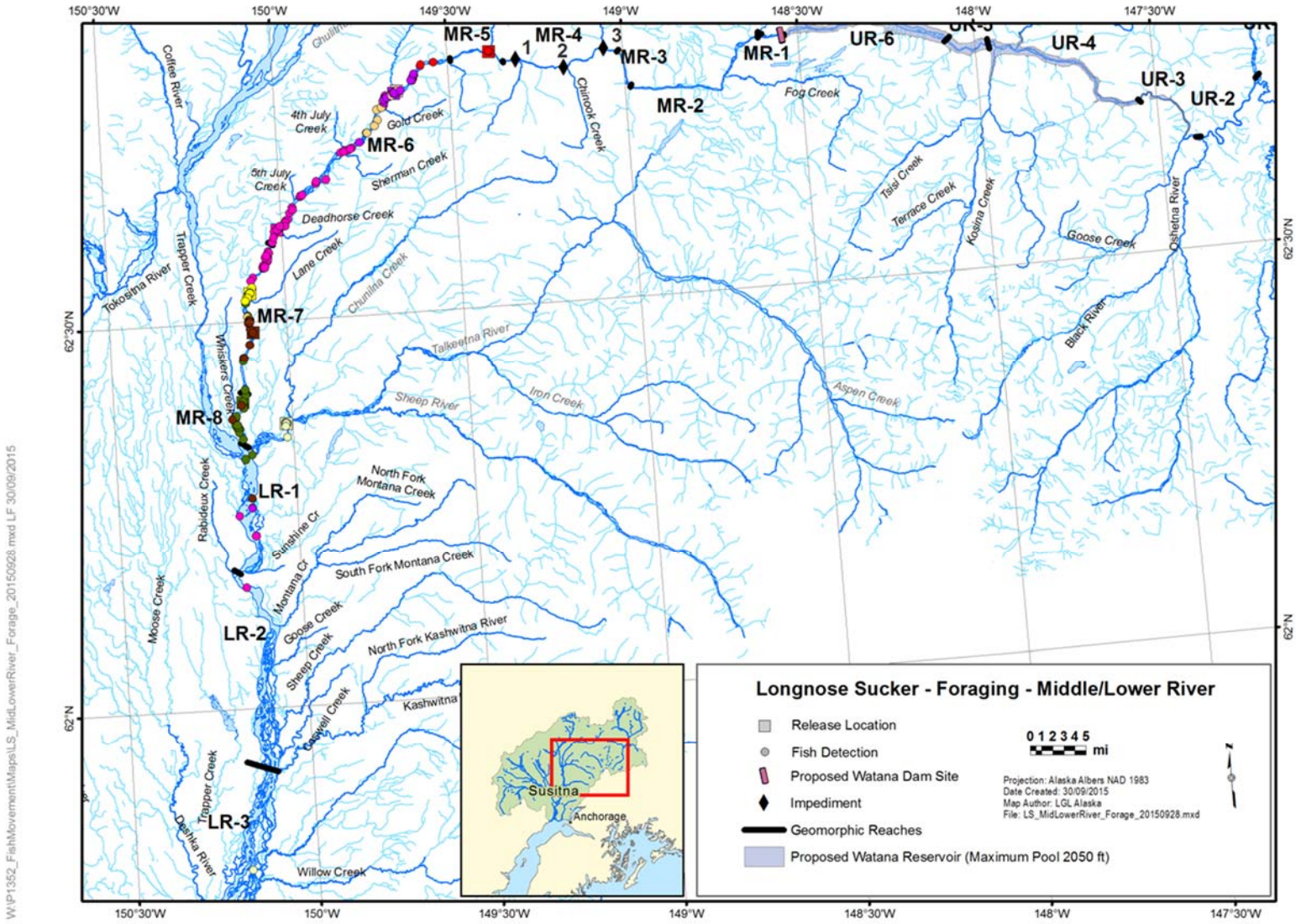

Figure 5.6-8. Locations of Longnose Sucker tagged in the Middle and Lower Susitna River, during the foraging period. The color of each detection dot matches the color of the location where the fish was released.

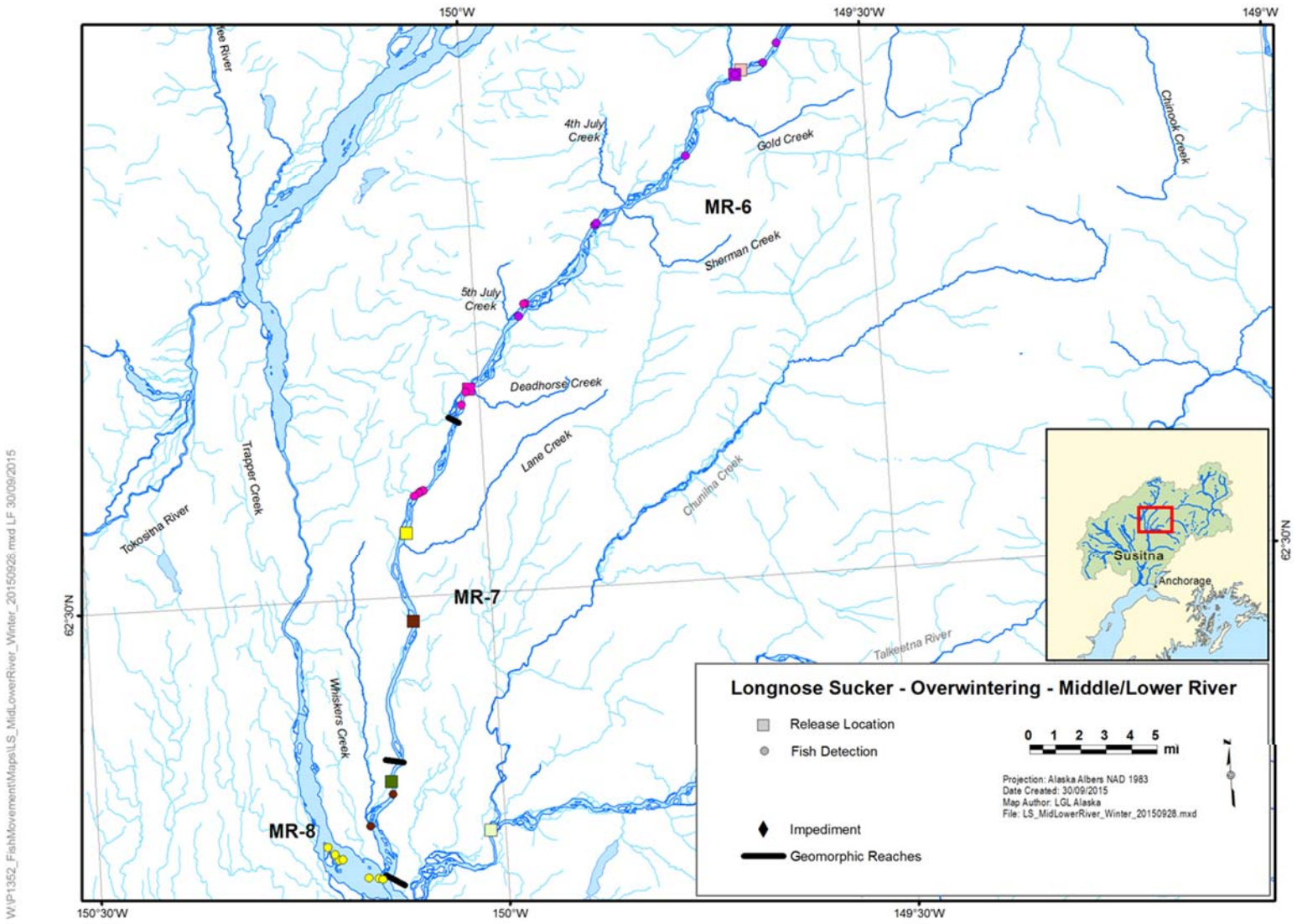

Figure 5.6-9. Locations of Longnose Sucker tagged in the Middle and Lower Susitna River, during the overwintering period. The color of each detection dot matches the color of the location where the fish was released.

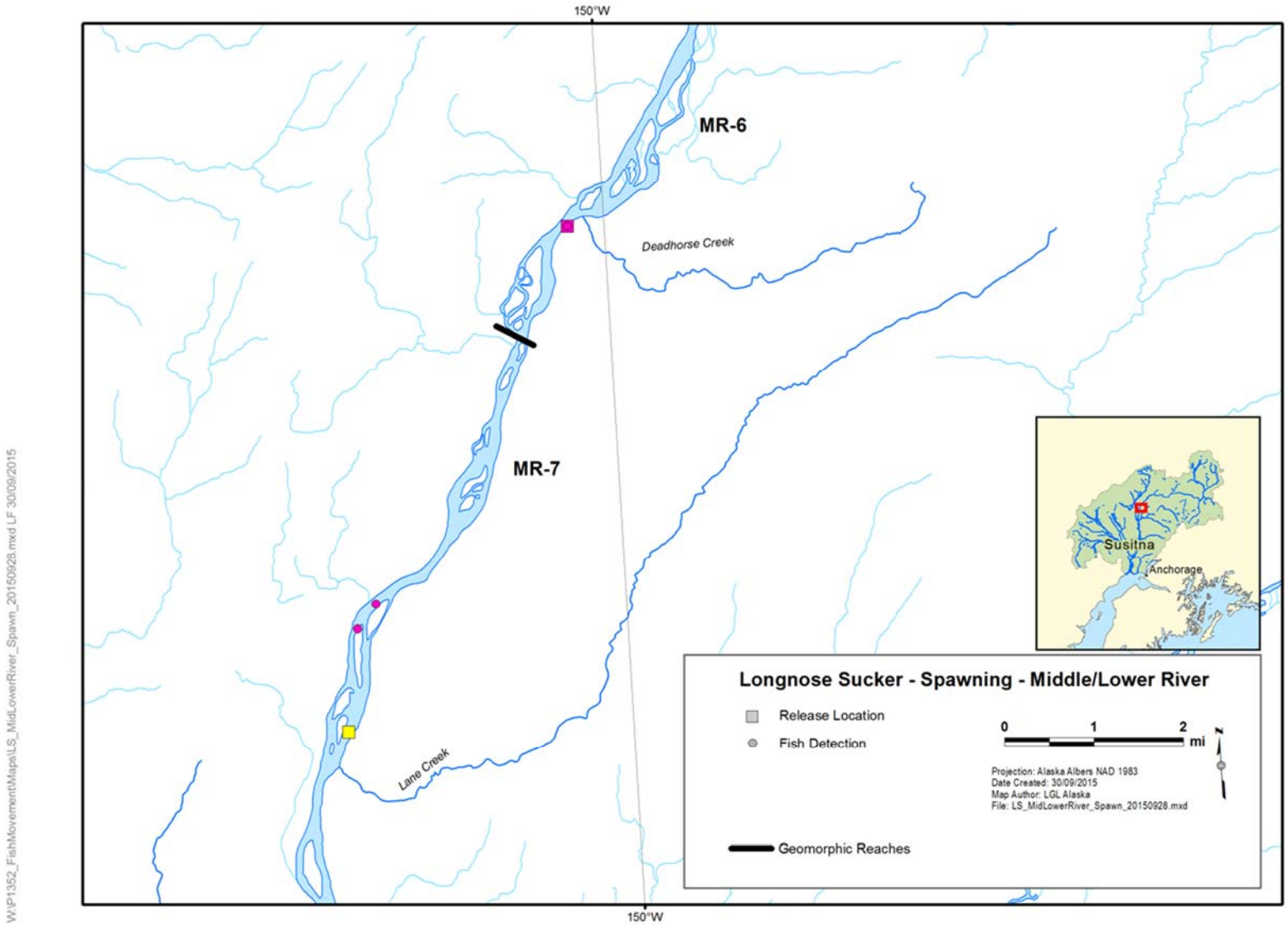

Figure 5.6-10. Locations of Longnose Sucker tagged in the Middle and Lower Susitna River, during the spawning period. The color of each detection dot matches the color of the location where the fish was released.

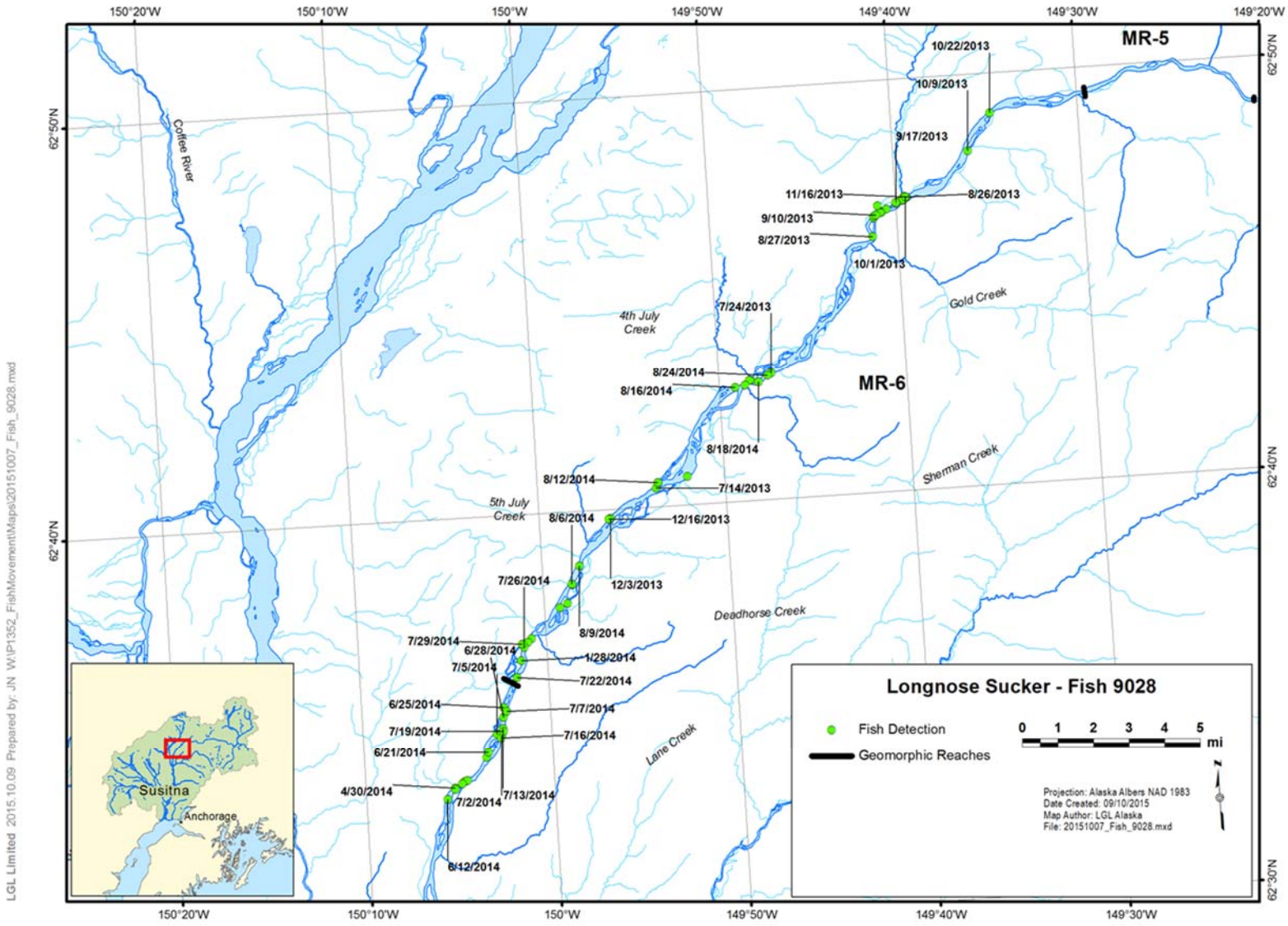

Figure 5.6-11. Tracking history for Fish 9028, a Longnose Sucker tagged in the Middle River.

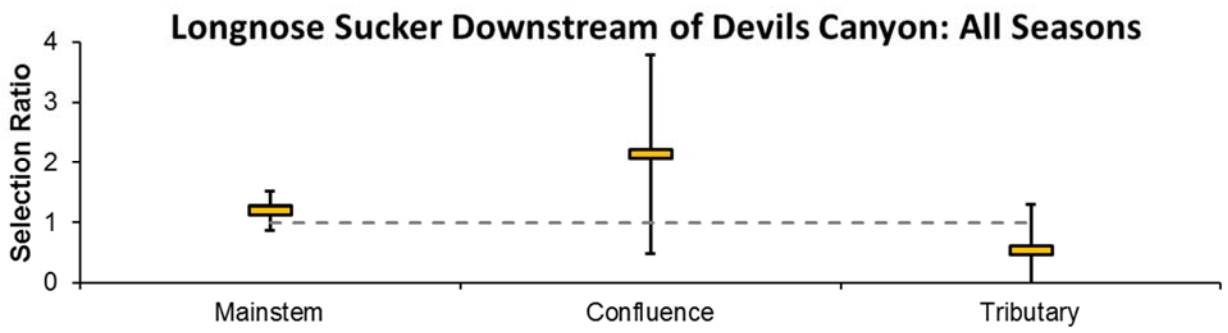

Figure 5.6-12. Habitat selection ratio with 95% Bonferroni confidence intervals for Longnose Sucker tagged downstream of Devils Canyon.

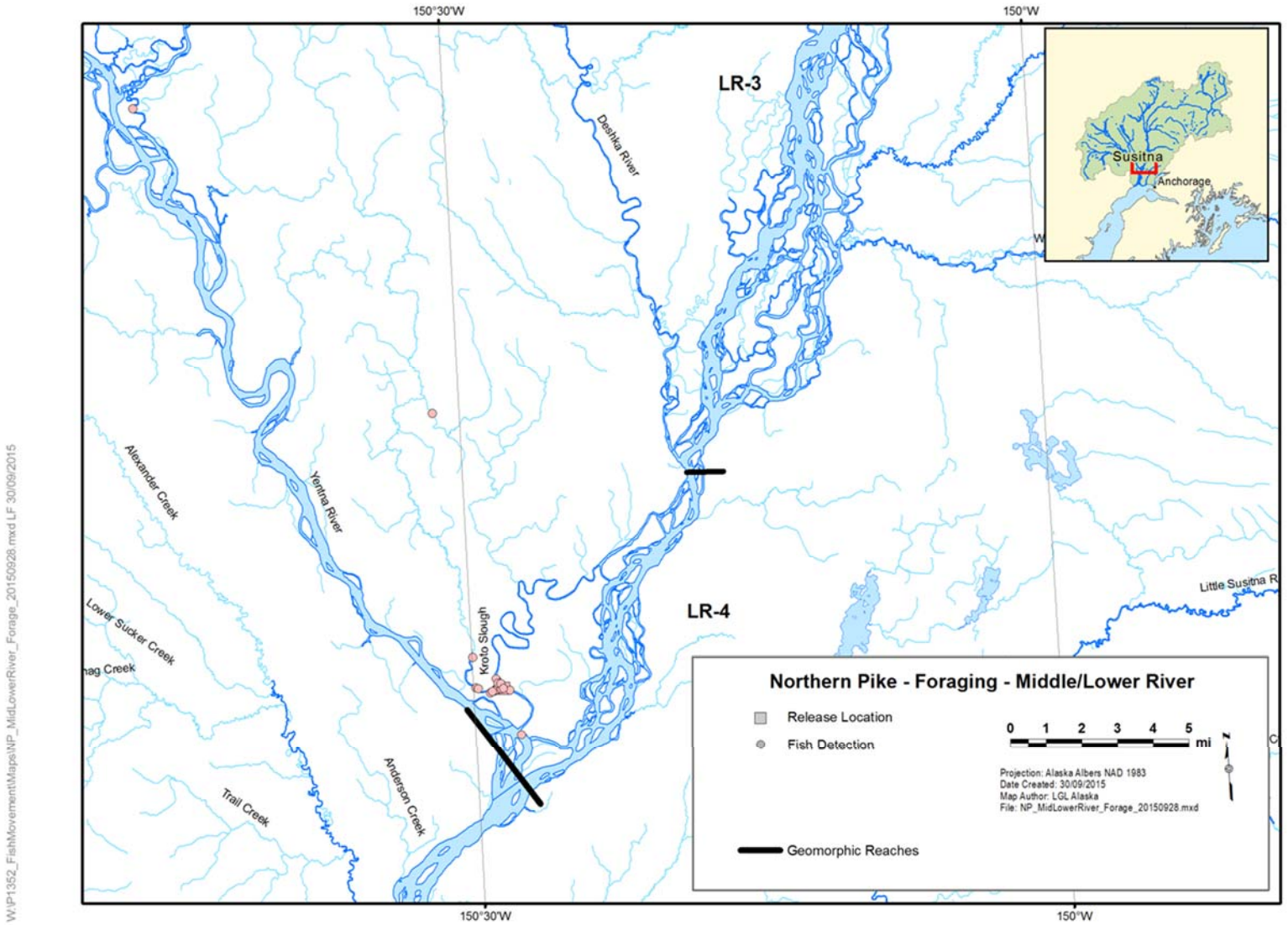

Figure 5.7-1. Locations of Northern Pike tagged in the Middle and Lower Susitna River, during the foraging period. The color of each detection dot matches the color of the location where the fish was released. The upstream-most location was reported by the sports fishery.

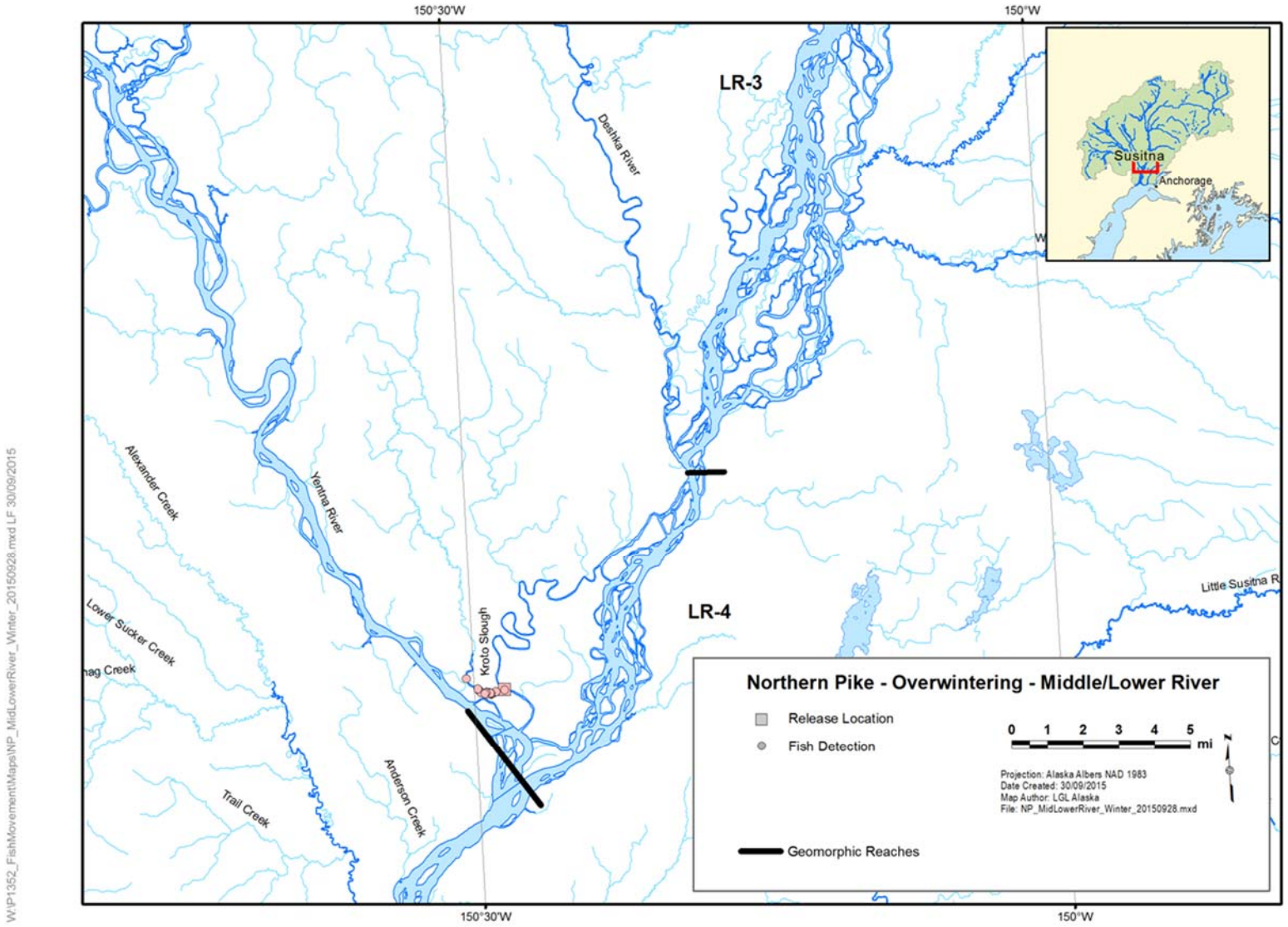

Figure 5.7-2. Locations of Northern Pike tagged in the Middle and Lower Susitna River, during the overwintering period. The color of each detection dot matches the color of the location where the fish was released.

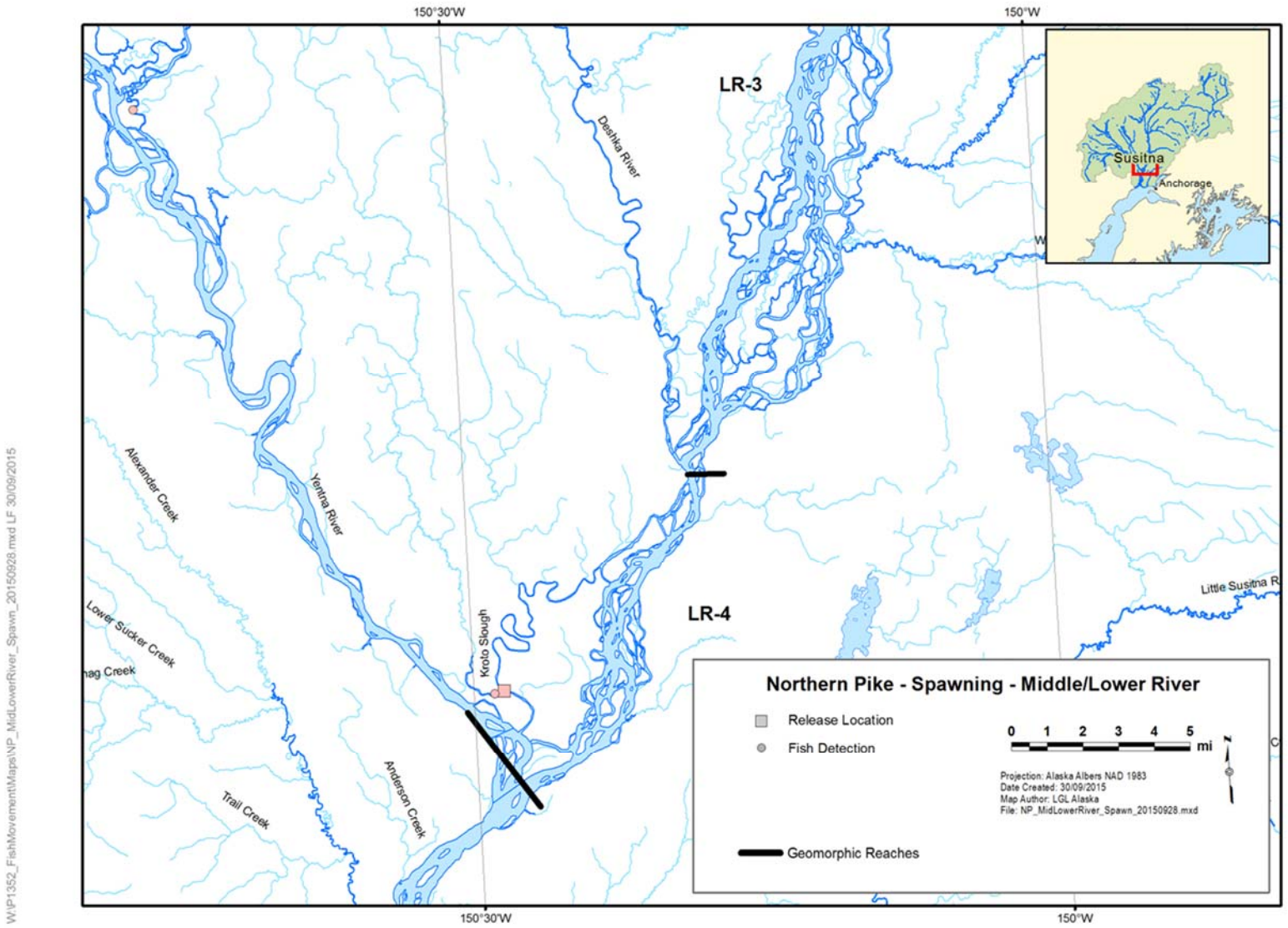

Figure 5.7-3. Locations of Northern Pike tagged in the Middle and Lower Susitna River, during the spawning period. The color of each detection dot matches the color of the location where the fish was released.

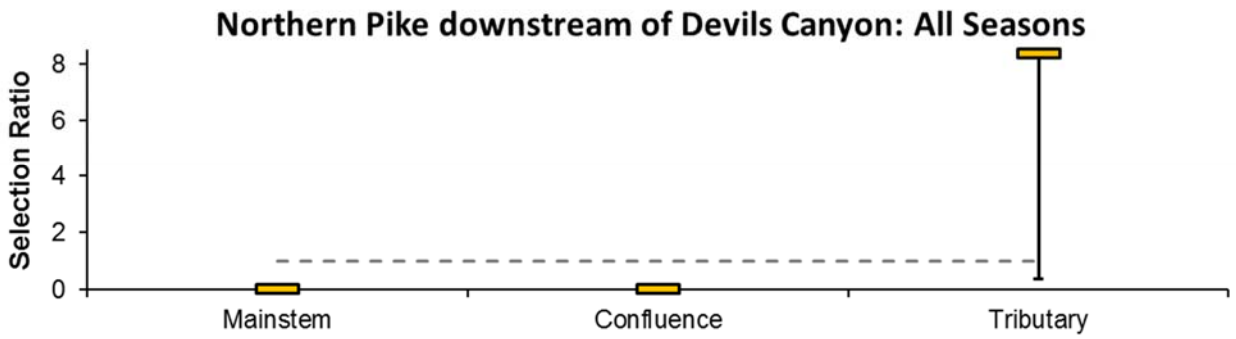

Figure 5.7-4. Habitat selection ratios with 95% Bonferroni confidence intervals for Northern Pike tagged downstream of Devils Canyon.

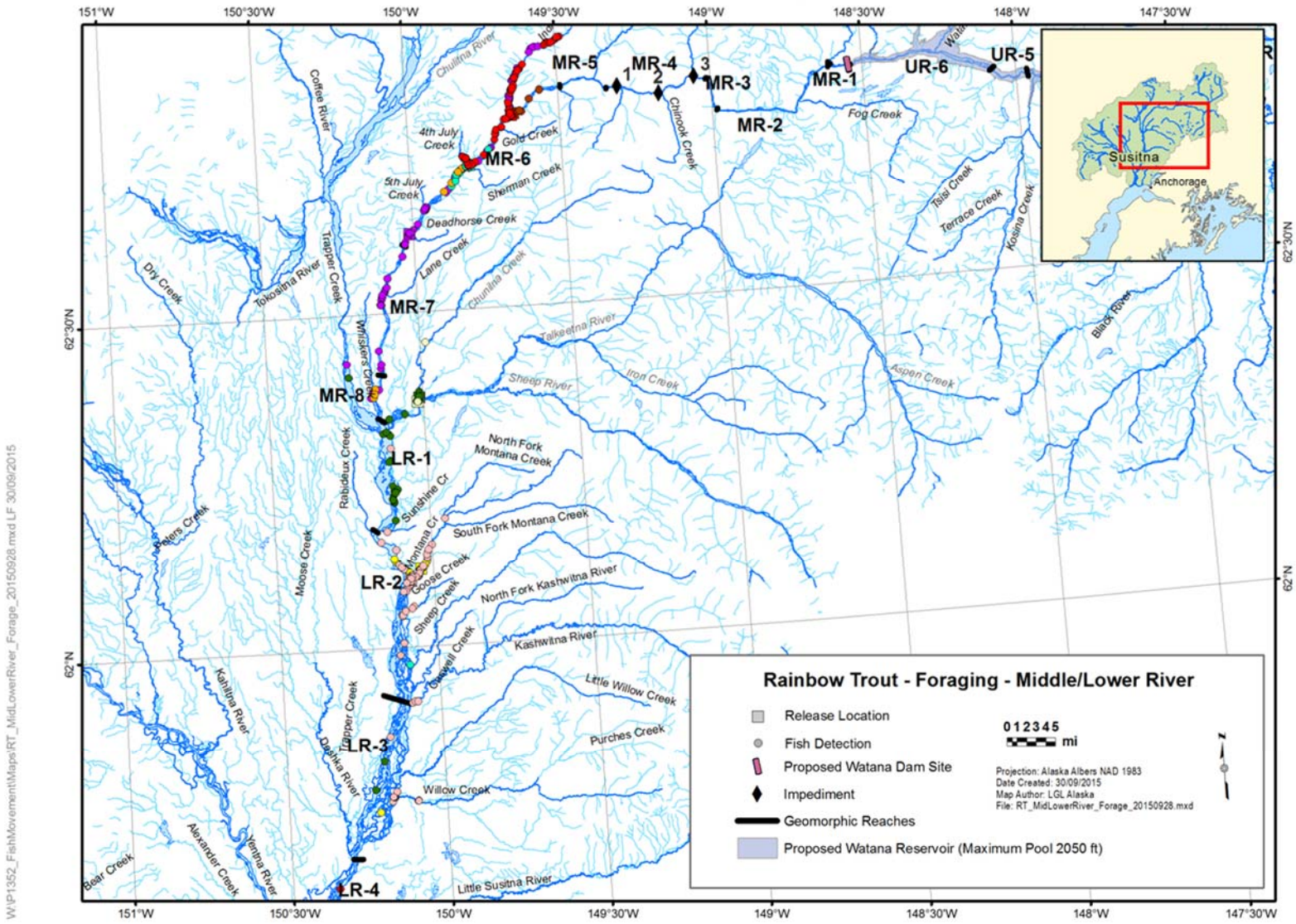

Figure 5.8-1. Locations of Rainbow Trout tagged in the Middle and Lower Susitna River, during the foraging period. The color of each detection dot matches the color of the location where the fish was released.

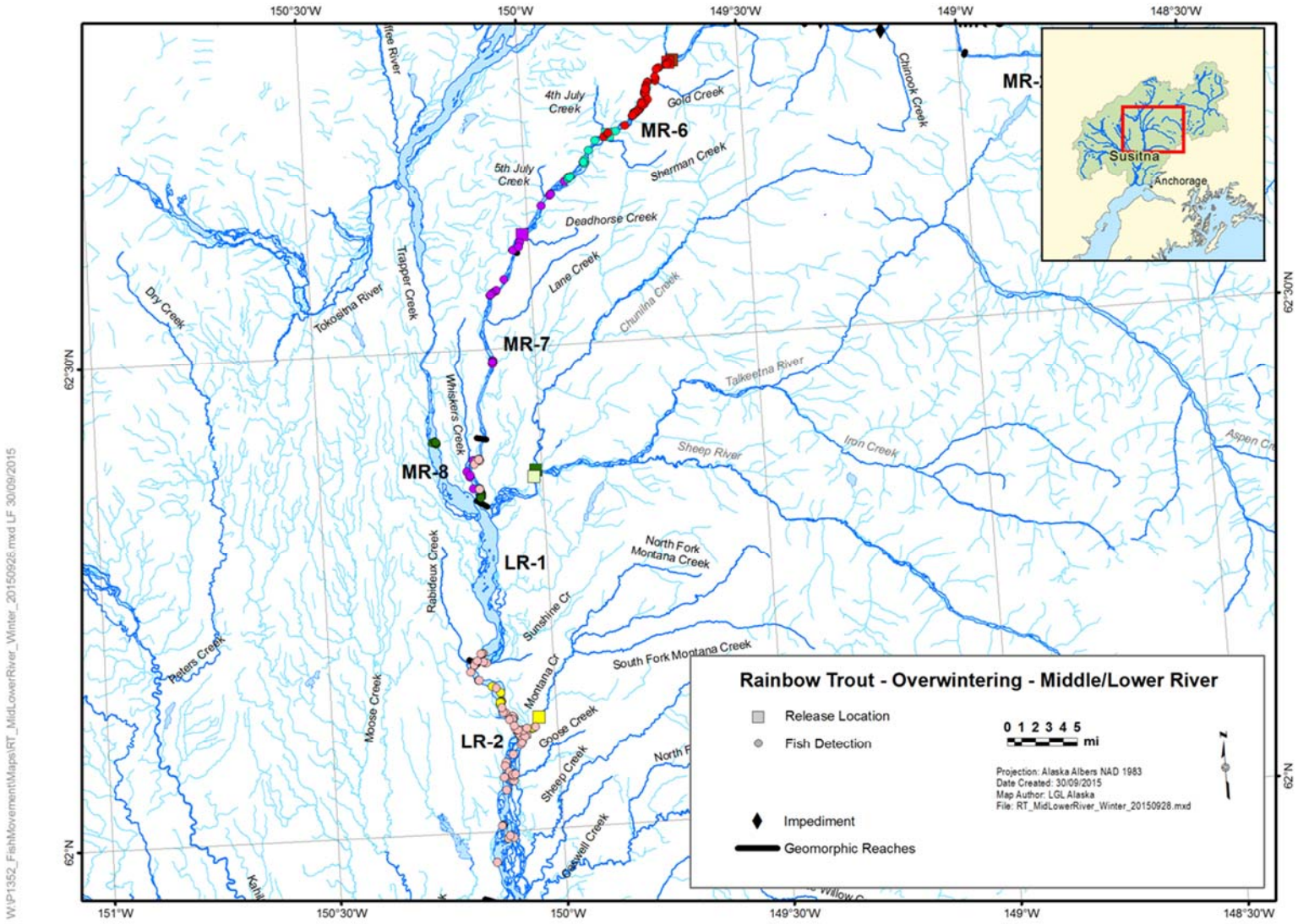

Figure 5.8-2. Locations of Rainbow Trout tagged in the Middle and Lower Susitna River, during the overwintering period. The color of each detection dot matches the color of the location where the fish was released.

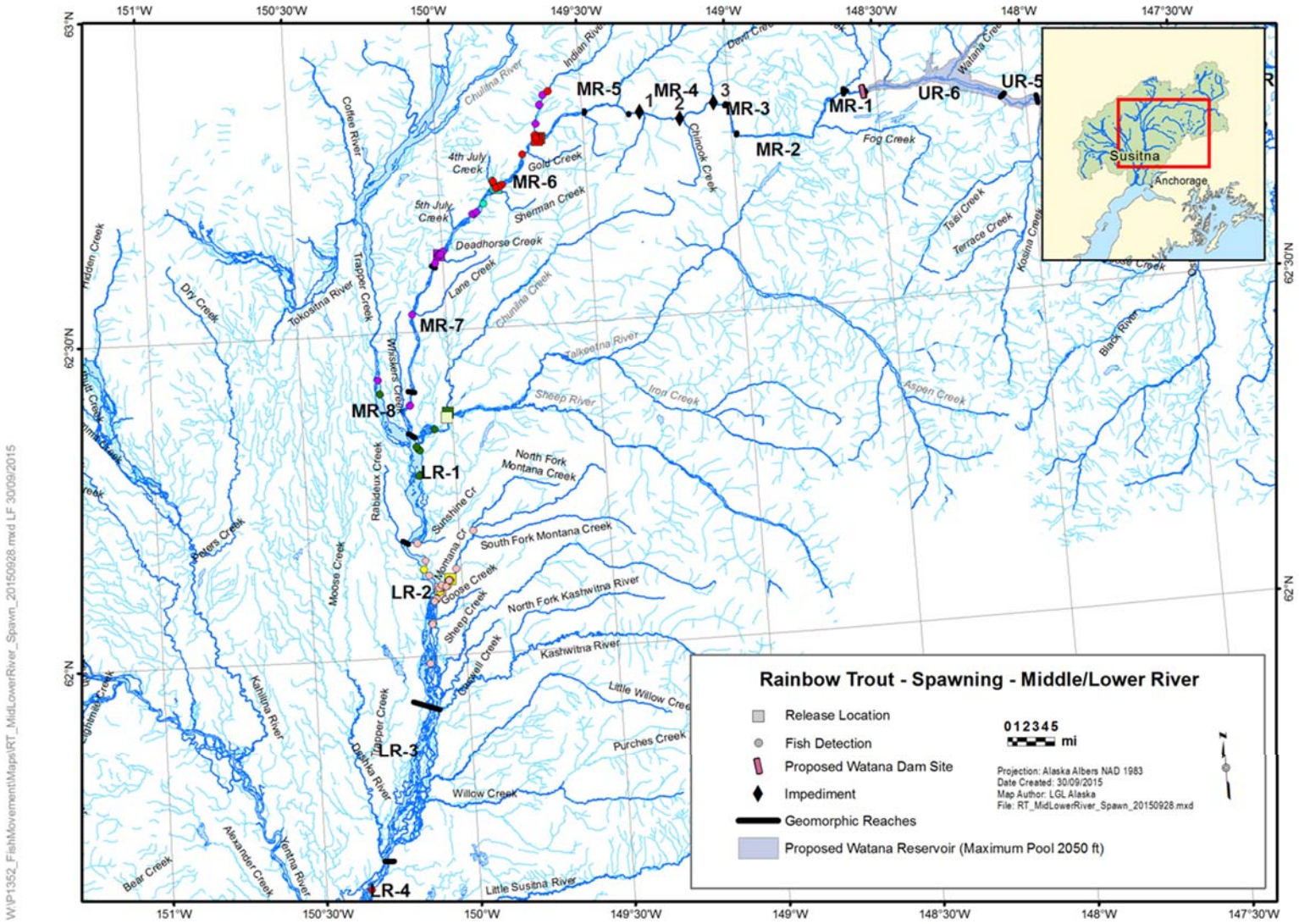

Figure 5.8-3. Locations of Rainbow Trout tagged in the Middle and Lower Susitna River, during the spawning period. The color of each detection dot matches the color of the location where the fish was released.

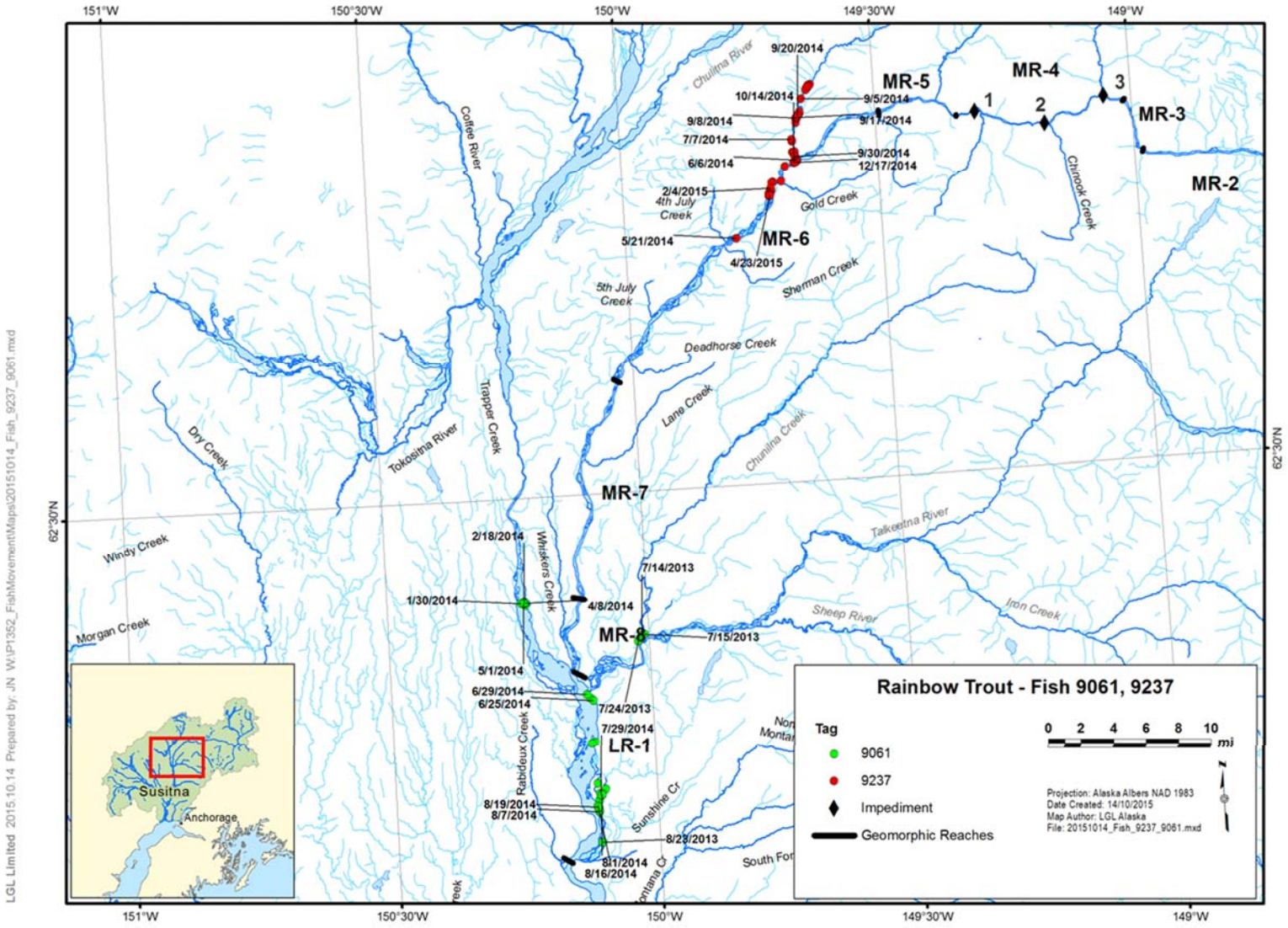

Figure 5.8-4. Tracking history for Fish 9061 and Fish 9237, Rainbow Trout tagged in the Middle and Lower River.

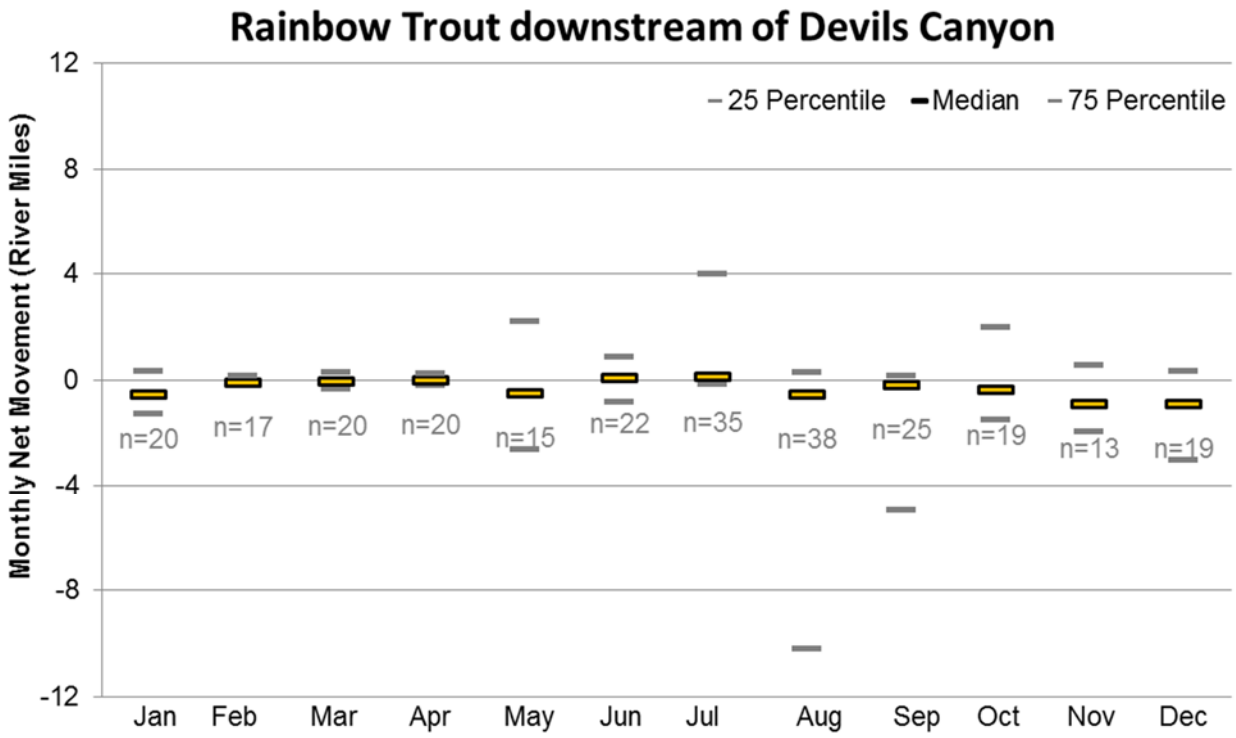

Figure 5.8-5. Net upstream and downstream movements for the tagged population of Rainbow Trout downstream of Devils Canyon by study month (n, number of fish detected each month).

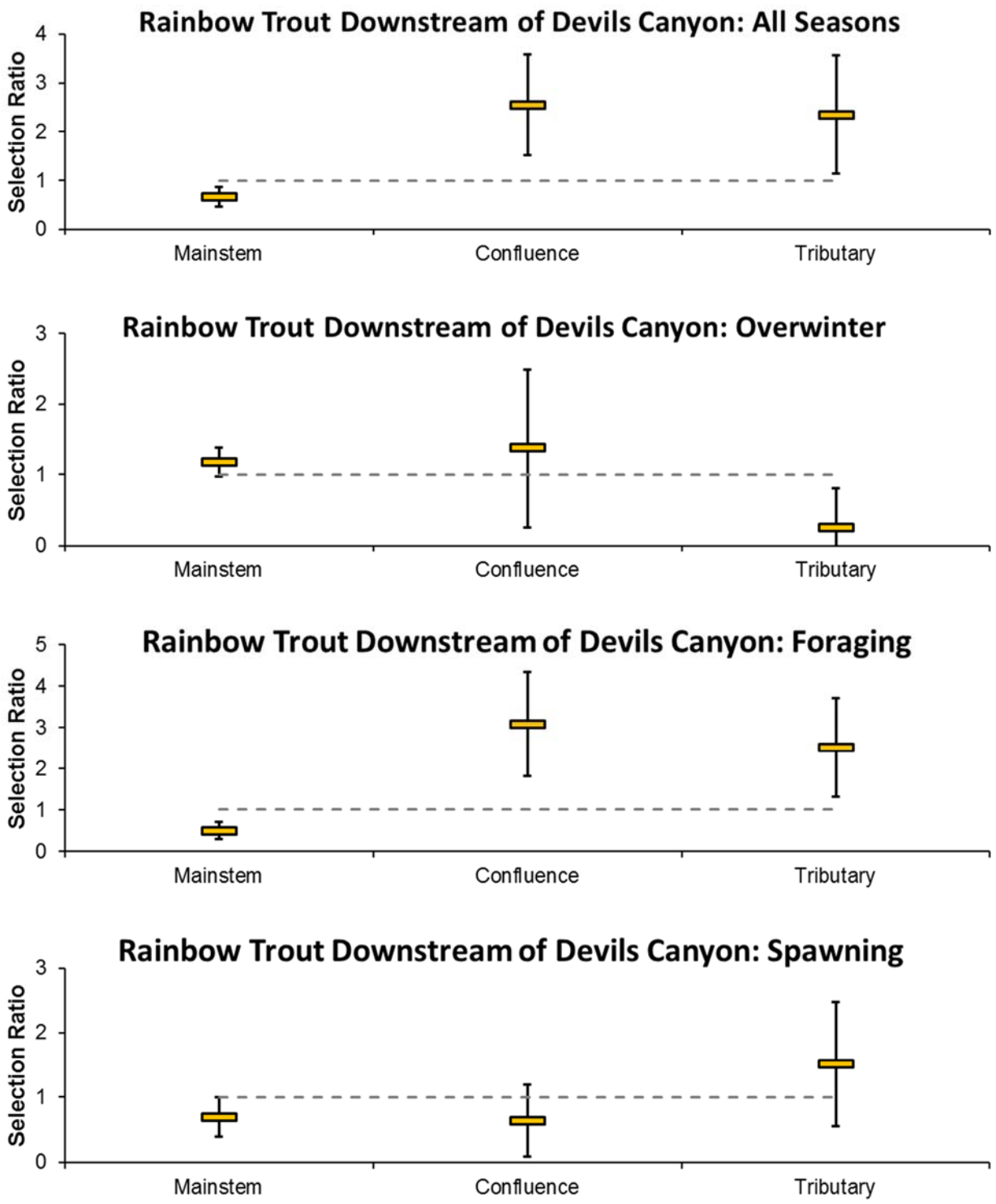

Figure 5.8-6. Habitat selection ratios with 95% Bonferroni confidence intervals for Rainbow Trout tagged downstream of Devils Canyon.

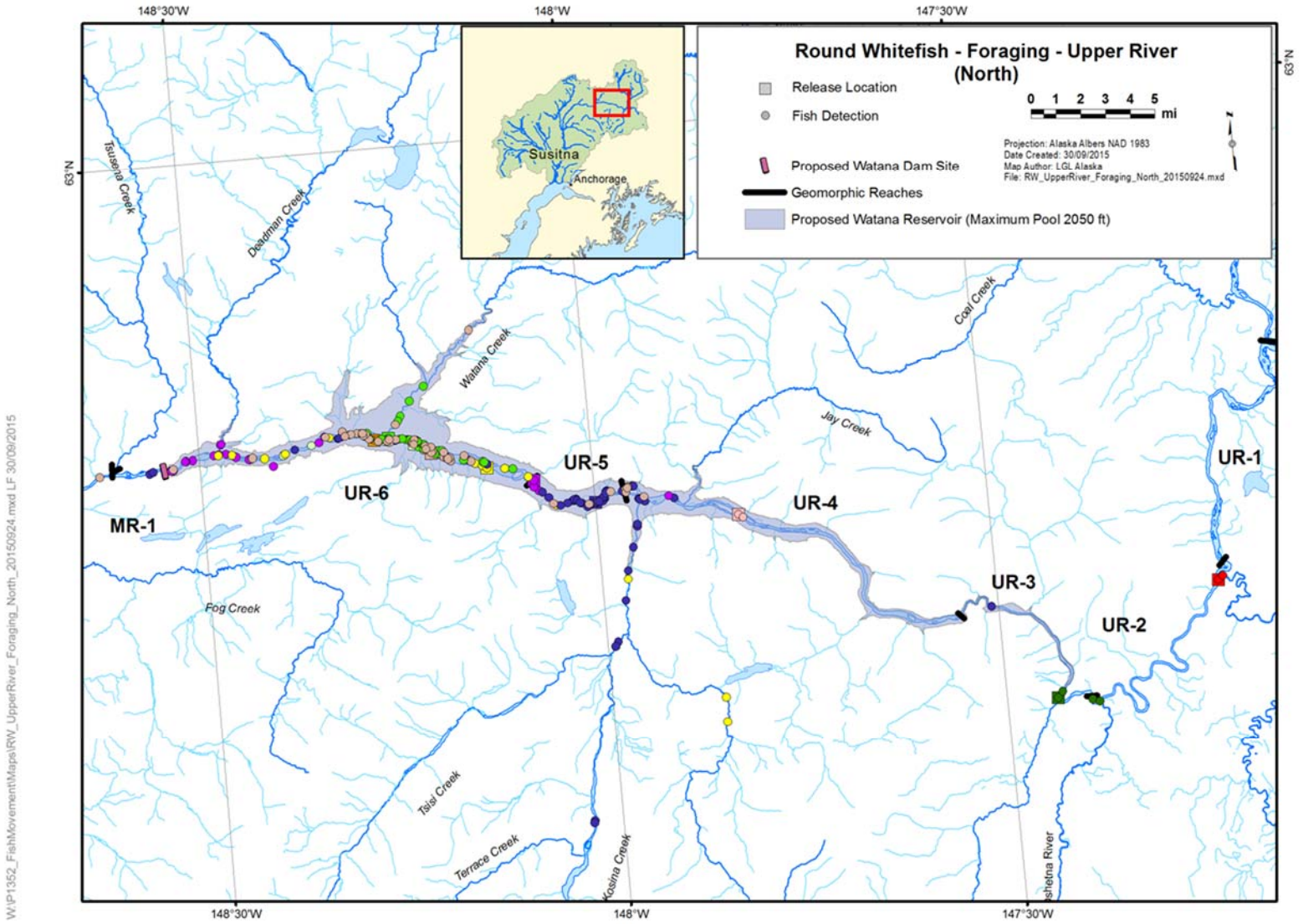

Figure 5.9-1. Locations of Round Whitefish tagged in the Upper Susitna River, during the foraging period. The color of each detection dot matches the color of the location where the fish was released.

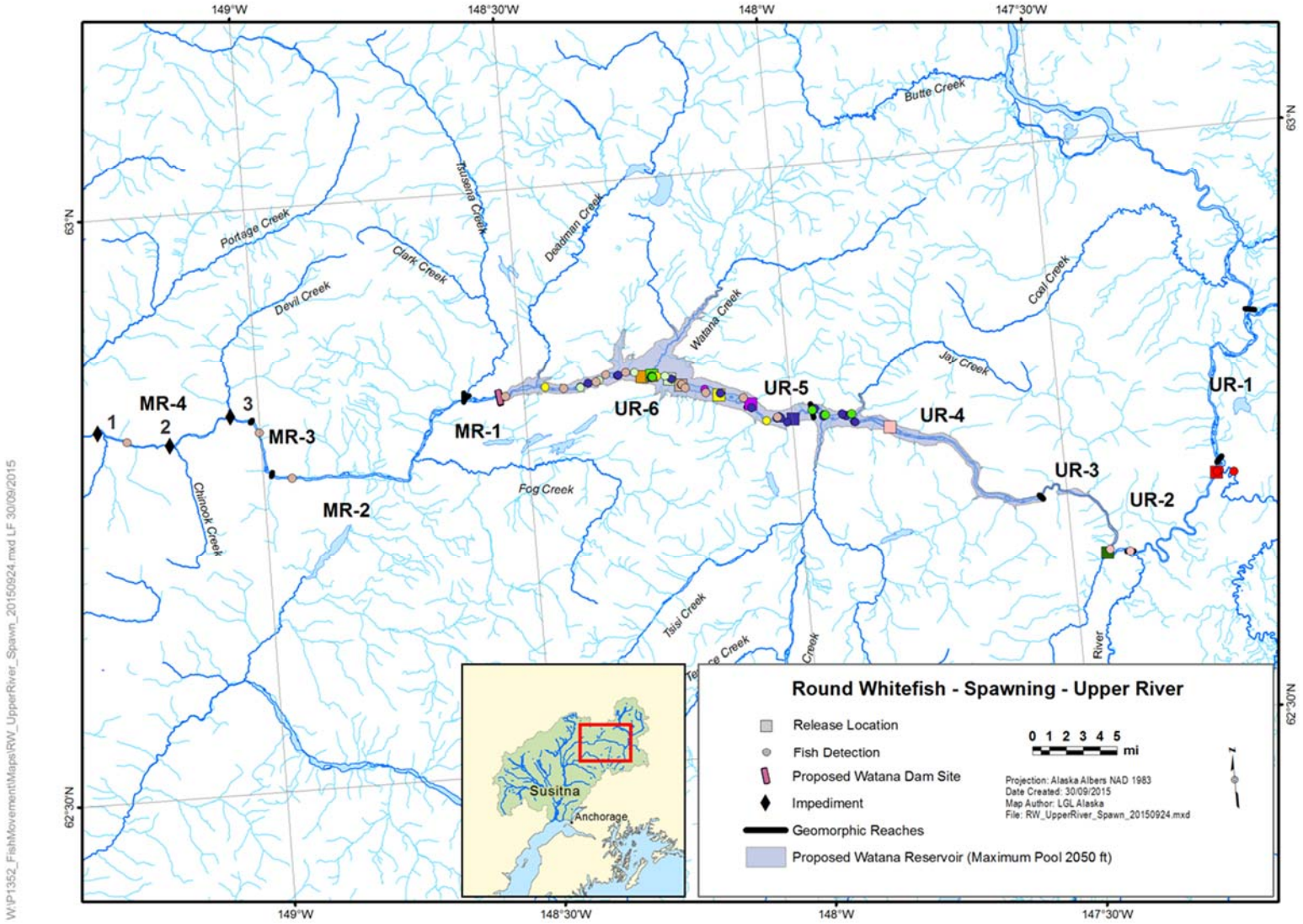

Figure 5.9-2. Locations of Round Whitefish tagged in the Upper Susitna River, during the spawning period. The color of each detection dot matches the color of the location where the fish was released.

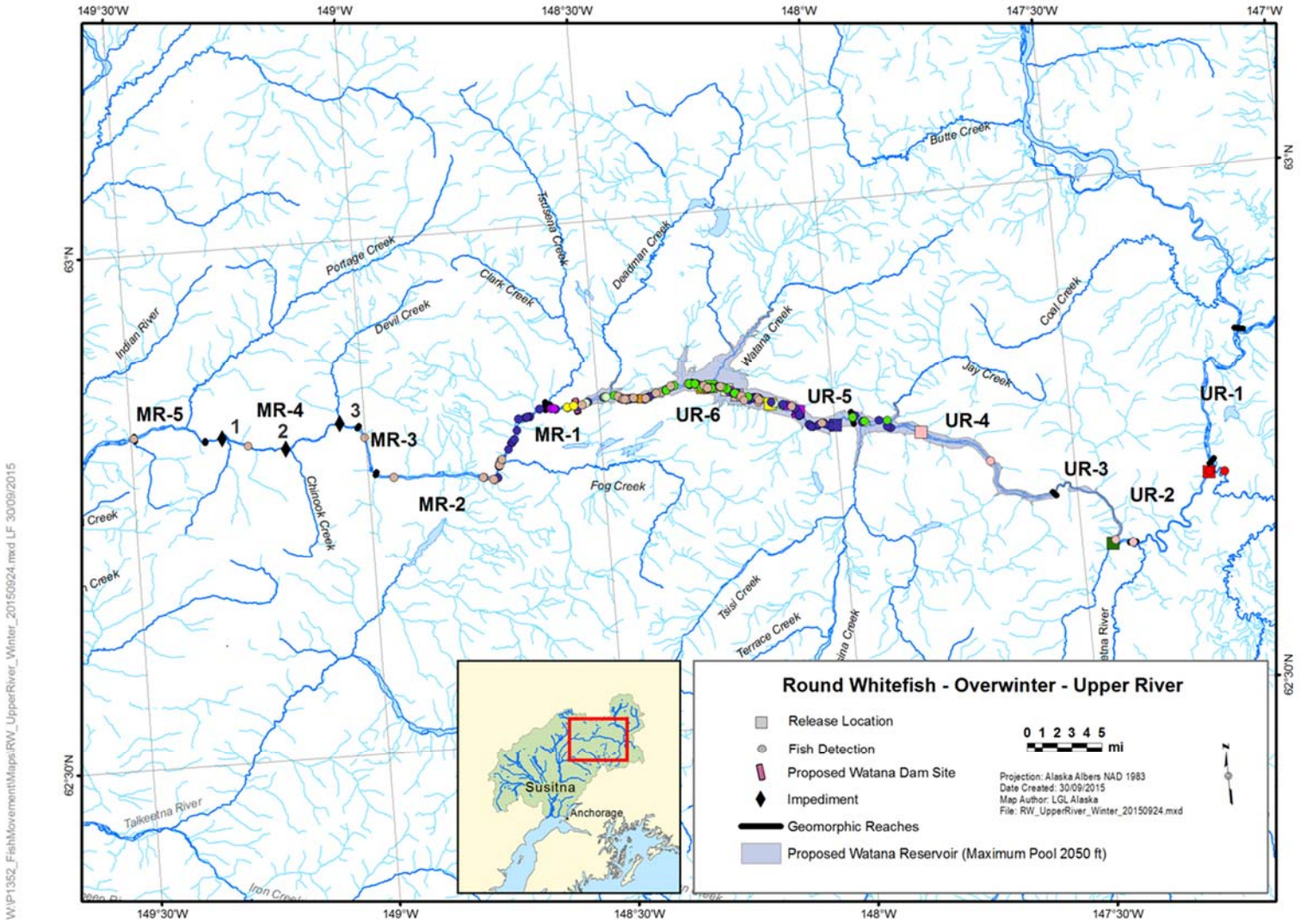

Figure 5.9-3. Locations of Round Whitefish tagged in the Upper Susitna River, during the overwintering period. The color of each detection dot matches the color of the location where the fish was released.

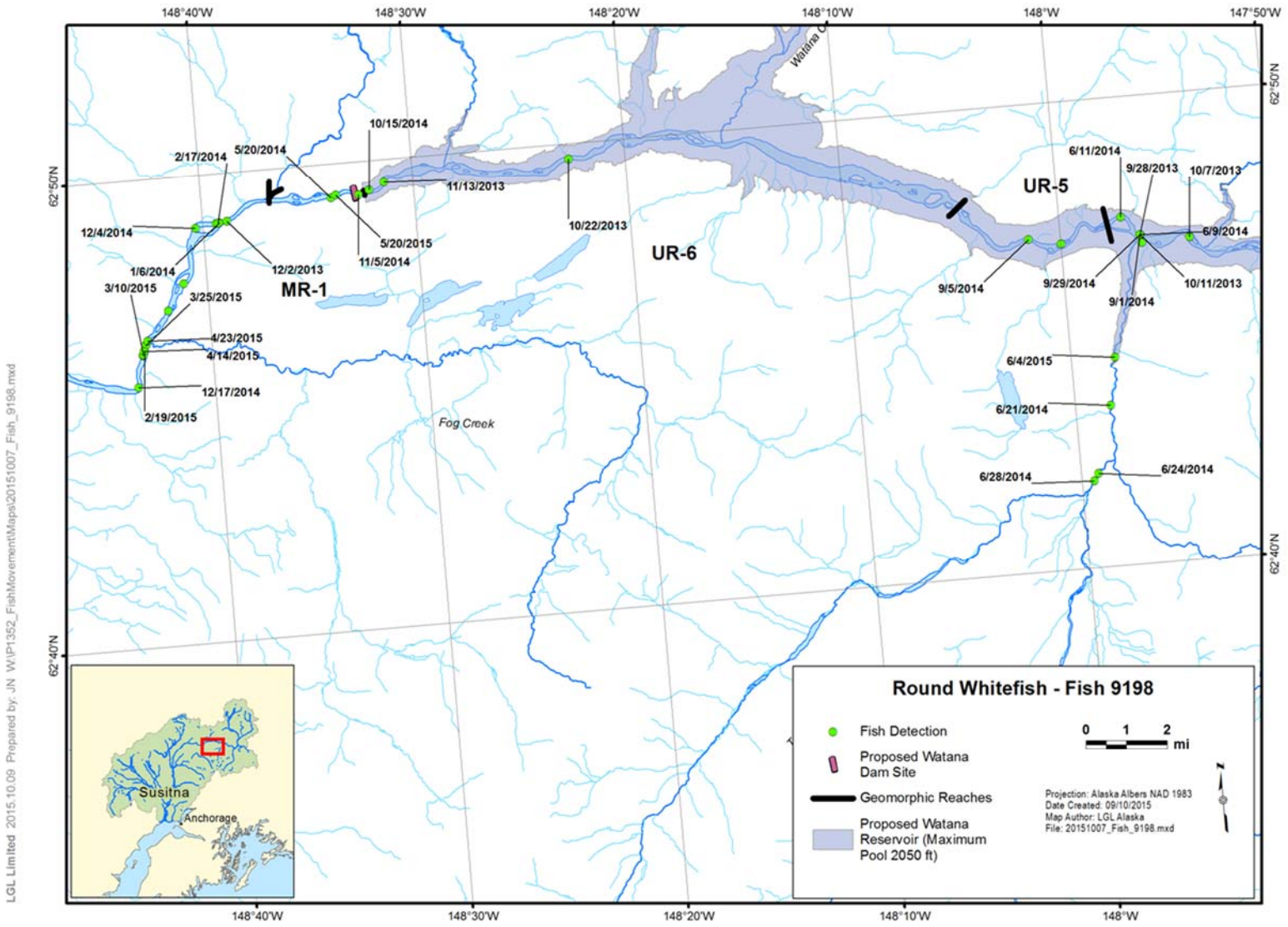

Figure 5.9-4. Tracking history for Fish 9198, a Round Whitefish tagged in the Upper River.

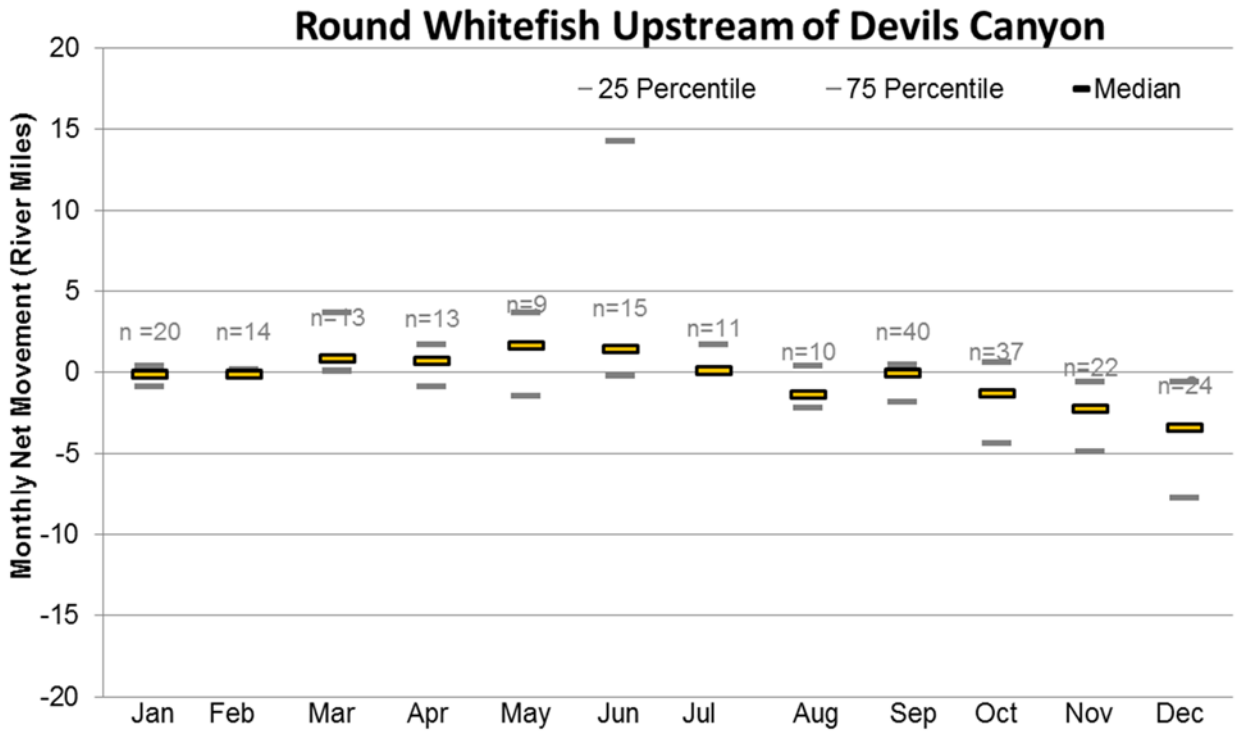

Figure 5.9-5. Net upstream and downstream movements for the tagged population of Round Whitefish upstream of Devils Canyon by study month (n, number of fish detected each month).

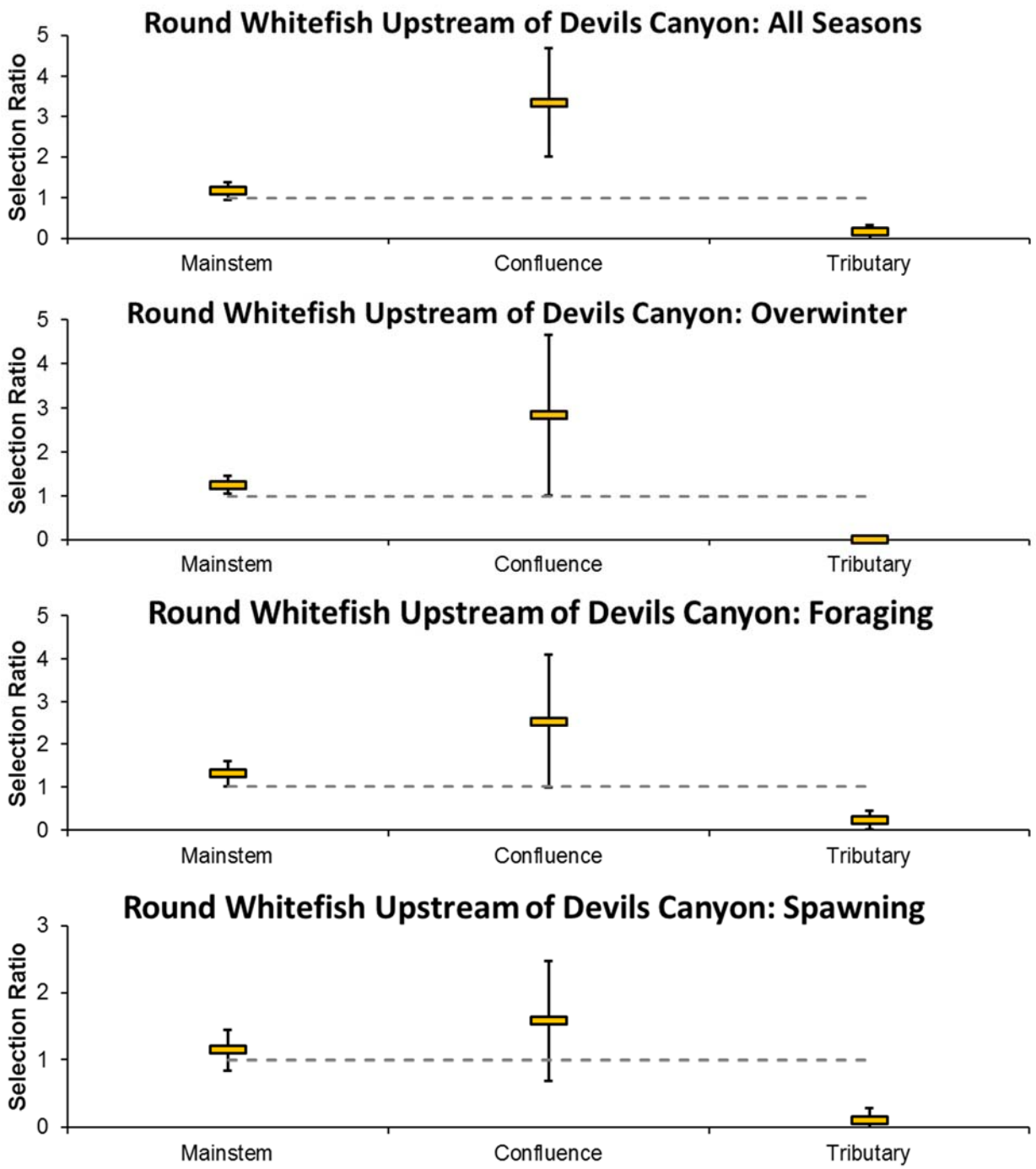

Figure 5.9-6. Habitat selection ratios with 95% Bonferroni confidence intervals for Rainbow Trout tagged upstream of Devils Canyon.

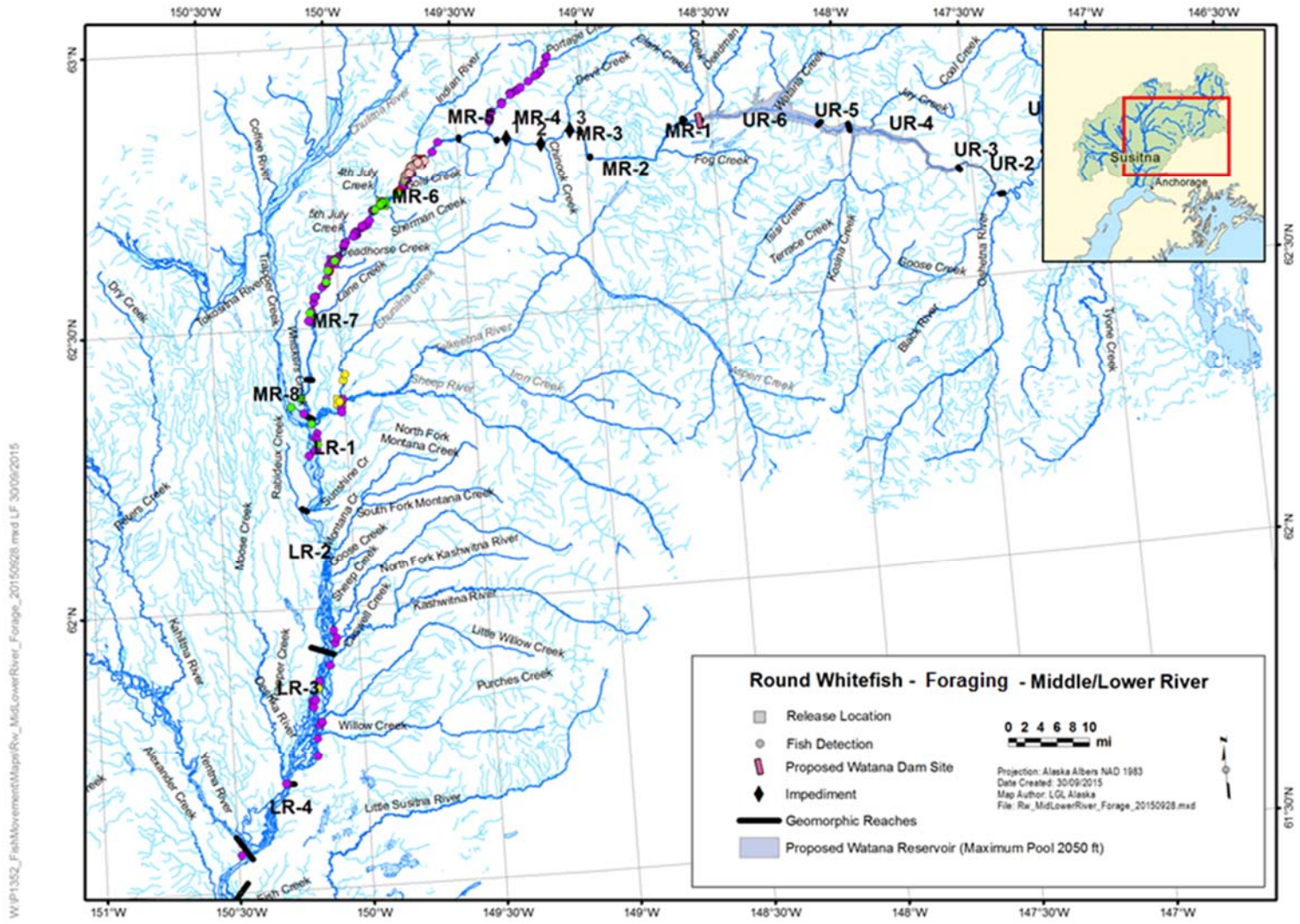

Figure 5.9-7. Locations of Round Whitefish tagged in the Middle and Lower Susitna River, during the foraging period. The color of each detection dot matches the color of the location where the fish was released.

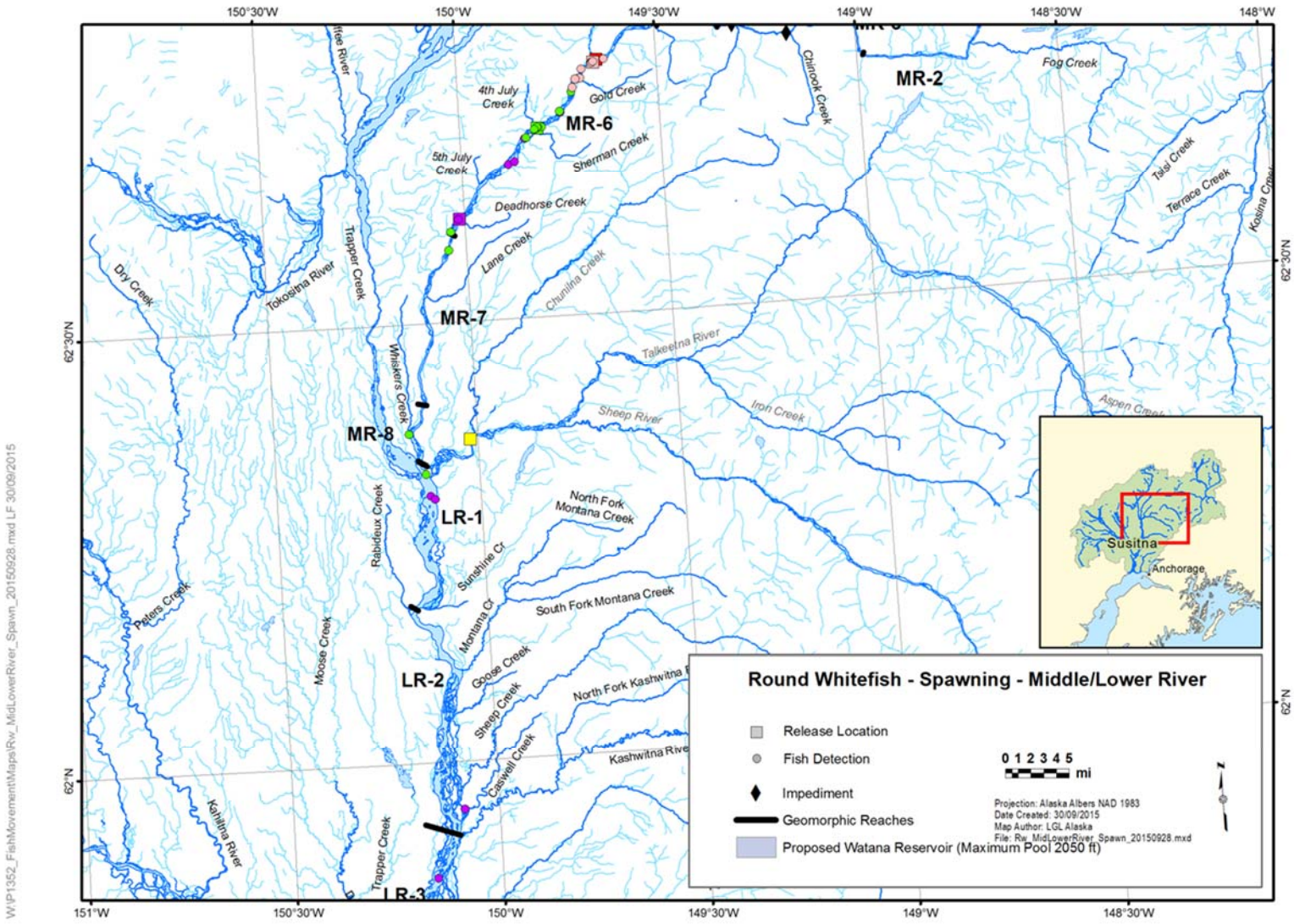

Figure 5.9-8. Locations of Round Whitefish tagged in the Middle and Lower Susitna River, during the spawning period. The color of each detection dot matches the color of the location where the fish was released.

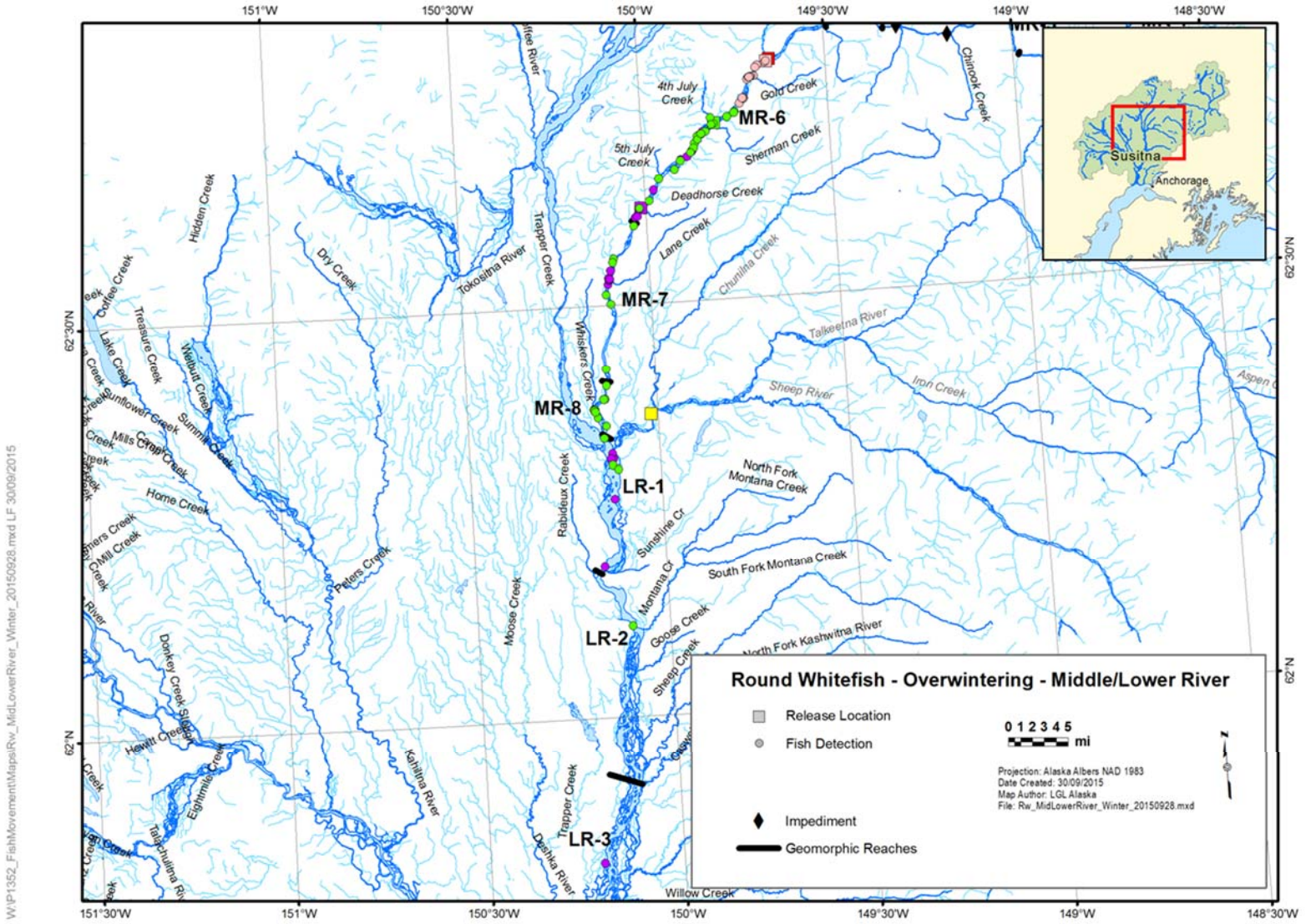

Figure 5.9-9. Locations of Round Whitefish tagged in the Middle and Lower Susitna River, during the overwintering period. The color of each detection dot matches the color of the location where the fish was released.

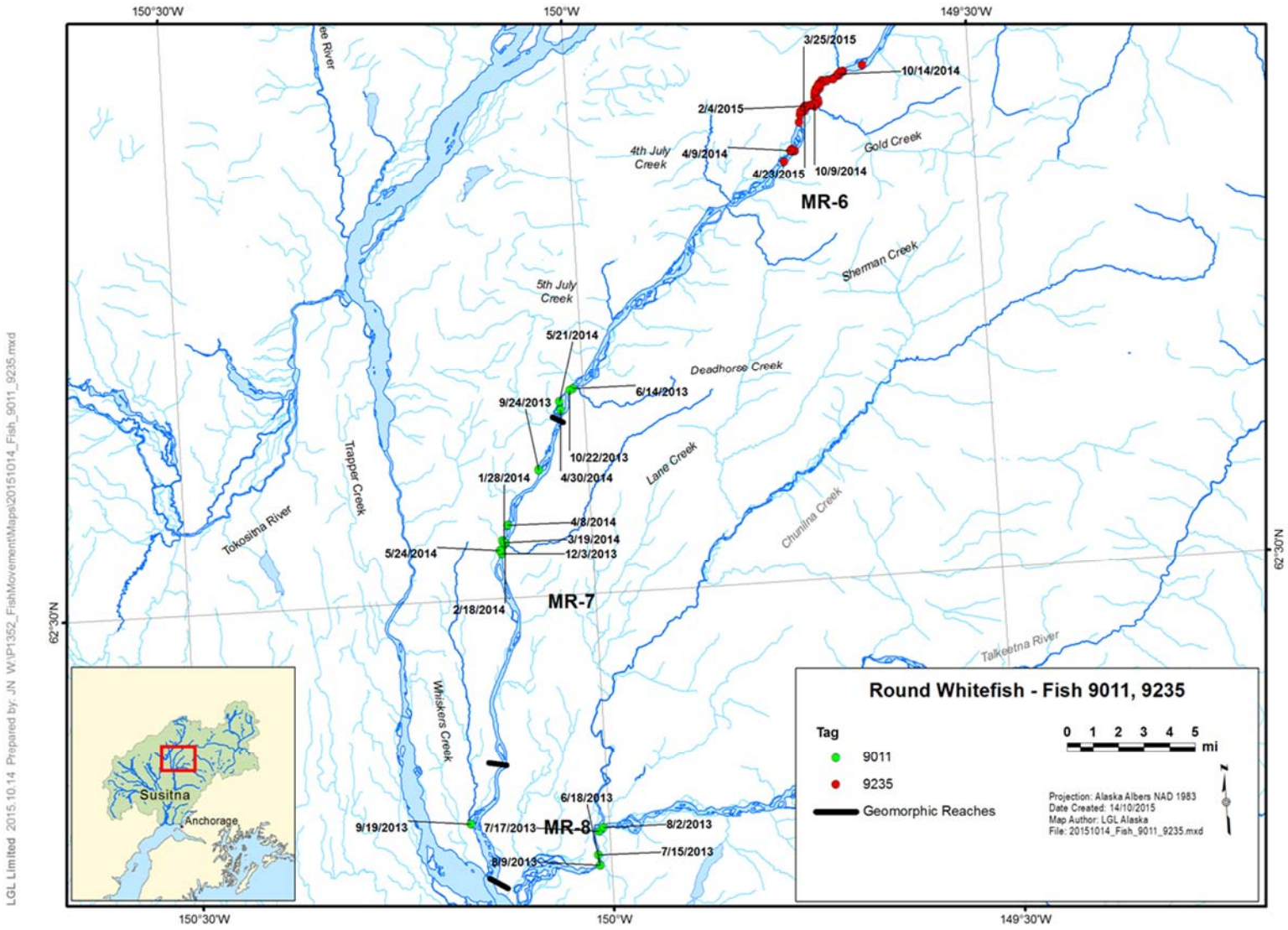

Figure 5.9-10. Tracking history for Fish 9011 and Fish 9235, Round Whitefish tagged in the Middle River.

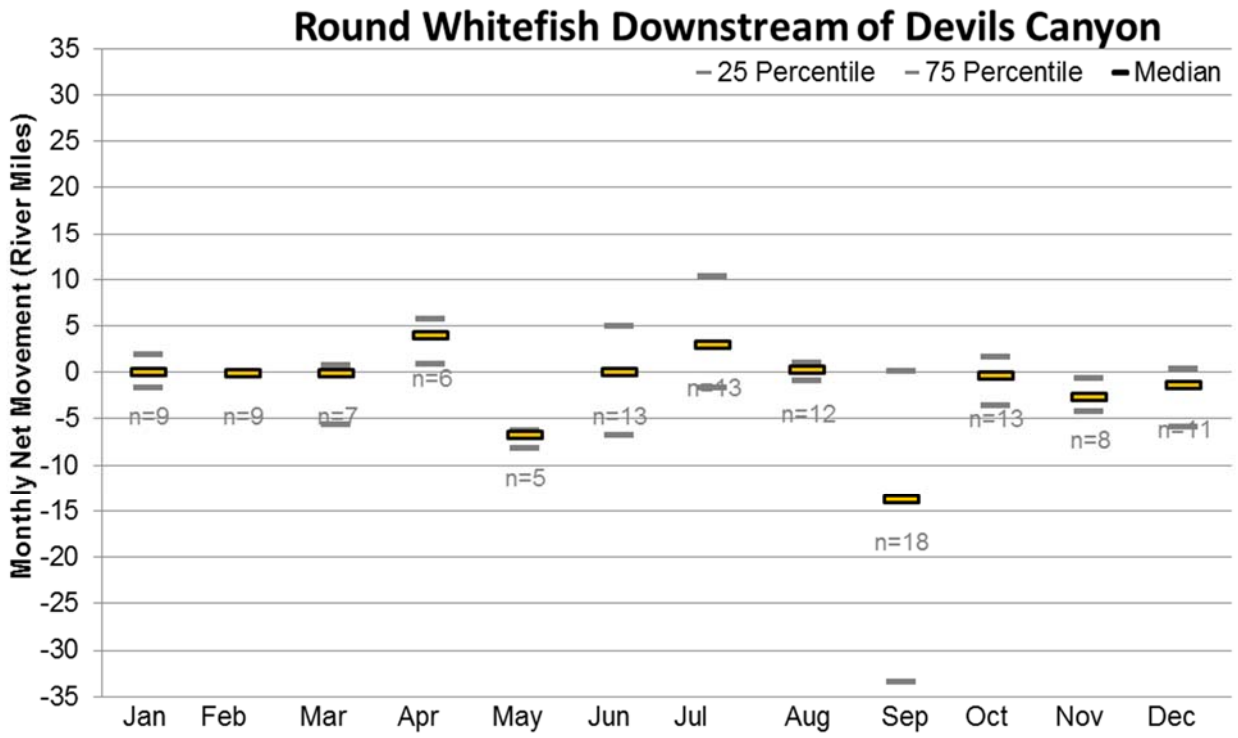

Figure 5.9-11. Net upstream and downstream movements for the tagged population of Round Whitefish downstream of Devils Canyon by study month (n, number of fish detected each month).

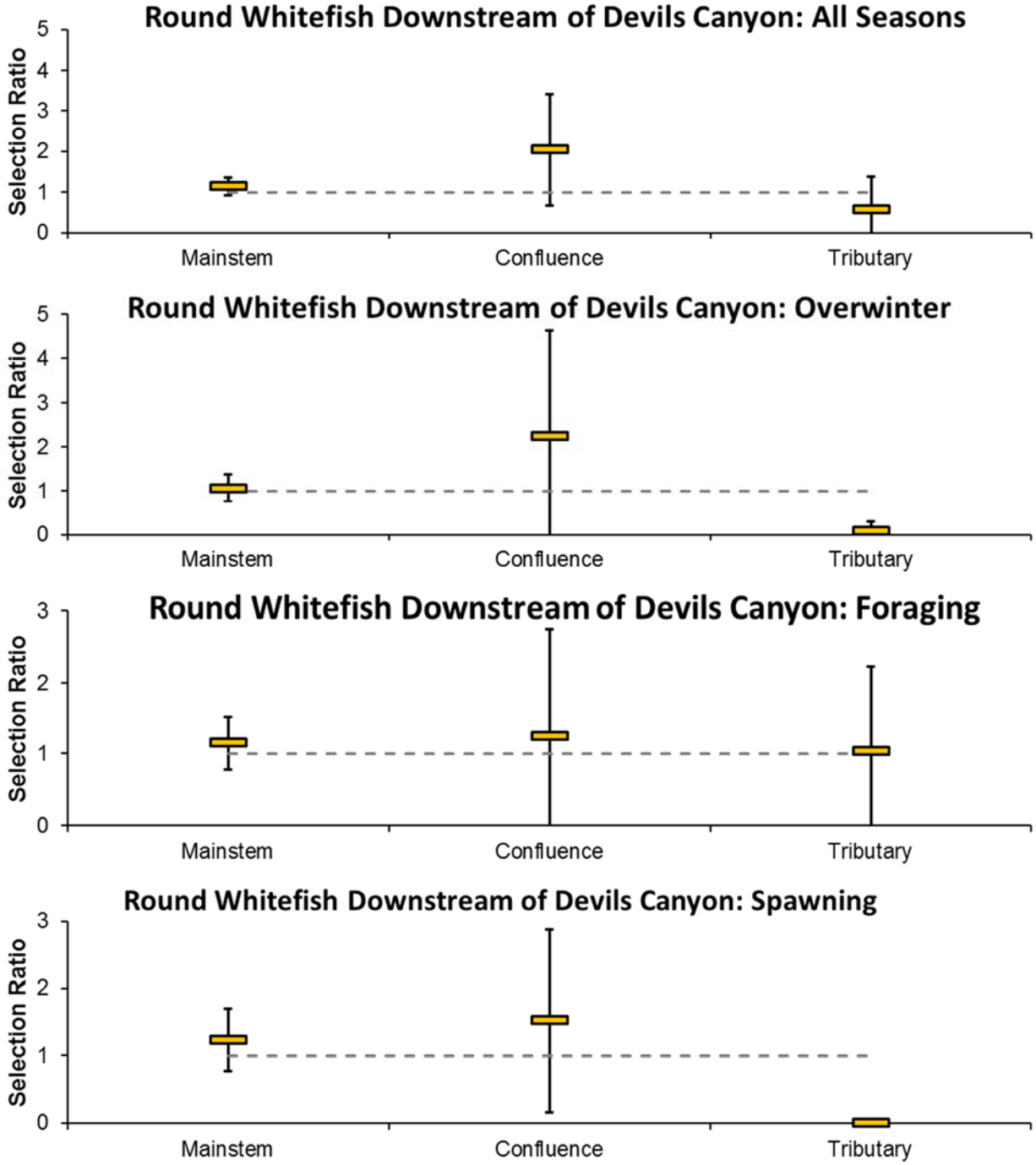

Figure 5.9-12. Habitat selection ratios with 95% Bonferroni confidence intervals for Rainbow Trout tagged downstream of Devils Canyon.

APPENDIX A. SUPPLEMENTAL TABLES

LIST OF TABLES

Table A-1. List of mobile tracking surveys conducted in the Upper River during 2013, 2014, and 2015, by location and date. "H" designates a survey that was conducted with a helicopter. Surveys on this page are from 2013.

Zone	From	To	7-18	7-19	7-20	7-21	7-22	7-23	7-24	7-25	7-26	7-27	7-28	7-29	7-30	7-31	8-01	8-06	8-13	8-19	8-26	9-02	9-09	9-16	9-23	9-30	10-07	10-21	10-22	11-11	11-12	11-13	12-02	12-18
Geomorphic Reach MR-1/UR-6	187.1																																	
MOB - Dam Site - Deadman	187.1	189.4	H	H	H	H	H				H	H	H			H	H	H	H	H	H	H	H	H	H	H	H	H				H	H
MOB - Deadman Creek	189.4	-															H	H	H	H	H	H	H	H	H		H	H			H	H	H	
MOB - Deadman - Watana	189.4	196.9	H	H	H						H					H	H	H	H	H	H	H	H	H	H	H	H		H		H		H	H
MOB - 'Creek 192'	194.8	-																	H	H	H										H		H	
MOB - Watana Creek	196.9	-															H	H	H	H	H	H	H	H	H	H	H		H		H		H	
MOB - Wantana - Kosina	196.9	209.1	H	H	H						H					H	H	H	H	H	H	H	H	H	H	H	H		H		H		H	H
Geomorphic Reach UR-6/UR-5 Boundary	203.4																																	
Geomorphic Reach UR-5/UR-4 Boundary	208.1																																	
MOB - Kosina Creek	209.1	-														H		H	H	H	H	H	H	H	H	H	H	H		H			H	
MOB - Kosina - Jay Creek	209.1	211		H												H		H	H	H	H	H	H	H	H	H	H	H					H	H
MOB - Jay Creek	211	-																		H	H				H	H	H	H					H	H
MOB - Jay - Goose	211	232.9		H	H											H		H	H	H	H	H	H	H	H	H	H	H		H				
Geomorphic Reach UR-4/UR-3 Boundary	224.9																																	
Inundation Zone Maximum Pool	232.5																																	
MOB - Goose Creek (Upper River)	232.9	-														H		H	H	H	H	H	H	H	H	H	H	H		H				
MOB - Goose - Oshetna	232.9	235.1			H											H		H	H	H	H	H	H	H	H	H	H	H		H				
Geomorphic Reach UR-3/UR-2 Boundary	234.5																																	
MOB - Oshetna River	235.1	-			H											H		H	H	H	H	H	H	H	H	H	H	H		H				
MOB - Oshetna - Tyone	235.1	247.3			H	H	H	H								H		H												H				
MOB - Tyone River	247.3	-																												H				
MOB - Tyone - Clearwater Cr	247.3	266.6				H	H	H	H						H																			
Geomorphic Reach UR-2/UR-1 Boundary	248.6																																	
Geomorphic Reach UR-1 Boundary	261.3																																	
MOB - Clearwater Creek	266.6	-					H								H																			
MOB - above Clearwater Cr	266.6	-					H	H	H	H	H	H	H	H	H	H		H																

Table A-1. Continued. Surveys on this page are from 2014.

Zone	From	To	1-06	1-28	1-29	2-17	3-18	4-09	4-30	5-20	6-11	6-12	6-16	6-21	6-24	6-25	6-28	7-10	7-14	7-17	7-25	8-01	8-03	8-06	8-09	8-12	8-15	8-18	8-21	8-30
Geomorphic Reach MR-1/UR-6	187.1																													
MOB - Dam Site - Deadman	187.1	189.4	H	H		H	H	H	H	H	H		H	H		H	H	H		H	H	H	H	H			H	H	H	H
MOB - Deadman Creek	189.4	-		H			H			H	H		H	H		H		H		H	H	H	H	H			H	H	H	H
MOB - Deadman - Watana	189.4	196.9	H	H		H	H	H	H	H	H		H	H		H	H	H		H	H	H	H	H			H	H	H	H
MOB - 'Creek 192'	194.8	-								H								H		H							H		H	
MOB - Watana Creek	196.9	-	H	H		H	H	H	H	H	H		H	H	H	H	H	H		H	H	H	H	H			H	H	H	H
MOB - Wantana - Kosina	196.9	209.1	H	H		H	H	H	H	H	H		H	H	H		H	H		H	H	H	H	H		H	H	H	H	H
Geomorphic Reach UR-6/UR-5 Boundary	203.4																													
Geomorphic Reach UR-5/UR-4 Boundary	208.1																													
MOB - Kosina Creek	209.1	-	H	H		H	H	H	H	H	H		H	H	H		H	H		H	H		H	H		H	H	H	H	H
MOB - Kosina - Jay Creek	209.1	211	H	H		H	H	H	H	H	H		H	H	H			H		H	H		H			H			H	H
MOB - Jay Creek	211	-				H	H	H		H	H		H	H	H			H		H	H		H						H	H
MOB - Jay - Goose	211	232.9	H	H	H	H	H	H	H	H	H		H	H	H			H			H		H			H			H	H
Geomorphic Reach UR-4/UR-3 Boundary	224.9																													
Inundation Zone Maximum Pool	232.5																													
MOB - Goose Creek (Upper River)	232.9	-				H	H	H	H	H	H		H	H	H			H			H		H		H	H			H	H
MOB - Goose - Oshetna	232.9	235.1			H	H	H	H	H	H	H		H	H	H			H			H		H		H	H			H	H
Geomorphic Reach UR-3/UR-2 Boundary	234.5																													
MOB - Oshetna River	235.1	-				H	H	H	H	H	H		H	H	H			H			H		H			H			H	H
MOB - Oshetna - Tyone	235.1	247.3			H	H	H	H	H	H	H								H							H				
MOB - Tyone River	247.3	-			H	H	H	H	H	H	H								H											
MOB - Tyone - Clearwater Cr	247.3	266.6																	H							H				
Geomorphic Reach UR-2/UR-1 Boundary	248.6																													
Geomorphic Reach UR-1 Boundary	261.3																													
MOB - Clearwater Creek	266.6	-																	H											
MOB - above Clearwater Cr	266.6	-																	H											

Table A-1. Continued. Surveys on this page are from 2014 and 2015.

Zone	From	To	9-05	9-17	10-02	10-14	11-04	11-05	12-03	12-04	12-16	1-06	2-03	2-19	3-10	3-25	4-14	4-23	5-20	6-04	6-23
Geomorphic Reach MR-1/UR-6	187.1																				
MOB - Dam Site - Deadman	187.1	189.4	H	H	H	H	H	H		H	H	H	H	H	H	H	H	H	H	H	H
MOB - Deadman Creek	189.4	-	H	H	H	H		H					H						H		H
MOB - Deadman - Watana	189.4	196.9	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
MOB - 'Creek 192'	194.8	-		H															H		H
MOB - Watana Creek	196.9	-	H	H	H	H	H				H	H	H	H	H	H	H	H	H	H	H
MOB - Wantana - Kosina	196.9	209.1	H	H	H	H	H		H		H	H	H	H	H	H	H	H	H	H	H
Geomorphic Reach UR-6/UR-5 Boundary	203.4																				
Geomorphic Reach UR-5/UR-4 Boundary	208.1																				
MOB - Kosina Creek	209.1	-	H	H	H	H	H				H	H	H	H	H	H	H	H	H	H	H
MOB - Kosina - Jay Creek	209.1	211	H	H	H	H	H		H		H	H	H	H	H	H	H	H	H	H	H
MOB - Jay Creek	211	-	H	H	H	H	H				H	H	H	H	H	H	H	H	H	H	
MOB - Jay - Goose	211	232.9	H	H	H	H	H		H		H	H	H	H	H	H	H	H	H	H	H
Geomorphic Reach UR-4/UR-3 Boundary	224.9																				
Inundation Zone Maximum Pool	232.5																				
MOB - Goose Creek (Upper River)	232.9	-	H	H	H	H	H						H	H	H		H	H	H	H	H
MOB - Goose - Oshetna	232.9	235.1	H	H	H	H	H		H		H	H	H	H	H	H	H	H	H	H	H
Geomorphic Reach UR-3/UR-2 Boundary	234.5																				
MOB - Oshetna River	235.1	-	H	H	H	H	H		H		H	H	H	H	H	H	H	H	H	H	H
MOB - Oshetna - Tyone	235.1	247.3		H	H	H	H		H		H	H	H	H	H	H	H	H	H	H	H
MOB - Tyone River	247.3	-		H	H	H	H		H		H	H	H	H	H	H	H	H	H	H	H
MOB - Tyone - Clearwater Cr	247.3	266.6							H		H	H	H	H	H	H	H	H	H	H	H
Geomorphic Reach UR-2/UR-1 Boundary	248.6																				
Geomorphic Reach UR-1 Boundary	261.3																				
MOB - Clearwater Creek	266.6	-																			
MOB - above Clearwater Cr	266.6	-																			

Table A-2. List of mobile tracking surveys conducted in the Middle and Lower River during 2013, 2014, and 2015, by location and date. "H" designates a survey that was conducted with a helicopter. Surveys on this page are from 2013.

Zone	PRM From	PRM To	6-22	6-23	6-25	6-26	6-28	6-29	6-30	7-01	7-02	7-03	7-04	7-05	7-06	7-07	7-08	7-09	7-10	7-11	7-12	7-13	7-14	7-15
MOB - Little Susitna River	-	-																						
MOB - Beyond Confluence	-	-																						
MOB - Confluence - Yentna	3.5	32.4																	H					
Geomorphic Reach LR-5/LR-4 Boundary	32.3																							
MOB - Yentna River	32.4	-		H			H						H											
MOB - Yentna - Deshka	32.4	45		H			H						H											
Geomorphic Reach LR-4/LR-3 Boundary	44.6																							
MOB - Deshka River	44.9	-		H			H						H											
MOB - Willow and Little Willow cr	52.2	55.6		H			H						H						H					
MOB - Kashwitna River	64.7	-		H			H					H												
MOB - Deshka - Kashwitna	45	64.7		H			H					H	H											
Geomorphic Reach LR-3/LR-2 Boundary	65.6																							
MOB - Caswell Creek	67.4	-										H												
MOB - Sheep Creek	70.1	-										H							H					
MOB - Goose Creek	76.9	-																						
MOB - Kashwitna - Montana	64.7	80.7		H			H					H							H					
MOB - Montana Creek	80.9	-		H			H												H					
MOB - Montana - Sunshine	80.7	88.5		H			H					H							H					
MOB - Sunshine Creek	88.1	-																						
MOB - Rabideux Creek	87.4	-		H								H												
Geomorphic Reach LR-2/LR-1 Boundary	87.9																							
MOB - Birch Creek	93.5	-																						
MOB - Talkeetna River	101	-		H			H					H												
MOB - Chulitna River	101.7	-		H																				H
MOB - Sunshine - Talkeetna	88.5	102.3		H			H					H							H					
MOB - Talkeetna - Lane	102.3	116.8	H				H					H						H	H					H
Geomorphic Reach LR-1/MR-8 Boundary	102.4																							
MOB - Whiskers Creek	104.8	-																						H
Geomorphic Reach MR-8/MR-7 Boundary	107.8																							
MOB - Trib off zone 95	110.5	-																						
MOB - Lane - Gateway	116.8	130.1	H		H	H	H	H		H	H	H		H		H		H					H	H
MOB - Lane Creek	117.1	-																						H
Geomorphic Reach MR-7/MR-6 Boundary	122.7																							
MOB - 5th of July Creek	127.3	-																						
MOB - Slough 8A	129.2	129.8																						
MOB - Gateway - 4th of July	130.1	134.3	H		H	H	H	H		H	H	H		H		H		H					H	
MOB - Slough 9	131.4	133.5																						
MOB - Sherman Creek	134.1	-																						
MOB - 4th of July Creek	134.3	-	H		H		H					H											H	
MOB - 4th of July - Slough 11	134.3	140.2	H		H	H	H	H		H	H	H		H		H		H					H	
MOB - Slough 11	138.6	-										H												
MOB - Gold Creek	140.1	-																						
MOB - Slough11 - Indian	140.1	142.1	H		H	H	H	H		H	H	H		H		H	H	H				H	H	
MOB - Indian trib	141.8	-	H		H	H	H	H		H		H					H	H				H	H	
MOB - Indian - Slough 21	142.1	145.7	H		H	H	H			H	H			H		H	H	H				H	H	
MOB - Slough 21	145.1	145.6																						
MOB - above Powerline	145.7	146	H		H	H	H			H	H			H		H	H					H	H	
MOB - abv Powerline - Portage	146	152.3	H		H	H	H	H		H	H		H	H	H	H	H		H	H	H	H	H	
MOB - Jack Long Creek	148.2	-			H						H					H						H	H	
Geomorphic Reach MR-6/MR-5 Boundary	148.4																							
MOB - Portage trib	152.3	-	H		H	H		H		H	H		H			H	H	H	H	H	H	H	H	H
MOB - Portage - Impediment1	152.3	155.2	H		H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
Geomorphic Reach MR-5/MR-4 Boundary	153.9																							
MOB - Impediment1 - Cheechako	155.2	157.4	H		H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
MOB - Cheechako Creek	155.9	-			H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
MOB - Cheechako - Impediment2	157.4	160.2	H		H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
MOB - Impediment2 - Chinook	160.2	160.5	H		H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
MOB - Chinook Creek	160.4	-			H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
MOB - Chinook - Impediment3	160.5	164.8	H		H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
MOB - Devils Creek	164.8	-			H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
MOB - Impediment3 - Devil Stn	164.8	166.9	H		H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
Geomorphic Reach MR-4/MR-3 Boundary	166.1																							
MOB - Devil Stn - Fog	166.9	179.4									H				H	H					H		H	H
Geomorphic Reach MR-3/MR-2 Boundary	169.6																							
MOB - Fog Creek	179.3	-																					H	
MOB - Fog - Dam Site	179.4	186.8									H				H						H		H	H
MOB - Tsusena Creek	184.5	-																					H	
Geomorphic Reach MR-2/MR-1 Boundary	184.6																							
Geomorphic Reach MR-1/UR-6	187.1																							

Table A-2. Continued. Surveys on this page are from 2013.

Zone	PRM From	PRM To	7-16	7-17	7-18	7-19	7-20	7-21	7-22	7-23	7-24	7-25	7-26	7-27	7-28	7-29	7-30	7-31	8-01	8-02	8-03	8-04	8-05	8-06
MOB - Little Susitna River	-	-																						
MOB - Beyond Confluence	-	-																						
MOB - Confluence - Yentna	3.5	32.4																						
Geomorphic Reach LR-5/LR-4 Boundary	32.3																							
MOB - Yentna River	32.4	-		H								H								H				
MOB - Yentna - Deshka	32.4	45		H								H								H				
Geomorphic Reach LR-4/LR-3 Boundary	44.6																							
MOB - Deshka River	44.9	-		H								H								H				
MOB - Willow and Little Willow cr	52.2	55.6		H								H							H					
MOB - Kashwitna River	64.7	-																	H					
MOB - Deshka - Kashwitna	45	64.7		H								H							H					
Geomorphic Reach LR-3/LR-2 Boundary	65.6																							
MOB - Caswell Creek	67.4	-																						
MOB - Sheep Creek	70.1	-										H							H					
MOB - Goose Creek	76.9	-																	H					
MOB - Kashwitna - Montana	64.7	80.7		H								H							H					
MOB - Montana Creek	80.9	-		H								H							H					
MOB - Montana - Sunshine	80.7	88.5		H								H							H					
MOB - Sunshine Creek	88.1	-																						
MOB - Rabideux Creek	87.4	-																	H					
Geomorphic Reach LR-2/LR-1 Boundary	87.9																							
MOB - Birch Creek	93.5	-																						
MOB - Talkeetna River	101	-		H							H									H				
MOB - Chulitna River	101.7	-									H								H					
MOB - Sunshine - Talkeetna	88.5	102.3		H								H							H					
MOB - Talkeetna - Lane	102.3	116.8									H						H		H				H	
Geomorphic Reach LR-1/MR-8 Boundary	102.4																							
MOB - Whiskers Creek	104.8	-																	H				H	
Geomorphic Reach MR-8/MR-7 Boundary	107.8																							
MOB - Trib off zone 95	110.5	-																						
MOB - Lane - Gateway	116.8	130.1									H						H	H					H	
MOB - Lane Creek	117.1	-									H						H	H					H	
Geomorphic Reach MR-7/MR-6 Boundary	122.7																							
MOB - 5th of July Creek	127.3	-																						
MOB - Slough 8A	129.2	129.8									H						H						H	
MOB - Gateway - 4th of July	130.1	134.3									H						H	H					H	
MOB - Slough 9	131.4	133.5									H						H						H	
MOB - Sherman Creek	134.1	-									H							H						
MOB - 4th of July Creek	134.3	-									H						H	H					H	
MOB - 4th of July - Slough 11	134.3	140.2									H						H	H					H	
MOB - Slough 11	138.6	-															H						H	
MOB - Gold Creek	140.1	-					H											H					H	
MOB - Slough11 - Indian	140.1	142.1					H				H						H	H					H	
MOB - Indian trib	141.8	-					H				H			H				H					H	
MOB - Indian - Slough 21	142.1	145.7					H				H			H			H	H					H	
MOB - Slough 21	145.1	145.6					H				H			H			H						H	
MOB - above Powerline	145.7	146					H				H			H			H	H					H	
MOB - abv Powerline - Portage	146	152.3					H				H			H			H	H					H	
MOB - Jack Long Creek	148.2	-					H											H					H	
Geomorphic Reach MR-6/MR-5 Boundary	148.4																							
MOB - Portage trib	152.3	-	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
MOB - Portage - Impediment1	152.3	155.2	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
Geomorphic Reach MR-5/MR-4 Boundary	153.9																							
MOB - Impediment1 - Cheechako	155.2	157.4	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
MOB - Cheechako Creek	155.9	-	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
MOB - Cheechako - Impediment2	157.4	160.2	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
MOB - Impediment2 - Chinook	160.2	160.5	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
MOB - Chinook Creek	160.4	-	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
MOB - Chinook - Impediment3	160.5	164.8	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
MOB - Devils Creek	164.8	-	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
MOB - Impediment3 - Devil Stn	164.8	166.9	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
Geomorphic Reach MR-4/MR-3 Boundary	166.1																							
MOB - Devil Stn - Fog	166.9	179.4	H	H	H	H	H	H	H	H	H		H	H	H		H	H	H	H	H			H
Geomorphic Reach MR-3/MR-2 Boundary	169.6																							
MOB - Fog Creek	179.3	-						H					H											H
MOB - Fog - Dam Site	179.4	186.8	H	H	H	H	H	H	H	H	H		H	H			H	H	H	H				H
MOB - Tsusena Creek	184.5	-			H	H					H	H	H	H	H	H	H	H	H	H				H
Geomorphic Reach MR-2/MR-1 Boundary	184.6																							
Geomorphic Reach MR-1/UR-6	187.1																							

Table A-2. Continued. Surveys on this page are from 2013.

Zone	PRM From	PRM To	8-07	8-09	8-10	8-11	8-12	8-13	8-16	8-17	8-19	8-20	8-23	8-24	8-25	8-26	8-27	8-30	8-31	9-02	9-03	9-07	9-08	9-09
MOB - Little Susitna River	-	-																						
MOB - Beyond Confluence	-	-																						
MOB - Confluence - Yentna	3.5	32.4																						
Geomorphic Reach LR-5/LR-4 Boundary	32.3																							
MOB - Yentna River	32.4	-							H				H					H					H	
MOB - Yentna - Deshka	32.4	45		H					H				H					H					H	
Geomorphic Reach LR-4/LR-3 Boundary	44.6																							
MOB - Deshka River	44.9	-		H					H				H					H					H	
MOB - Willow and Little Willow cr	52.2	55.6		H					H				H					H					H	
MOB - Kashwitna River	64.7	-		H					H				H					H					H	
MOB - Deshka - Kashwitna	45	64.7		H					H				H					H					H	
Geomorphic Reach LR-3/LR-2 Boundary	65.6																							
MOB - Caswell Creek	67.4	-																						
MOB - Sheep Creek	70.1	-		H					H															
MOB - Goose Creek	76.9	-																						
MOB - Kashwitna - Montana	64.7	80.7		H					H				H					H					H	
MOB - Montana Creek	80.9	-		H					H				H					H				H		
MOB - Montana - Sunshine	80.7	88.5		H					H				H					H				H		
MOB - Sunshine Creek	88.1	-		H					H				H					H						
MOB - Rabideux Creek	87.4	-							H				H					H				H		
Geomorphic Reach LR-2/LR-1 Boundary	87.9																							
MOB - Birch Creek	93.5	-																						
MOB - Talkeetna River	101	-		H					H				H					H				H		
MOB - Chulitna River	101.7	-		H					H				H					H				H		
MOB - Sunshine - Talkeetna	88.5	102.3		H					H				H		H			H				H		
MOB - Talkeetna - Lane	102.3	116.8		H	H				H						H				H		H	H		
Geomorphic Reach LR-1/MR-8 Boundary	102.4																							
MOB - Whiskers Creek	104.8	-		H	H		H			H		H			H		H		H		H	H		
Geomorphic Reach MR-8/MR-7 Boundary	107.8																							
MOB - Trib off zone 95	110.5	-					H			H		H			H		H		H					
MOB - Lane - Gateway	116.8	130.1			H		H			H		H			H		H		H		H	H		
MOB - Lane Creek	117.1	-			H		H			H		H			H		H		H		H	H		
Geomorphic Reach MR-7/MR-6 Boundary	122.7																							
MOB - 5th of July Creek	127.3	-					H			H		H			H				H					
MOB - Slough 8A	129.2	129.8			H		H			H		H			H		H		H		H	H		
MOB - Gateway - 4th of July	130.1	134.3			H		H			H		H			H		H		H		H	H		
MOB - Slough 9	131.4	133.5			H		H			H		H			H		H		H		H	H		
MOB - Sherman Creek	134.1	-					H								H						H	H		
MOB - 4th of July Creek	134.3	-			H		H			H		H			H		H		H		H	H		
MOB - 4th of July - Slough 11	134.3	140.2			H		H			H		H			H		H		H		H	H		
MOB - Slough 11	138.6	-			H		H			H		H			H		H		H		H	H		
MOB - Gold Creek	140.1	-			H		H			H		H			H		H		H		H	H		
MOB - Slough11 - Indian	140.1	142.1			H		H			H		H		H	H		H		H		H	H		
MOB - Indian trib	141.8	-			H		H			H		H		H	H		H		H		H	H		
MOB - Indian - Slough 21	142.1	145.7			H		H			H		H		H			H		H		H	H		
MOB - Slough 21	145.1	145.6			H		H			H		H		H			H		H		H	H		
MOB - above Powerline	145.7	146			H		H			H		H		H			H		H		H	H		
MOB - abv Powerline - Portage	146	152.3			H		H			H		H		H			H		H		H	H		
MOB - Jack Long Creek	148.2	-			H		H			H		H		H			H		H		H	H		
Geomorphic Reach MR-6/MR-5 Boundary	148.4																							
MOB - Portage trib	152.3	-	H	H	H	H	H	H		H	H	H		H		H	H	H	H	H	H	H		H
MOB - Portage - Impediment1	152.3	155.2	H	H	H	H	H	H	H	H	H	H		H		H	H	H	H	H	H	H		H
Geomorphic Reach MR-5/MR-4 Boundary	153.9																							
MOB - Impediment1 - Cheechako	155.2	157.4	H	H	H	H	H	H	H	H	H	H		H		H	H	H	H	H	H	H		H
MOB - Cheechako Creek	155.9	-	H	H	H	H	H	H	H	H	H	H		H		H	H	H	H	H		H		H
MOB - Cheechako - Impediment2	157.4	160.2	H	H	H	H	H	H	H	H	H	H		H		H	H	H	H	H	H	H		H
MOB - Impediment2 - Chinook	160.2	160.5	H	H	H	H	H	H	H	H	H	H		H		H	H	H	H	H	H	H		H
MOB - Chinook Creek	160.4	-	H	H	H	H	H	H	H	H	H	H		H		H	H	H	H	H		H		H
MOB - Chinook - Impediment3	160.5	164.8	H	H	H	H	H	H	H	H	H	H		H		H	H	H	H	H	H	H		H
MOB - Devils Creek	164.8	-	H	H	H	H	H	H	H	H	H	H		H		H	H	H	H	H		H		H
MOB - Impediment3 - Devil Stn	164.8	166.9	H	H	H		H	H	H	H	H	H		H		H	H	H	H	H	H	H		H
Geomorphic Reach MR-4/MR-3 Boundary	166.1																							
MOB - Devil Stn - Fog	166.9	179.4						H			H					H				H				H
Geomorphic Reach MR-3/MR-2 Boundary	169.6																							
MOB - Fog Creek	179.3	-						H			H					H				H				H
MOB - Fog - Dam Site	179.4	186.8						H			H					H				H				H
MOB - Tsusena Creek	184.5	-						H			H					H				H				H
Geomorphic Reach MR-2/MR-1 Boundary	184.6																							
Geomorphic Reach MR-1/UR-6	187.1																							

Table A-2. Continued. Surveys on this page are from 2013.

Zone	PRM From	PRM To	9-10	9-13	9-16	9-17	9-20	9-23	9-24	9-27	9-30	10-01	10-02	10-07	10-09	10-21	10-22	10-23	10-24	11-13	11-15	11-16	12-02	12-03
MOB - Little Susitna River	-	-																						
MOB - Beyond Confluence	-	-																						
MOB - Confluence - Yentna	3.5	32.4																	H			H		
Geomorphic Reach LR-5/LR-4 Boundary	32.3																							
MOB - Yentna River	32.4	-		H			H			H			H						H			H		
MOB - Yentna - Deshka	32.4	45		H			H			H			H						H			H		
Geomorphic Reach LR-4/LR-3 Boundary	44.6																							
MOB - Deshka River	44.9	-		H			H			H			H						H			H		
MOB - Willow and Little Willow cr	52.2	55.6		H			H			H			H						H			H		
MOB - Kashwitna River	64.7	-		H			H						H						H					
MOB - Deshka - Kashwitna	45	64.7		H			H			H			H						H			H		
Geomorphic Reach LR-3/LR-2 Boundary	65.6																							
MOB - Caswell Creek	67.4	-																						
MOB - Sheep Creek	70.1	-																	H					
MOB - Goose Creek	76.9	-																						
MOB - Kashwitna - Montana	64.7	80.7		H			H			H			H						H			H		
MOB - Montana Creek	80.9	-		H			H			H			H		H				H			H		
MOB - Montana - Sunshine	80.7	88.5		H			H			H			H		H				H			H		
MOB - Sunshine Creek	88.1	-		H															H		H			
MOB - Rabideux Creek	87.4	-		H			H			H			H		H				H					
Geomorphic Reach LR-2/LR-1 Boundary	87.9																							
MOB - Birch Creek	93.5	-																						
MOB - Talkeetna River	101	-		H			H			H			H		H				H		H			
MOB - Chulitna River	101.7	-		H			H			H			H		H			H			H			
MOB - Sunshine - Talkeetna	88.5	102.3		H			H			H			H		H			H			H			
MOB - Talkeetna - Lane	102.3	116.8	H	H		H	H		H	H		H	H		H			H			H			
Geomorphic Reach LR-1/MR-8 Boundary	102.4																							
MOB - Whiskers Creek	104.8	-	H	H		H	H		H			H			H			H			H			H
Geomorphic Reach MR-8/MR-7 Boundary	107.8																							
MOB - Trib off zone 95	110.5	-																H						H
MOB - Lane - Gateway	116.8	130.1	H			H			H			H			H		H				H			H
MOB - Lane Creek	117.1	-	H			H			H			H			H		H				H			H
Geomorphic Reach MR-7/MR-6 Boundary	122.7																							
MOB - 5th of July Creek	127.3	-																						H
MOB - Slough 8A	129.2	129.8	H			H			H			H			H		H				H			H
MOB - Gateway - 4th of July	130.1	134.3	H			H			H			H			H		H				H			H
MOB - Slough 9	131.4	133.5	H			H						H			H		H				H			H
MOB - Sherman Creek	134.1	-	H																					
MOB - 4th of July Creek	134.3	-	H			H			H			H			H		H				H			H
MOB - 4th of July - Slough 11	134.3	140.2	H			H			H			H			H		H				H			H
MOB - Slough 11	138.6	-	H			H			H			H			H		H				H			H
MOB - Gold Creek	140.1	-	H			H			H			H			H		H				H			H
MOB - Slough11 - Indian	140.1	142.1	H			H			H			H			H		H				H			H
MOB - Indian trib	141.8	-	H			H			H			H					H				H			H
MOB - Indian - Slough 21	142.1	145.7	H			H			H			H			H		H				H			H
MOB - Slough 21	145.1	145.6	H			H			H			H			H		H				H			H
MOB - above Powerline	145.7	146	H			H			H			H			H		H				H			H
MOB - abv Powerline - Portage	146	152.3	H			H			H			H			H		H				H			H
MOB - Jack Long Creek	148.2	-	H			H			H			H			H									H
Geomorphic Reach MR-6/MR-5 Boundary	148.4																							
MOB - Portage trib	152.3	-	H	H	H	H	H	H	H		H	H		H	H		H				H			H
MOB - Portage - Impediment1	152.3	155.2	H	H	H	H	H	H	H		H	H		H	H	H				H				H
Geomorphic Reach MR-5/MR-4 Boundary	153.9																							
MOB - Impediment1 - Cheechako	155.2	157.4	H	H	H	H	H	H	H		H	H		H	H	H				H				H
MOB - Cheechako Creek	155.9	-	H	H	H	H	H	H	H		H	H		H	H	H								H
MOB - Cheechako - Impediment2	157.4	160.2	H	H	H	H	H	H	H		H	H		H	H	H				H				H
MOB - Impediment2 - Chinook	160.2	160.5	H	H	H	H	H	H	H		H	H		H	H	H								H
MOB - Chinook Creek	160.4	-	H	H	H	H	H	H	H		H	H		H	H	H				H				H
MOB - Chinook - Impediment3	160.5	164.8	H	H	H	H	H	H	H		H	H			H	H								H
MOB - Devils Creek	164.8	-	H	H	H	H	H	H	H		H	H			H	H				H				H
MOB - Impediment3 - Devil Stn	164.8	166.9	H	H	H	H	H	H	H		H	H				H				H			H	
Geomorphic Reach MR-4/MR-3 Boundary	166.1																							
MOB - Devil Stn - Fog	166.9	179.4			H			H			H			H		H				H			H	
Geomorphic Reach MR-3/MR-2 Boundary	169.6																							
MOB - Fog Creek	179.3	-			H			H			H			H		H				H			H	
MOB - Fog - Dam Site	179.4	186.8			H			H			H			H		H				H			H	
MOB - Tsusena Creek	184.5	-			H			H			H			H		H				H			H	
Geomorphic Reach MR-2/MR-1 Boundary	184.6																							
Geomorphic Reach MR-1/UR-6	187.1																							

Table A-2. Continued. Surveys on this page are from 2013 and 2014.

Zone	PRM From	PRM To	12-04	12-09	12-16	12-18	12-19	12-21	1-06	1-07	1-28	1-29	1-30	2-17	2-18	2-19	3-18	3-19	3-20	4-08	4-09	4-30	5-01	5-20
MOB - Little Susitna River	-	-																						
MOB - Beyond Confluence	-	-					H																	
MOB - Confluence - Yentna	3.5	32.4		H			H						H							H				
Geomorphic Reach LR-5/LR-4 Boundary	32.3																							
MOB - Yentna River	32.4	-		H			H			H			H			H			H	H			H	
MOB - Yentna - Deshka	32.4	45		H			H			H			H			H			H	H			H	
Geomorphic Reach LR-4/LR-3 Boundary	44.6																							
MOB - Deshka River	44.9	-		H			H						H						H	H			H	
MOB - Willow and Little Willow cr	52.2	55.6		H															H					
MOB - Kashwitna River	64.7	-	H															H						
MOB - Deshka - Kashwitna	45	64.7	H				H			H			H			H		H	H	H			H	
Geomorphic Reach LR-3/LR-2 Boundary	65.6																							
MOB - Caswell Creek	67.4	-																						
MOB - Sheep Creek	70.1	-																						
MOB - Goose Creek	76.9	-																					H	
MOB - Kashwitna - Montana	64.7	80.7	H				H	H		H		H	H			H		H		H			H	
MOB - Montana Creek	80.9	-	H									H			H			H					H	
MOB - Montana - Sunshine	80.7	88.5	H					H		H		H			H	H		H		H			H	
MOB - Sunshine Creek	88.1	-	H									H												
MOB - Rabideux Creek	87.4	-	H									H											H	
Geomorphic Reach LR-2/LR-1 Boundary	87.9																							
MOB - Birch Creek	93.5	-																						
MOB - Talkeetna River	101	-	H			H						H	H					H		H	H		H	
MOB - Chulitna River	101.7	-	H			H				H		H	H		H			H		H			H	
MOB - Sunshine - Talkeetna	88.5	102.3	H		H	H		H		H		H			H			H		H			H	
MOB - Talkeetna - Lane	102.3	116.8	H		H	H				H	H				H			H		H		H		
Geomorphic Reach LR-1/MR-8 Boundary	102.4																							
MOB - Whiskers Creek	104.8	-									H				H			H		H		H		
Geomorphic Reach MR-8/MR-7 Boundary	107.8																							
MOB - Trib off zone 95	110.5	-			H																			
MOB - Lane - Gateway	116.8	130.1			H					H	H				H			H		H		H		
MOB - Lane Creek	117.1	-													H			H		H		H		
Geomorphic Reach MR-7/MR-6 Boundary	122.7																							
MOB - 5th of July Creek	127.3	-																						
MOB - Slough 8A	129.2	129.8			H					H	H				H			H			H	H		
MOB - Gateway - 4th of July	130.1	134.3			H					H	H				H			H			H	H		
MOB - Slough 9	131.4	133.5			H						H										H	H		
MOB - Sherman Creek	134.1	-																						
MOB - 4th of July Creek	134.3	-													H			H			H	H		
MOB - 4th of July - Slough 11	134.3	140.2			H					H	H				H			H			H	H		
MOB - Slough 11	138.6	-			H						H				H			H			H	H		
MOB - Gold Creek	140.1	-															H							
MOB - Slough11 - Indian	140.1	142.1			H	H			H	H	H				H		H				H	H		
MOB - Indian trib	141.8	-									H				H		H				H	H		H
MOB - Indian - Slough 21	142.1	145.7				H			H		H			H			H				H	H		H
MOB - Slough 21	145.1	145.6				H								H										
MOB - above Powerline	145.7	146				H								H			H				H	H		H
MOB - abv Powerline - Portage	146	152.3				H			H		H			H			H				H	H		H
MOB - Jack Long Creek	148.2	-																						
Geomorphic Reach MR-6/MR-5 Boundary	148.4																							
MOB - Portage trib	152.3	-									H			H			H				H	H		H
MOB - Portage - Impediment1	152.3	155.2				H			H		H			H			H				H	H		H
Geomorphic Reach MR-5/MR-4 Boundary	153.9																							
MOB - Impediment1 - Cheechako	155.2	157.4				H			H		H			H			H				H	H		H
MOB - Cheechako Creek	155.9	-															H							
MOB - Cheechako - Impediment2	157.4	160.2				H			H		H			H			H				H	H		H
MOB - Impediment2 - Chinook	160.2	160.5				H			H		H			H			H				H	H		H
MOB - Chinook Creek	160.4	-																						
MOB - Chinook - Impediment3	160.5	164.8				H			H		H			H			H				H	H		H
MOB - Devils Creek	164.8	-												H			H							H
MOB - Impediment3 - Devil Stn	164.8	166.9				H			H		H			H			H				H	H		H
Geomorphic Reach MR-4/MR-3 Boundary	166.1																							
MOB - Devil Stn - Fog	166.9	179.4				H			H		H			H			H				H	H		H
Geomorphic Reach MR-3/MR-2 Boundary	169.6																							
MOB - Fog Creek	179.3	-							H					H			H				H	H		H
MOB - Fog - Dam Site	179.4	186.8				H			H		H			H			H				H	H		H
MOB - Tsusena Creek	184.5	-									H			H			H				H	H		H
Geomorphic Reach MR-2/MR-1 Boundary	184.6																							
Geomorphic Reach MR-1/UR-6	187.1																							

Table A-2. Continued. Surveys on this page are from 2014.

Zone	PRM From	PRM To	5-21	6-11	6-12	6-16	6-17	6-18	6-21	6-22	6-24	6-25	6-26	6-28	6-29	7-01	7-02	7-04	7-05	7-07	7-10	7-11	7-12	7-13
MOB - Little Susitna River	-	-																						
MOB - Beyond Confluence	-	-																						H
MOB - Confluence - Yentna	3.5	32.4			H		H						H		H			H						H
Geomorphic Reach LR-5/LR-4 Boundary	32.3																							
MOB - Yentna River	32.4	-			H		H			H			H		H			H						H
MOB - Yentna - Deshka	32.4	45			H		H			H			H		H			H						H
Geomorphic Reach LR-4/LR-3 Boundary	44.6																							
MOB - Deshka River	44.9	-			H		H			H			H		H			H						H
MOB - Willow and Little Willow cr	52.2	55.6			H		H			H			H		H			H						H
MOB - Kashwitna River	64.7	-			H		H			H			H		H			H						H
MOB - Deshka - Kashwitna	45	64.7			H		H			H			H		H			H						H
Geomorphic Reach LR-3/LR-2 Boundary	65.6																							
MOB - Caswell Creek	67.4	-																						
MOB - Sheep Creek	70.1	-					H			H			H					H						H
MOB - Goose Creek	76.9	-																						H
MOB - Kashwitna - Montana	64.7	80.7			H		H			H			H		H			H						H
MOB - Montana Creek	80.9	-			H		H			H			H		H			H						H
MOB - Montana - Sunshine	80.7	88.5			H		H			H			H		H			H						H
MOB - Sunshine Creek	88.1	-			H		H						H											H
MOB - Rabideux Creek	87.4	-			H		H			H			H		H			H						H
Geomorphic Reach LR-2/LR-1 Boundary	87.9																							
MOB - Birch Creek	93.5	-																						
MOB - Talkeetna River	101	-	H		H		H			H		H			H				H	H				H
MOB - Chulitna River	101.7	-	H		H					H		H			H				H	H				H
MOB - Sunshine - Talkeetna	88.5	102.3			H		H			H		H			H		H		H	H				H
MOB - Talkeetna - Lane	102.3	116.8	H		H		H		H			H		H			H		H	H		H		H
Geomorphic Reach LR-1/MR-8 Boundary	102.4																							
MOB - Whiskers Creek	104.8	-	H		H				H			H		H			H		H	H		H		H
Geomorphic Reach MR-8/MR-7 Boundary	107.8																							
MOB - Trib off zone 95	110.5	-																						
MOB - Lane - Gateway	116.8	130.1	H		H		H		H			H		H			H		H	H	H	H		H
MOB - Lane Creek	117.1	-	H				H		H					H					H	H		H		
Geomorphic Reach MR-7/MR-6 Boundary	122.7																							
MOB - 5th of July Creek	127.3	-	H																		H			
MOB - Slough 8A	129.2	129.8	H			H			H			H		H					H	H	H			
MOB - Gateway - 4th of July	130.1	134.3	H			H			H			H		H			H		H	H	H			
MOB - Slough 9	131.4	133.5	H			H			H			H							H	H	H			
MOB - Sherman Creek	134.1	-																						
MOB - 4th of July Creek	134.3	-	H			H			H			H		H			H		H	H	H			
MOB - 4th of July - Slough 11	134.3	140.2	H			H			H			H		H			H		H	H	H			
MOB - Slough 11	138.6	-	H			H			H			H		H					H	H	H			
MOB - Gold Creek	140.1	-	H			H			H			H		H			H		H	H	H			
MOB - Slough11 - Indian	140.1	142.1	H			H			H			H		H			H		H	H	H			
MOB - Indian trib	141.8	-				H			H			H		H			H		H	H	H			
MOB - Indian - Slough 21	142.1	145.7				H			H			H		H			H		H	H	H			
MOB - Slough 21	145.1	145.6				H			H			H		H			H		H	H	H			
MOB - above Powerline	145.7	146				H			H			H		H			H		H	H	H			
MOB - abv Powerline - Portage	146	152.3				H			H			H		H			H		H	H	H		H	
MOB - Jack Long Creek	148.2	-										H		H			H			H	H			
Geomorphic Reach MR-6/MR-5 Boundary	148.4																							
MOB - Portage trib	152.3	-				H			H			H		H		H	H	H	H	H	H		H	
MOB - Portage - Impediment1	152.3	155.2				H			H			H		H		H	H	H	H	H	H		H	
Geomorphic Reach MR-5/MR-4 Boundary	153.9																							
MOB - Impediment1 - Cheechako	155.2	157.4				H			H		H	H		H		H	H	H	H	H	H		H	
MOB - Cheechako Creek	155.9	-				H					H			H		H	H	H	H	H	H		H	
MOB - Cheechako - Impediment2	157.4	160.2		H		H			H					H		H	H	H	H	H	H		H	
MOB - Impediment2 - Chinook	160.2	160.5		H		H			H					H		H	H	H	H	H	H		H	
MOB - Chinook Creek	160.4	-														H	H	H	H	H	H		H	
MOB - Chinook - Impediment3	160.5	164.8		H		H			H					H		H	H	H	H	H	H		H	
MOB - Devils Creek	164.8	-										H		H		H	H	H	H	H	H		H	
MOB - Impediment3 - Devil Stn	164.8	166.9		H		H			H			H		H		H	H	H	H	H	H		H	
Geomorphic Reach MR-4/MR-3 Boundary	166.1																							
MOB - Devil Stn - Fog	166.9	179.4		H				H	H			H		H							H			
Geomorphic Reach MR-3/MR-2 Boundary	169.6																							
MOB - Fog Creek	179.3	-		H		H			H			H		H							H			
MOB - Fog - Dam Site	179.4	186.8		H		H			H			H		H							H			
MOB - Tsusena Creek	184.5	-		H		H			H			H		H							H			
Geomorphic Reach MR-2/MR-1 Boundary	184.6																							
Geomorphic Reach MR-1/UR-6	187.1																							

Table A-2. Continued. Surveys on this page are from 2014.

Zone	PRM From	PRM To	7-14	7-16	7-17	7-19	7-20	7-22	7-23	7-25	7-26	7-28	7-29	7-31	8-01	8-03	8-04	8-06	8-07	8-09	8-10	8-12	8-13	8-15
MOB - Little Susitna River	-	-																						
MOB - Beyond Confluence	-	-																	H		H			
MOB - Confluence - Yentna	3.5	32.4		H			H		H			H		H					H		H			
Geomorphic Reach LR-5/LR-4 Boundary	32.3																							
MOB - Yentna River	32.4	-		H			H		H			H		H					H		H			
MOB - Yentna - Deshka	32.4	45		H			H		H			H		H					H		H		H	
Geomorphic Reach LR-4/LR-3 Boundary	44.6																							
MOB - Deshka River	44.9	-		H			H		H			H		H					H		H		H	
MOB - Willow and Little Willow cr	52.2	55.6		H			H		H			H		H					H		H		H	
MOB - Kashwitna River	64.7	-		H			H		H			H		H					H		H		H	
MOB - Deshka - Kashwitna	45	64.7		H			H		H			H		H					H		H		H	
Geomorphic Reach LR-3/LR-2 Boundary	65.6																							
MOB - Caswell Creek	67.4	-					H		H			H		H					H		H		H	
MOB - Sheep Creek	70.1	-		H			H		H		H	H		H					H		H		H	
MOB - Goose Creek	76.9	-		H			H				H	H		H					H		H		H	
MOB - Kashwitna - Montana	64.7	80.7		H			H		H		H	H		H					H		H		H	
MOB - Montana Creek	80.9	-		H		H			H		H	H		H					H		H		H	
MOB - Montana - Sunshine	80.7	88.5		H		H			H		H	H		H			H		H		H		H	
MOB - Sunshine Creek	88.1	-		H		H			H		H		H		H		H		H		H		H	
MOB - Rabideux Creek	87.4	-		H		H			H		H	H		H	H		H		H		H		H	
Geomorphic Reach LR-2/LR-1 Boundary	87.9																							
MOB - Birch Creek	93.5	-							H		H		H		H		H				H		H	
MOB - Talkeetna River	101	-		H		H		H	H		H		H		H		H		H		H		H	
MOB - Chulitna River	101.7	-		H		H		H			H		H		H		H		H		H		H	
MOB - Sunshine - Talkeetna	88.5	102.3		H		H		H	H		H		H		H		H		H		H		H	
MOB - Talkeetna - Lane	102.3	116.8		H		H		H			H		H		H		H		H	H	H		H	
Geomorphic Reach LR-1/MR-8 Boundary	102.4																							
MOB - Whiskers Creek	104.8	-		H		H		H			H		H		H		H		H		H		H	
Geomorphic Reach MR-8/MR-7 Boundary	107.8																							
MOB - Trib off zone 95	110.5	-																			H			
MOB - Lane - Gateway	116.8	130.1	H	H	H	H		H			H		H		H		H		H	H		H		
MOB - Lane Creek	117.1	-		H	H	H		H			H		H		H		H		H	H		H		
Geomorphic Reach MR-7/MR-6 Boundary	122.7																							
MOB - 5th of July Creek	127.3	-			H						H									H				
MOB - Slough 8A	129.2	129.8	H		H	H		H			H		H		H	H		H		H		H		
MOB - Gateway - 4th of July	130.1	134.3	H		H	H		H			H		H		H	H		H		H		H		
MOB - Slough 9	131.4	133.5	H		H	H		H			H		H		H	H		H		H		H		
MOB - Sherman Creek	134.1	-																						
MOB - 4th of July Creek	134.3	-	H		H	H		H			H		H		H	H		H		H		H		
MOB - 4th of July - Slough 11	134.3	140.2	H		H	H		H			H		H		H	H		H		H		H		
MOB - Slough 11	138.6	-											H		H	H		H		H		H		
MOB - Gold Creek	140.1	-	H		H	H		H			H		H		H	H		H		H		H		H
MOB - Slough11 - Indian	140.1	142.1	H		H	H		H			H		H		H	H		H		H		H		H
MOB - Indian trib	141.8	-	H		H	H		H			H		H	H	H	H		H		H		H		H
MOB - Indian - Slough 21	142.1	145.7	H		H	H		H			H		H		H	H		H		H		H		H
MOB - Slough 21	145.1	145.6	H		H	H		H		H			H		H	H		H		H		H		H
MOB - above Powerline	145.7	146	H		H	H		H		H			H		H	H		H		H		H		H
MOB - abv Powerline - Portage	146	152.3	H		H	H		H	H	H			H		H	H		H		H		H		H
MOB - Jack Long Creek	148.2	-	H		H	H		H		H			H		H	H		H		H		H		H
Geomorphic Reach MR-6/MR-5 Boundary	148.4																							
MOB - Portage trib	152.3	-	H		H	H		H	H	H			H		H	H	H	H		H		H		H
MOB - Portage - Impediment1	152.3	155.2	H	H	H	H		H	H	H	H	H	H	H	H	H	H	H		H		H		H
Geomorphic Reach MR-5/MR-4 Boundary	153.9																							
MOB - Impediment1 - Cheechako	155.2	157.4	H	H	H	H		H	H	H	H	H	H	H	H	H	H	H		H		H		H
MOB - Cheechako Creek	155.9	-	H	H	H	H		H	H	H	H	H	H	H	H	H	H	H		H		H		H
MOB - Cheechako - Impediment2	157.4	160.2	H	H	H	H		H	H	H	H	H	H	H	H	H	H	H		H		H		H
MOB - Impediment2 - Chinook	160.2	160.5	H	H	H	H		H	H	H	H	H	H	H	H	H	H	H		H		H		H
MOB - Chinook Creek	160.4	-	H	H	H	H		H	H	H	H	H	H	H	H	H	H	H		H		H		H
MOB - Chinook - Impediment3	160.5	164.8	H	H	H	H		H	H	H	H	H	H	H	H	H	H	H		H		H		H
MOB - Devils Creek	164.8	-	H	H	H	H		H	H	H	H	H	H	H	H	H	H	H		H		H		H
MOB - Impediment3 - Devil Stn	164.8	166.9	H	H	H	H		H	H	H	H	H	H	H	H	H	H	H		H		H		H
Geomorphic Reach MR-4/MR-3 Boundary	166.1																							
MOB - Devil Stn - Fog	166.9	179.4			H			H		H				H	H	H		H						H
Geomorphic Reach MR-3/MR-2 Boundary	169.6																							
MOB - Fog Creek	179.3	-			H					H					H	H		H						H
MOB - Fog - Dam Site	179.4	186.8			H			H		H					H	H		H						H
MOB - Tsusena Creek	184.5	-			H					H					H	H		H						H
Geomorphic Reach MR-2/MR-1 Boundary	184.6																							
Geomorphic Reach MR-1/UR-6	187.1																							

Table A-2. Continued. Surveys on this page are from 2014.

Zone	PRM From	PRM To	8-16	8-17	8-18	8-19	8-21	8-22	8-24	8-25	8-27	8-28	8-29	8-30	8-31	9-02	9-03	9-05	9-06	9-08	9-09	9-11	9-14	9-15
MOB - Little Susitna River	-	-																						
MOB - Beyond Confluence	-	-		H		H													H					
MOB - Confluence - Yentna	3.5	32.4		H		H		H		H			H				H		H		H			H
Geomorphic Reach LR-5/LR-4 Boundary	32.3																							
MOB - Yentna River	32.4	-		H		H		H		H			H		H		H		H		H			H
MOB - Yentna - Deshka	32.4	45		H		H		H		H			H		H		H		H		H			H
Geomorphic Reach LR-4/LR-3 Boundary	44.6																							
MOB - Deshka River	44.9	-		H		H		H		H			H		H		H		H		H			H
MOB - Willow and Little Willow cr	52.2	55.6		H		H		H		H			H		H		H		H		H			H
MOB - Kashwitna River	64.7	-	H			H		H		H			H		H		H		H		H			H
MOB - Deshka - Kashwitna	45	64.7	H			H		H		H			H		H		H		H		H			H
Geomorphic Reach LR-3/LR-2 Boundary	65.6																							
MOB - Caswell Creek	67.4	-	H					H		H			H		H		H		H		H			H
MOB - Sheep Creek	70.1	-	H			H		H		H			H		H				H		H			H
MOB - Goose Creek	76.9	-	H			H		H		H		H			H		H		H		H			H
MOB - Kashwitna - Montana	64.7	80.7	H			H		H		H		H			H		H		H		H			H
MOB - Montana Creek	80.9	-	H			H		H		H		H			H		H		H		H			H
MOB - Montana - Sunshine	80.7	88.5	H			H		H		H		H			H		H		H		H			H
MOB - Sunshine Creek	88.1	-	H			H		H		H		H			H		H		H		H			H
MOB - Rabideux Creek	87.4	-	H			H		H		H		H			H		H		H		H			H
Geomorphic Reach LR-2/LR-1 Boundary	87.9																							
MOB - Birch Creek	93.5	-	H			H		H		H		H			H		H		H		H			H
MOB - Talkeetna River	101	-	H			H		H		H		H			H		H		H	H			H	
MOB - Chulitna River	101.7	-	H			H		H		H		H			H				H		H			H
MOB - Sunshine - Talkeetna	88.5	102.3	H			H		H		H		H			H		H		H	H	H			H
MOB - Talkeetna - Lane	102.3	116.8	H			H		H		H	H				H	H			H	H			H	
Geomorphic Reach LR-1/MR-8 Boundary	102.4																							
MOB - Whiskers Creek	104.8	-	H			H		H		H	H				H	H			H	H			H	
Geomorphic Reach MR-8/MR-7 Boundary	107.8																							
MOB - Trib off zone 95	110.5	-	H																					
MOB - Lane - Gateway	116.8	130.1	H			H		H	H	H	H			H	H	H			H	H		H	H	
MOB - Lane Creek	117.1	-	H			H		H		H	H				H	H			H	H		H	H	
Geomorphic Reach MR-7/MR-6 Boundary	122.7																							
MOB - 5th of July Creek	127.3	-			H			H			H			H					H	H		H	H	
MOB - Slough 8A	129.2	129.8	H		H			H	H		H			H		H			H	H		H	H	
MOB - Gateway - 4th of July	130.1	134.3	H		H			H	H		H			H		H			H	H		H	H	
MOB - Slough 9	131.4	133.5	H		H			H	H		H			H		H			H	H		H	H	
MOB - Sherman Creek	134.1	-																						
MOB - 4th of July Creek	134.3	-	H		H		H		H		H			H		H			H	H		H	H	
MOB - 4th of July - Slough 11	134.3	140.2	H		H		H		H		H			H		H			H	H		H	H	
MOB - Slough 11	138.6	-	H		H		H		H		H			H		H			H	H		H	H	
MOB - Gold Creek	140.1	-			H		H		H		H			H		H			H	H		H	H	
MOB - Slough11 - Indian	140.1	142.1			H		H		H		H			H		H			H	H		H	H	
MOB - Indian trib	141.8	-			H		H		H		H			H		H		H		H		H	H	
MOB - Indian - Slough 21	142.1	145.7			H		H		H		H			H		H		H		H		H	H	
MOB - Slough 21	145.1	145.6			H		H		H		H			H		H		H		H		H	H	
MOB - above Powerline	145.7	146			H		H		H		H			H		H		H		H		H	H	
MOB - abv Powerline - Portage	146	152.3			H		H		H		H			H		H		H		H		H	H	
MOB - Jack Long Creek	148.2	-			H		H		H		H			H		H		H		H		H	H	
Geomorphic Reach MR-6/MR-5 Boundary	148.4																							
MOB - Portage trib	152.3	-			H		H		H		H			H		H		H		H		H	H	
MOB - Portage - Impediment1	152.3	155.2			H		H		H		H			H		H		H		H	H	H	H	
Geomorphic Reach MR-5/MR-4 Boundary	153.9																							
MOB - Impediment1 - Cheechako	155.2	157.4			H		H		H		H			H		H		H		H	H	H	H	
MOB - Cheechako Creek	155.9	-			H		H		H		H			H		H		H		H		H	H	
MOB - Cheechako - Impediment2	157.4	160.2			H		H		H		H			H		H		H		H		H	H	
MOB - Impediment2 - Chinook	160.2	160.5			H		H		H		H			H		H		H		H		H	H	
MOB - Chinook Creek	160.4	-			H		H		H		H			H		H		H		H		H	H	
MOB - Chinook - Impediment3	160.5	164.8			H		H		H		H			H		H		H		H		H	H	
MOB - Devils Creek	164.8	-			H		H		H		H			H		H		H		H		H	H	
MOB - Impediment3 - Devil Stn	164.8	166.9			H		H		H		H			H		H		H		H		H	H	
Geomorphic Reach MR-4/MR-3 Boundary	166.1																							
MOB - Devil Stn - Fog	166.9	179.4			H		H		H		H			H				H						
Geomorphic Reach MR-3/MR-2 Boundary	169.6																							
MOB - Fog Creek	179.3	-			H		H		H		H			H				H						
MOB - Fog - Dam Site	179.4	186.8			H		H		H					H				H						
MOB - Tsusena Creek	184.5	-			H		H							H										
Geomorphic Reach MR-2/MR-1 Boundary	184.6																							
Geomorphic Reach MR-1/UR-6	187.1																							

Table A-2. Continued. Surveys on this page are from 2014.

Zone	PRM From	PRM To	9-17	9-18	9-20	9-21	9-24	9-25	9-30	10-01	10-02	10-07	10-08	10-09	10-14	10-15	10-16	10-17	10-28	10-29	10-30	11-05	12-04	12-16
MOB - Little Susitna River	-	-																						
MOB - Beyond Confluence	-	-											H				H			H				
MOB - Confluence - Yentna	3.5	32.4			H			H		H			H				H			H				
Geomorphic Reach LR-5/LR-4 Boundary	32.3																							
MOB - Yentna River	32.4	-			H			H		H			H				H			H				
MOB - Yentna - Deshka	32.4	45			H			H		H			H				H			H				
Geomorphic Reach LR-4/LR-3 Boundary	44.6																							
MOB - Deshka River	44.9	-			H			H		H			H				H			H				
MOB - Willow and Little Willow cr	52.2	55.6			H			H		H			H			H				H				
MOB - Kashwitna River	64.7	-		H	H			H		H			H			H				H				
MOB - Deshka - Kashwitna	45	64.7			H			H		H			H			H	H			H				
Geomorphic Reach LR-3/LR-2 Boundary	65.6																							
MOB - Caswell Creek	67.4	-				H		H		H			H			H				H				
MOB - Sheep Creek	70.1	-		H		H		H		H			H			H				H				
MOB - Goose Creek	76.9	-		H		H		H		H						H				H				
MOB - Kashwitna - Montana	64.7	80.7		H		H		H		H			H			H					H			
MOB - Montana Creek	80.9	-		H		H		H		H			H			H					H			
MOB - Montana - Sunshine	80.7	88.5		H		H		H		H			H			H					H			
MOB - Sunshine Creek	88.1	-		H		H		H		H			H			H					H			
MOB - Rabideux Creek	87.4	-		H		H		H		H			H			H					H			
Geomorphic Reach LR-2/LR-1 Boundary	87.9																							
MOB - Birch Creek	93.5	-		H		H		H		H						H					H			
MOB - Talkeetna River	101	-		H	H		H		H			H				H					H			
MOB - Chulitna River	101.7	-		H		H	H		H	H		H				H					H			
MOB - Sunshine - Talkeetna	88.5	102.3		H		H	H		H	H		H	H			H					H			
MOB - Talkeetna - Lane	102.3	116.8		H		H	H		H			H				H		H						
Geomorphic Reach LR-1/MR-8 Boundary	102.4																							
MOB - Whiskers Creek	104.8	-		H		H	H		H			H				H		H	H					
Geomorphic Reach MR-8/MR-7 Boundary	107.8																							
MOB - Trib off zone 95	110.5	-																						
MOB - Lane - Gateway	116.8	130.1		H		H	H		H			H		H		H		H	H					
MOB - Lane Creek	117.1	-		H		H	H		H			H				H		H	H					
Geomorphic Reach MR-7/MR-6 Boundary	122.7																							
MOB - 5th of July Creek	127.3	-																						
MOB - Slough 8A	129.2	129.8		H		H	H		H			H		H		H		H	H					
MOB - Gateway - 4th of July	130.1	134.3		H		H	H		H			H		H		H		H	H					
MOB - Slough 9	131.4	133.5		H		H	H		H			H		H		H		H	H					
MOB - Sherman Creek	134.1	-																						
MOB - 4th of July Creek	134.3	-		H		H	H		H			H		H		H			H					
MOB - 4th of July - Slough 11	134.3	140.2		H		H	H		H			H		H		H		H	H					
MOB - Slough 11	138.6	-		H		H	H		H			H		H		H		H	H					
MOB - Gold Creek	140.1	-	H		H		H		H			H		H	H									
MOB - Slough11 - Indian	140.1	142.1	H		H		H		H			H		H	H			H	H					
MOB - Indian trib	141.8	-	H		H		H		H			H		H	H			H	H					
MOB - Indian - Slough 21	142.1	145.7	H		H		H		H			H		H	H			H	H					
MOB - Slough 21	145.1	145.6	H		H		H		H			H		H	H			H	H					
MOB - above Powerline	145.7	146	H		H		H		H			H		H	H			H	H					
MOB - abv Powerline - Portage	146	152.3	H		H		H		H			H		H	H			H	H					
MOB - Jack Long Creek	148.2	-	H		H		H		H			H		H	H									
Geomorphic Reach MR-6/MR-5 Boundary	148.4																							
MOB - Portage trib	152.3	-	H		H		H		H			H		H	H			H	H					
MOB - Portage - Impediment1	152.3	155.2	H		H		H		H		H	H		H	H			H	H					
Geomorphic Reach MR-5/MR-4 Boundary	153.9																							
MOB - Impediment1 - Cheechako	155.2	157.4	H		H		H		H		H	H		H	H				H					
MOB - Cheechako Creek	155.9	-	H		H		H		H			H			H				H					
MOB - Cheechako - Impediment2	157.4	160.2	H		H		H		H			H			H				H					
MOB - Impediment2 - Chinook	160.2	160.5	H		H		H		H			H			H				H					
MOB - Chinook Creek	160.4	-	H		H		H		H						H				H					
MOB - Chinook - Impediment3	160.5	164.8	H		H		H		H			H			H				H				H	
MOB - Devils Creek	164.8	-	H		H		H		H						H				H		H			
MOB - Impediment3 - Devil Stn	164.8	166.9	H		H		H		H			H			H				H		H	H		
Geomorphic Reach MR-4/MR-3 Boundary	166.1																							
MOB - Devil Stn - Fog	166.9	179.4	H								H				H						H	H		
Geomorphic Reach MR-3/MR-2 Boundary	169.6																							
MOB - Fog Creek	179.3	-	H								H				H						H	H		
MOB - Fog - Dam Site	179.4	186.8	H								H				H						H	H	H	H
MOB - Tsusena Creek	184.5	-	H								H				H						H			
Geomorphic Reach MR-2/MR-1 Boundary	184.6																							
Geomorphic Reach MR-1/UR-6	187.1																							

Table A-2. Continued. Surveys on this page are from 2014 and 2015.

Zone	PRM From	PRM To	12-17	1-06	2-03	2-04	2-19	3-10	3-25	4-14	4-23	5-20	6-03	6-04	6-23	7-06
MOB - Little Susitna River	-	-														
MOB - Beyond Confluence	-	-														
MOB - Confluence - Yentna	3.5	32.4														
Geomorphic Reach LR-5/LR-4 Boundary	32.3															
MOB - Yentna River	32.4	-											H			
MOB - Yentna - Deshka	32.4	45											H			
Geomorphic Reach LR-4/LR-3 Boundary	44.6															
MOB - Deshka River	44.9	-											H			
MOB - Willow and Little Willow cr	52.2	55.6											H			
MOB - Kashwitna River	64.7	-				H							H			
MOB - Deshka - Kashwitna	45	64.7											H			
Geomorphic Reach LR-3/LR-2 Boundary	65.6															
MOB - Caswell Creek	67.4	-											H			
MOB - Sheep Creek	70.1	-				H							H			
MOB - Goose Creek	76.9	-											H			
MOB - Kashwitna - Montana	64.7	80.7	H			H				H			H			H
MOB - Montana Creek	80.9	-	H			H							H			H
MOB - Montana - Sunshine	80.7	88.5	H			H				H			H			H
MOB - Sunshine Creek	88.1	-	H										H			H
MOB - Rabideux Creek	87.4	-	H			H							H			H
Geomorphic Reach LR-2/LR-1 Boundary	87.9															
MOB - Birch Creek	93.5	-	H			H							H			H
MOB - Talkeetna River	101	-	H			H					H					H
MOB - Chulitna River	101.7	-	H			H							H			H
MOB - Sunshine - Talkeetna	88.5	102.3	H			H							H			H
MOB - Talkeetna - Lane	102.3	116.8	H			H							H			H
Geomorphic Reach LR-1/MR-8 Boundary	102.4															
MOB - Whiskers Creek	104.8	-	H			H							H			H
Geomorphic Reach MR-8/MR-7 Boundary	107.8															
MOB - Trib off zone 95	110.5	-														
MOB - Lane - Gateway	116.8	130.1	H			H		H	H				H			H
MOB - Lane Creek	117.1	-				H		H					H			H
Geomorphic Reach MR-7/MR-6 Boundary	122.7															
MOB - 5th of July Creek	127.3	-											H			
MOB - Slough 8A	129.2	129.8				H			H							H
MOB - Gateway - 4th of July	130.1	134.3	H			H		H	H				H			H
MOB - Slough 9	131.4	133.5	H													
MOB - Sherman Creek	134.1	-														
MOB - 4th of July Creek	134.3	-	H			H		H	H		H		H			H
MOB - 4th of July - Slough 11	134.3	140.2	H			H		H	H		H		H			H
MOB - Slough 11	138.6	-	H			H										
MOB - Gold Creek	140.1	-											H			H
MOB - Slough11 - Indian	140.1	142.1	H			H		H	H		H		H			H
MOB - Indian trib	141.8	-	H			H		H	H		H		H			H
MOB - Indian - Slough 21	142.1	145.7	H			H		H	H		H			H		
MOB - Slough 21	145.1	145.6														
MOB - above Powerline	145.7	146	H			H		H	H		H			H		
MOB - abv Powerline - Portage	146	152.3	H			H		H	H		H			H	H	
MOB - Jack Long Creek	148.2	-														
Geomorphic Reach MR-6/MR-5 Boundary	148.4															
MOB - Portage trib	152.3	-	H			H		H	H		H					
MOB - Portage - Impediment1	152.3	155.2	H			H		H	H		H			H	H	
Geomorphic Reach MR-5/MR-4 Boundary	153.9															
MOB - Impediment1 - Cheechako	155.2	157.4	H			H		H	H		H			H	H	
MOB - Cheechako Creek	155.9	-				H		H								
MOB - Cheechako - Impediment2	157.4	160.2	H			H		H	H		H			H	H	
MOB - Impediment2 - Chinook	160.2	160.5	H			H		H	H		H			H	H	
MOB - Chinook Creek	160.4	-				H		H								
MOB - Chinook - Impediment3	160.5	164.8	H			H		H	H		H			H	H	
MOB - Devils Creek	164.8	-				H								H		
MOB - Impediment3 - Devil Stn	164.8	166.9	H	H		H	H	H	H		H			H	H	
Geomorphic Reach MR-4/MR-3 Boundary	166.1															
MOB - Devil Stn - Fog	166.9	179.4	H	H		H	H	H	H	H	H			H	H	
Geomorphic Reach MR-3/MR-2 Boundary	169.6															
MOB - Fog Creek	179.3	-	H	H	H		H	H	H	H	H	H		H	H	
MOB - Fog - Dam Site	179.4	186.8	H	H	H		H	H	H	H	H	H		H	H	
MOB - Tsusena Creek	184.5	-	H	H	H		H	H	H	H	H	H		H	H	
Geomorphic Reach MR-2/MR-1 Boundary	184.6															
Geomorphic Reach MR-1/UR-6	187.1															

Table A-3. Tag summary for individual fish all seasons (Page 1 of 9).

All Seasons																											
Tag ID	Species	Tagging Segment	Release Location	Release Date	Last Live Date	Days Active	Total Detections	Fixed Station Events	# Fixed Stations Detected	# Aerial Surveys Detected	Distance Traveled (RM)	Linear Home Range (mi)	Mainstem Range (PRM)	Movments Past Dam Site	Tributaries & Lakes	Tributary Range (TRM)	Mainstem Aerial Detections	Ave Mainstem Survey Length (mi)	Mainstem Selection Ratio	Confluence Areal Detections	Ave Confluence Survey Length (mi)	Confluence Selection Ratio	Tributary Aerial Detections	Ave Tributary Survey Length (mi)	Tributary Selection Ratio	Lake Aerial Detections	% Aerial Detections in ZHI
9001	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 124.2	6/13/13	7/28/13	45	185	3	3	9	40.9	36.5	124.2 ↔ 152.3		Portage Creek	0 ↔ 8.4		27.7	0.00		3.6	0.00	9	25.8	2.22		0%
9002	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 124.2	6/13/13	7/25/14	407	578	3	2	30	272	114.2	49.9 ↔ 152.3		Portage Creek	0 ↔ 11.8	7	46.4	0.42	1	6.3	0.45	22	31.8	1.95		24%
9003	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 124.2	6/13/13	8/27/13	75	40			11	19.2	41.4	124.2 ↔ 152.6		Portage Creek	0 ↔ 13.3	1	30.9	0.22		4.3	0.00	10	39.1	1.73		9%
9004	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 124.2	6/13/13	10/28/14	502	54,466	23	1	55	149.4	58.9	84.5 ↔ 142.2		Indian River	0 ↔ 1.2	8	47.6	0.28	22	6.8	5.38	25	36.5	1.13		49%
9007	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 124.2	6/14/13	7/9/13	25	22	1	1	3	34.8	33.6	124.2 ↔ 152.3		Portage Creek	0 ↔ 5.5		37.4	0.00		5.0	0.00	3	18.2	3.33		0%
9010	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 124.2	6/14/13	7/13/13	28	377	5	4	4	67	37.2	116.8 ↔ 152.3		Portage Creek	0 ↔ 1.7	1	32.6	0.36	1	4.0	2.98	2	10.8	2.19		50%
9014	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 124.2	6/15/13	3/25/15	648	1,487	4	1	50	232.9	79.2	81.7 ↔ 152.3		Portage Creek	0 ↔ 8.6	13	43.4	0.54	5	6.2	1.45	32	40.6	1.42		36%
9015	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 124.2	6/16/13	8/10/13	55	6,039	5	1	5	13.7	10.5	113.9 ↔ 124.2		Lane Creek	0 ↔ 0.2	1	55.9	0.35	4	7.5	10.28		33.2	0.00		80%
9016	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 124.2	6/16/13	12/17/14	549	12,404	7	5	45	182.3	57.9	104.4 ↔ 152.3		Portage Creek	0 ↔ 10	7	37.0	0.36	3	5.3	1.06	35	42.7	1.55		22%
9020	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 124.2	6/16/13	8/12/13	57	1,530	5	1	11	39	36.9	124.2 ↔ 152.8		Portage Creek	0 ↔ 8.3	3	38.5	0.48	3	5.1	3.65	5	24.6	1.26		55%
9029	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 124.2	6/17/13	8/10/13	54	1,269	7	2	32	36.2	29.9	124.2 ↔ 152.4		Portage Creek	0 ↔ 1.7	2	17.5	0.12	9	2.6	3.56	21	12.6	1.71		34%
9115	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 152.3	7/23/13	8/27/13	35	116			23	20.3	17.3	135.5 ↔ 152.5		Portage Creek	0 ↔ 0.3	5	30.0	0.43	16	4.2	9.69	2	24.8	0.21		91%
9170	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 134.3	9/19/13	10/13/13	23	141	2	2	3	33.8	30	105.1 ↔ 135.1				3	53.8	1.93		7.9	0.00		41.9	0.00		100%
9227	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 134.3	9/25/13	10/22/13	27	8			3	0.1	0.1	134.2 ↔ 134.3					49.6	0.00	3	7.1	13.74		41.3	0.00		100%
9236	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 142	9/25/13	5/29/14	246	343	2	2	12	50.2	25.3	116.8 ↔ 142.1				11	53.9	1.36	1	7.4	0.90		18.7	0.00		100%
9091	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	7/18/13	7/23/13	5	16			3	1.2	0.6	184.1 ↔ 184.6		Tsusena Creek	0 ↔ 0.1		66.3	0.00	3	6.7	12.02		7.2	0.00		100%
9092	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	7/18/13	8/13/13	26	83			10	12.9	11.7	173.4 ↔ 184.7		Tsusena Creek	0 ↔ 0.4	3	60.3	0.37	6	6.0	7.40	1	7.8	0.96		90%
9093	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	7/18/13	9/23/13	67	152			20	3.3	1	184.4 ↔ 185.1		Tsusena Creek	0 ↔ 0.3	1	55.8	0.07	18	6.6	10.64	1	15.8	0.25		95%
9094	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	7/18/13	9/30/13	74	94			15	10.9	8.4	175.6 ↔ 184.6		Tsusena Creek	0 ↔ 0.1	7	58.9	0.69	8	7.5	6.23		20.8	0.00		100%
9095	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	7/18/13	10/15/13	89	178	1	1	17	20.7	17.5	167 ↔ 184.6		Tsusena Creek	0 ↔ 0.1	6	58.4	0.50	11	7.2	7.45		16.9	0.00		100%
9096	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	7/18/13	10/2/13	76	1,575	2	1	18	22.9	18.5	167 ↔ 185.1		Tsusena Creek	0 ↔ 0.4	6	57.6	0.47	8	7.0	5.15	4	16.9	1.07		72%
9097	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	7/18/13	8/20/13	33	109	1	1	17	52.4	49.3	135.9 ↔ 184.7		Tsusena Creek, Unnamed 184	0 ↔ 0.4	7	50.7	0.54	9	5.1	6.83	1	10.5	0.37		82%
9098	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	7/18/13	9/16/13	60	85			16	11	8.1	176.9 ↔ 184.9		Tsusena Creek	0 ↔ 0.1	10	60.0	0.88	6	7.3	4.36		17.7	0.00		100%
9124	Arctic Grayling	Middle/Lower US of DC	Susitna River PRM 179.4	7/24/13	6/28/14	339	179			24	10.6	4	179.2 ↔ 182.6		Fog Creek	0 ↔ 0.6	17	58.4	1.12	6	8.1	2.85	1	26.0	0.15		92%
9125	Arctic Grayling	Middle/Lower US of DC	Susitna River PRM 179.4	7/24/13	12/18/13	147	53			13	42.1	19.7	178.8 ↔ 197.8		Fog Creek	0 ↔ 0.7	7	55.9	0.84	4	8.1	3.28	2	22.9	0.58		77%
9126	Arctic Grayling	Middle/Lower US of DC	Susitna River PRM 179.4	7/24/13	5/12/14	292	153	1	1	18	39.7	37.4	142.1 ↔ 179.4		Fog Creek	0 ↔ 0.1	9	64.6	0.77	9	9.3	5.36		25.8	0.00		94%
9127	Arctic Grayling	Middle/Lower US of DC	Susitna River PRM 179.4	7/24/13	9/7/13	45	9,896	3	1	7	38.4	38.3	141.2 ↔ 179.4		Fog Creek	0 ↔ 0.1	4	47.2	0.96	3	7.4	4.63		25.1	0.00		100%
9128	Arctic Grayling	Middle/Lower US of DC	Susitna River PRM 179.4	7/24/13	12/18/13	147	78			14	9.6	7.6	172.9 ↔ 179.4		Fog Creek	0 ↔ 1.1	10	58.6	1.13		8.4	0.00	4	25.9	1.02		71%
9129	Arctic Grayling	Middle/Lower US of DC	Susitna River PRM 179.4	7/24/13	10/21/13	89	109			12	2.6	1.2	179 ↔ 180.1		Fog Creek	0 ↔ 0.1	2	61.3	0.26	10	8.5	9.46		26.4	0.00		92%
9130	Arctic Grayling	Middle/Lower US of DC	Susitna River PRM 179.4	7/24/13	12/18/13	147	110			16	8.4	3.8	178.6 ↔ 182.2		Fog Creek	0 ↔ 0.2	6	55.0	0.60	10	7.9	6.96		25.1	0.00		88%
9131	Arctic Grayling	Middle/Lower US of DC	Susitna River PRM 179.4	7/24/13	11/13/13	112	20,397	2	1	11	16	13.2	166.8 ↔ 179.4		Fog Creek	0 ↔ 0.6	6	62.8	0.87	4	8.7	4.17	1	28.8	0.32		91%
9164	Arctic Grayling	Middle/Lower US of DC	Susitna River PRM 175	8/21/13	8/21/13	0	1						175 ↔ 175														
9240	Arctic Grayling	Middle/Lower US of DC	Susitna River PRM 179.4	9/26/13	9/5/14	344	182			25	24.6	11.7	172.7 ↔ 184		Fog Creek	0 ↔ 0.4	7	54.5	0.48	17	8.4	7.58	1	30.9	0.12		84%
9241	Arctic Grayling	Middle/Lower US of DC	Susitna River PRM 179.4	9/26/13	12/2/13	67	13			4	3.9	3.9	179.4 ↔ 183.3				4	57.4	1.80		8.4	0.00		37.3	0.00		100%
9381	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	6/8/14	6/23/15	380	1,562	2	2	29	171.7	68	184.5 ↔ 247.3	2 ↕	Jay Creek, Tsusena Creek, Tyone River	0 ↔ 4.7	7	66.2	0.43	20	9.1	8.98	2	43.6	0.19		79%
9382	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	6/8/14	7/14/14	36	112	1	1	7	32.8	31.2	155.1 ↔ 186.2		Tsusena Creek	0 ↔ 0.1	4	34.7	0.95	3	5.4	4.62		17.8	0.00		100%
9406	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	6/9/14	7/10/14	31	116	3	3	6	55.9	54.7	130.2 ↔ 184.8		Tsusena Creek	0 ↔ 0.1	2	50.0	0.56	4	7.6	7.38		26.1	0.00		100%
9407	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	6/9/14	6/23/15	379	398			28	100.4	45.7	173.5 ↔ 219	2 ↕	Tsusena Creek, Unnamed 184	0 ↔ 0.1	14	60.4	0.86	14	8.4	6.18		34.9	0.00		96%
9408	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	6/9/14	6/23/15	379	779	3	3	32	153.2	73.6	184.5 ↔ 246.7	2 ↕	Tsusena Creek, Tyone River	0 ↔ 10.5	6	65.8	0.33	16	8.9	6.53	10	41.8	0.87		56%
9409	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	6/9/14	9/17/14	100	191	1	1	16	23.7	18	167 ↔ 184.7		Tsusena Creek	0 ↔ 0.3	3	51.6	0.34	12	8.4	8.48	1	34.9	0.17		88%
9410	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	6/9/14	7/10/14	31	57			6	3.2	1	183.8 ↔ 184.7		Tsusena Creek	0 ↔ 0.1	1	54.6	0.29	5	8.5	9.40		32.5	0.00		100%
9411	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	6/9/14	6/23/15	379	4,103	2	2	26	182.5	76	184.3 ↔ 241.3	2 ↕	Tsusena Creek	0 ↔ 19	11	69.2	0.75	10	9.3	5.08	5	44.6	0.53		77%
9081	Arctic Grayling	Upper River	Oshetna River TRM 18.3	7/17/13	2/17/14	215	184	1	1	3	32.3	32.2	235.1 ↔ 247.3		Oshetna River, Tyone River	0 ↔ 1.8		47.9	0.00		4.1	0.00	3	5.7	10.12		0%
9082	Arctic Grayling	Upper River	Oshetna River TRM 18.3	7/17/13	9/2/13	47	9			2	10.7	18.3			Oshetna River	0 ↔ 18.3		62.3	0.00		9.7	0.00	2	41.4	2.74		0%
9083	Arctic Grayling	Upper River	Oshetna River TRM 21.7	7/17/13	10/18/13	93	11	1	1		21.8	21.7	235.1 ↔ 235.2		Oshetna River	0 ↔ 21.7											
9084	Arctic Grayling	Upper River	Oshetna River TRM 21.7	7/17/13	10/7/13	82	44			6	13.9	21.7			Oshetna River	0 ↔ 21.7		62.3	0.00		9.7	0.00	6	36.0	3.00		0%
9085	Arctic Grayling	Upper River	Oshetna River TRM 21.7	7/17/13	6/29/14	347	599	2	1	5	44.2	32.8	235.1 ↔ 246.3		Oshetna River	0 ↔ 21.7	5	58.3	1.42		6.6	0.00		18.0	0.00		0%
9086	Arctic Grayling	Upper River	Oshetna River TRM 21.7	7/17/13	6/23/15	706	1,529	3	1	23	86.6	46.9	235.1 ↔ 247.3		Oshetna River, Tyone River	0 ↔ 13		75.8	0.00		9.2	0.00	23	44.5	2.91		0%
9087	Arctic Grayling	Upper River	Oshetna River TRM 21.7	7/17/13	7/17/13	0	1								Oshetna River	21.7 ↔ 21.7											
9088	Arctic Grayling	Upper River	Oshetna River TRM 21.7	7/17/13	7/17/13	0	1								Oshetna River	21.7 ↔ 21.7											

Table A-3. Tag summary for individual fish all seasons (Page 2 of 9).

All Seasons																											
Tag ID	Species	Tagging Segment	Release Location	Release Date	Last Live Date	Days Active	Total Detections	Fixed Station Events	# Fixed Stations Detected	# Aerial Surveys Detected	Distance Traveled (RM)	Linear Home Range (mi)	Mainstem Range (PRM)	Movments Past Dam Site	Tributaries & Lakes	Tributary Range (TRM)	Mainstem Aerial Detections	Ave Mainstem Survey Length (mi)	Mainstem Selection Ratio	Confluence Areal Detections	Ave Confluence Survey Length (mi)	Confluence Selection Ratio	Tributary Aerial Detections	Ave Tributary Survey Length (mi)	Tributary Selection Ratio	Lake Aerial Detections	% Aerial Detections in ZHI
9089	Arctic Grayling	Upper River	Susitna River PRM 189.5	7/18/13	9/2/13	46	32			9	8.4	7.8	183.7 ↔ 189.5	1 ↓	Tsusena Creek, Unnamed 184	0 ↔ 1.5	1	65.4	0.15	3	7.5	4.04	5	17.6	2.85		44%
9090	Arctic Grayling	Upper River	Susitna River PRM 189.5	7/18/13	7/26/13	8	7			2	9	9	180.5 ↔ 189.5	1 ↓			1	58.0	0.58	1	5.8	5.81		3.7	0.00		100%
9099	Arctic Grayling	Upper River	Watana Creek TRM 0.1	7/18/13	5/20/14	306	134			18	23.2	9.4	194.2 ↔ 198.6		Watana Creek	0 ↔ 5	9	58.4	0.81	8	8.6	4.87	1	27.3	0.19		100%
9100	Arctic Grayling	Upper River	Watana Creek TRM 0.1	7/18/13	12/2/13	137	101			14	15.2	12.7	184.8 ↔ 197.3	1 ↓	Watana Creek	0 ↔ 0.2	4	56.6	0.44	10	8.4	7.49		23.1	0.00		100%
9101	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	7/19/13	10/9/13	82	21,260	6	2	10	85.1	82.5	127.7 ↔ 209.2	1 ↓	Kosina Creek	0 ↔ 1	4	67.5	0.63	3	8.9	3.59	3	29.7	1.07		100%
9102	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	7/19/13	9/30/13	73	7,726	3	1	11	17.2	13.7	196.9 ↔ 209.6		Kosina Creek, Watana Creek	0 ↔ 0.9	1	66.4	0.14	3	9.3	2.99	7	26.5	2.46		100%
9103	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	7/19/13	7/31/13	12	10,250	2	1	1	0.4	0.2	209.2 ↔ 209.3		Kosina Creek	0 ↔ 0.1		51.2	0.00	1	6.7	8.96		2.1	0.00		100%
9104	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	7/19/13	9/9/13	52	11,863	7	1	6	11	1.6	207.7 ↔ 209.2		Kosina Creek	0 ↔ 0.1	5	67.9	1.26	1	9.2	1.85		25.6	0.00		100%
9105	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	7/19/13	8/20/13	32	13,534	5	1	5	2.8	1.1	209.1 ↔ 209.9		Kosina Creek	0 ↔ 0.3	1	80.3	0.26	3	8.9	6.97	1	13.8	1.49		100%
9106	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	7/19/13	8/26/13	38	4,619	1	1	3	24.7	24.6	184.7 ↔ 209.2	1 ↓	Kosina Creek	0 ↔ 0.1	2	62.3	1.05	1	9.7	3.37		26.3	0.00		100%
9107	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	7/19/13	6/29/14	345	40,263	12	1	25	80.4	31.8	184.9 ↔ 212.6	2 ↕	Kosina Creek	0 ↔ 4.1	17	58.7	1.10	4	8.6	1.76	4	27.4	0.55		88%
9108	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	7/19/13	9/24/13	67	5,767	2	2	17	54.5	50.5	160.3 ↔ 209.2	1 ↓	Chinook Creek, Kosina Creek	0 ↔ 1	5	14.4	0.39	10	1.9	5.91	2	2.7	0.84		71%
9109	Arctic Grayling	Upper River	Goose Creek TRM 0.3	7/22/13	7/31/13	9	698	1	1		23.9	0.3	209.2 ↔ 232.8		Goose Creek	0 ↔ 0.3											
9110	Arctic Grayling	Upper River	Goose Creek TRM 0.3	7/22/13	8/6/13	15	6			2	16	11	217.1 ↔ 232.8		Goose Creek	0 ↔ 0.3	2	106.7	1.26		9.8	0.00		17.7	0.00		100%
9111	Arctic Grayling	Upper River	Goose Creek TRM 0.1	7/22/13	8/13/13	22	13			3	31.6	31.3	201.3 ↔ 232.8		Goose Creek	0 ↔ 0.1	2	91.9	0.86	1	9.7	4.05		16.7	0.00		100%
9113	Arctic Grayling	Upper River	Clearwater Creek TRM 0.9	7/22/13	7/22/13	0	1								Clearwater Creek	0.9 ↔ 0.9											
9114	Arctic Grayling	Upper River	Clearwater Creek TRM 0.9	7/22/13	11/11/13	112	2			1	20.4	20.4	247.3 ↔ 266.6		Clearwater Creek, Tyone River	0 ↔ 0.9		34.8	0.00	1	2.1	24.38		14.3	0.00		0%
9132	Arctic Grayling	Upper River	Watana Creek TRM 0.1	7/25/13	8/6/13	12	9			2	0.6	0.3	196.9 ↔ 197.1		Watana Creek	0 ↔ 0.1		72.3	0.00	2	8.7	10.69		12.1	0.00		100%
9139	Arctic Grayling	Upper River	Susitna River PRM 189.5	7/27/13	8/26/13	30	55			7	1.2	0.6	189.2 ↔ 189.7		Deadman Creek	0 ↔ 0.1	1	54.5	0.20	6	7.3	9.13		16.0	0.00		100%
9140	Arctic Grayling	Upper River	Susitna River PRM 189.5	7/27/13	9/16/13	51	34	1	1	9	24.7	22.6	167 ↔ 189.5	1 ↓	Unnamed 184	0 ↔ 0.1	6	54.2	1.03	3	7.3	3.84		22.4	0.00		89%
9141	Arctic Grayling	Upper River	Susitna River PRM 189.5	7/27/13	1/28/14	185	97			17	9	4.9	184.9 ↔ 189.5	1 ↓	Deadman Creek	0 ↔ 0.3	9	59.2	0.84	7	8.6	4.53	1	26.4	0.21		100%
9142	Arctic Grayling	Upper River	Susitna River PRM 189.5	7/27/13	4/30/14	277	223			25	21	17.8	172.1 ↔ 189.5	1 ↓	Fog Creek, Tsusena Creek	0 ↔ 0.3	13	58.1	0.78	11	7.8	4.95	1	21.7	0.16		92%
9143	Arctic Grayling	Upper River	Susitna River PRM 189.5	7/27/13	5/20/14	297	137	1	1	20	42.9	29.9	185.7 ↔ 215.5	2 ↕	Deadman Creek	0 ↔ 0.1	11	60.6	0.83	9	8.6	4.83		22.6	0.00		100%
9163	Arctic Grayling	Upper River	Susitna River PRM 203.5	8/20/13	5/20/14	273	121			17	35.6	31.9	171.7 ↔ 203.5	1 ↓	Watana Creek	0 ↔ 0.1	13	57.4	1.25	4	8.6	2.57		27.9	0.00		100%
9171	Arctic Grayling	Upper River	Watana Creek TRM 0.1	9/18/13	5/20/14	244	124			14	24.2	22.1	176 ↔ 198	1 ↓	Watana Creek	0 ↔ 0.1	11	56.4	1.25	3	8.4	2.28		24.7	0.00		100%
9172	Arctic Grayling	Upper River	Watana Creek TRM 0.1	9/18/13	4/30/14	224	148			12	15.6	7.4	195.3 ↔ 202.6		Watana Creek	0 ↔ 0.1	10	54.4	1.26	2	8.1	1.69		20.0	0.00		100%
9173	Arctic Grayling	Upper River	Watana Creek TRM 0.1	9/18/13	1/6/15	475	6,467	2	1	19	40.6	15.7	194.4 ↔ 198.2		Watana Creek	0 ↔ 11.9	7	62.4	0.63	9	8.8	5.67	3	34.6	0.48		89%
9174	Arctic Grayling	Upper River	Watana Creek TRM 0.1	9/18/13	4/30/14	224	133			13	10.7	4.8	196.9 ↔ 201.6		Watana Creek	0 ↔ 0.1	10	55.0	1.18	3	8.2	2.36		21.0	0.00		100%
9175	Arctic Grayling	Upper River	Watana Creek TRM 0.1	9/18/13	6/2/14	257	262	1	1	13	37.4	24.2	196.9 ↔ 221.4		Watana Creek	0 ↔ 0.1	13	59.4	1.58		8.8	0.00		25.9	0.00		100%
9176	Arctic Grayling	Upper River	Watana Creek TRM 0.1	9/18/13	10/22/13	34	13			4	2.7	1.5	194.3 ↔ 196.9		Watana Creek	0 ↔ 0.1	4	50.8	1.65		8.2	0.00		24.8	0.00		100%
9177	Arctic Grayling	Upper River	Watana Creek TRM 0.1	9/18/13	11/12/13	55	26			3	2.1	1	196.9 ↔ 198.4		Watana Creek	0 ↔ 0.1	1	46.9	0.54	2	7.7	6.64		22.1	0.00		100%
9179	Arctic Grayling	Upper River	Watana Creek TRM 0.1	9/18/13	12/18/13	91	24			4	3	1.9	195.1 ↔ 196.9		Watana Creek	0 ↔ 0.1	3	50.8	1.23	1	8.7	2.40		23.6	0.00		100%
9181	Arctic Grayling	Upper River	Watana Creek TRM 0.1	9/18/13	10/7/13	19	12			3	3.1	2.1	196.9 ↔ 199.9		Watana Creek	0 ↔ 0.1	2	62.3	1.09	1	9.7	3.52		30.2	0.00		100%
9182	Arctic Grayling	Upper River	Watana Creek TRM 0.1	9/18/13	1/6/14	110	71			8	7.6	5.2	194 ↔ 199.1		Watana Creek	0 ↔ 0.1	7	44.8	1.40	1	7.5	1.20		19.5	0.00		100%
9184	Arctic Grayling	Upper River	Watana Creek TRM 0.1	9/18/13	6/16/14	271	219			15	12.6	5.9	196.2 ↔ 202		Watana Creek	0 ↔ 0.1	13	60.6	1.38	2	8.8	1.46		27.1	0.00		100%
9185	Arctic Grayling	Upper River	Susitna River PRM 187.7	9/19/13	11/13/13	55	19			5	6.1	6.1	181.6 ↔ 187.7	1 ↓			5	54.5	1.70		7.6	0.00		30.6	0.00		100%
9186	Arctic Grayling	Upper River	Susitna River PRM 208.3	9/19/13	11/11/13	53	2,026	3	2	4	42.3	40.3	208.1 ↔ 247.3		Tyone River	0 ↔ 1.1	3	55.4	1.21		7.8	0.00	1	26.2	0.85		50%
9187	Arctic Grayling	Upper River	Susitna River PRM 208.3	9/19/13	6/4/15	623	56,773	21	2	37	165.1	58.7	202.5 ↔ 247.3		Tyone River	0 ↔ 13.9	32	63.7	1.46	3	8.7	1.00	2	35.2	0.17		92%
9188	Arctic Grayling	Upper River	Susitna River PRM 208.3	9/19/13	3/18/14	180	13,898	4	1	11	16.6	9.1	200.1 ↔ 209.2				10	51.5	1.43	1	7.9	0.93		21.5	0.00		100%
9189	Arctic Grayling	Upper River	Susitna River PRM 206.7	9/19/13	6/11/14	265	1,355	4	2	5	93	47.7	204.3 ↔ 247.3		Tyone River	0 ↔ 4.7	2	69.3	0.61	1	9.6	2.19	2	26.2	1.61		60%
9194	Arctic Grayling	Upper River	Susitna River PRM 206.7	9/19/13	12/3/13	75	2,702	5	3	5	83.1	77.4	131.8 ↔ 209.2	1 ↓			4	50.8	1.33	1	7.5	2.25		26.1	0.00		100%
9210	Arctic Grayling	Upper River	Susitna River PRM 211	9/22/13	7/10/14	291	14,249	2	1	19	66.3	33.2	190.2 ↔ 217.2		Kosina Creek	0 ↔ 6.2	6	58.4	0.54	7	8.5	4.30	6	32.7	0.96		74%
9211	Arctic Grayling	Upper River	Susitna River PRM 211	9/22/13	10/21/13	29	37			4	0.3	0.2	211 ↔ 211.1		Jay Creek	0 ↔ 0.1		63.2	0.00	4	8.8	12.45		37.3	0.00		100%
9212	Arctic Grayling	Upper River	Goose Creek TRM 0.1	9/22/13	9/23/14	366	48,800	5	1	21	78.9	34.7	203.8 ↔ 235.2		Goose Creek, Oshetna River	0 ↔ 3	8	62.6	0.65	2	8.6	1.18	11	35.5	1.58		38%
9214	Arctic Grayling	Upper River	Goose Creek TRM 0.1	9/22/13	7/5/14	286	2,763	3	2	3	39.5	29.6	209.2 ↔ 235.2		Goose Creek	0 ↔ 3.6	1	56.8	0.66		8.4	0.00	2	47.3	1.59		0%
9215	Arctic Grayling	Upper River	Goose Creek TRM 0.1	9/22/13	11/11/13	50	2,497	2	1	3	13.8	12	232.4 ↔ 243.1		Goose Creek, Oshetna River	0 ↔ 1.2	2	53.1	1.06		7.2	0.00	1	24.1	1.17		33%
9216	Arctic Grayling	Upper River	Goose Creek TRM 0.1	9/22/13	11/11/13	50	984	2	1	4	8.6	5.6	232.2 ↔ 237.7		Goose Creek	0 ↔ 0.1	4	55.4	1.61		7.8	0.00		26.2	0.00		25%
9217	Arctic Grayling	Upper River	Goose Creek TRM 0.1	9/22/13	6/23/15	639	344			37	175.5	46.3	191.9 ↔ 232.8		Goose Creek	0 ↔ 5.4	20	68.2	0.93	4	8.9	1.42	13	40.3	1.02		65%
9225	Arctic Grayling	Upper River	Susitna River PRM 196.4	9/23/13	8/3/14	313	27,665	5	1	20	45.6	21.7	194.4 ↔ 209.2		Kosina Creek	0 ↔ 6.9	10	56.1	0.85	7	8.5	3.91	3	30.3	0.47		90%
9226	Arctic Grayling	Upper River	Susitna River PRM 196.4	9/23/13	9/23/13	0	3						196.4 ↔ 196.4														

Table A-3. Tag summary for individual fish all seasons (Page 3 of 9).

All Seasons																											
Tag ID	Species	Tagging Segment	Release Location	Release Date	Last Live Date	Days Active	Total Detections	Fixed Station Events	# Fixed Stations Detected	# Aerial Surveys Detected	Distance Traveled (RM)	Linear Home Range (mi)	Mainstem Range (PRM)	Movments Past Dam Site	Tributaries & Lakes	Tributary Range (TRM)	Mainstem Aerial Detections	Ave Mainstem Survey Length (mi)	Mainstem Selection Ratio	Confluence Areal Detections	Ave Confluence Survey Length (mi)	Confluence Selection Ratio	Tributary Aerial Detections	Ave Tributary Survey Length (mi)	Tributary Selection Ratio	Lake Aerial Detections	% Aerial Detections in ZHI
9300	Arctic Grayling	Upper River	Susitna River PRM 203.5	6/2/14	7/10/14	38	1,543	3	1	6	23.2	16.4	193.5 ↔ 203.5		Watana Creek	0 ↔ 6.4	2	55.6	0.63	1	8.5	2.05	3	40.2	1.30		100%
9301	Arctic Grayling	Upper River	Susitna River PRM 203.5	6/2/14	6/23/15	386	63,677	12	1	30	64.6	34.3	190.6 ↔ 224.5		Kosina Creek	0 ↔ 0.4	19	68.9	1.13	9	9.1	4.08	2	45.2	0.18		100%
9303	Arctic Grayling	Upper River	Susitna River PRM 203.5	6/2/14	6/23/15	386	924	2	2	34	134	54.3	184.2 ↔ 237.2	3 ↕	Tsusena Creek	0 ↔ 1.3	18	65.0	0.95	15	8.8	5.81	1	42.4	0.08		94%
9305	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/2/14	6/23/15	386	548	1	1	26	145.9	67.6	181.6 ↔ 246.1	3 ↕	Tsusena Creek	0 ↔ 3.1	15	70.1	1.02	4	9.4	2.04	7	44.6	0.75		69%
9306	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/2/14	2/3/15	246	344			22	14.4	10.4	188.9 ↔ 198.9		Deadman Creek	0 ↔ 0.4	9	59.2	0.75	12	8.8	6.73	1	40.4	0.12		100%
9311	Arctic Grayling	Upper River	Susitna River PRM 194.8	6/3/14	6/23/15	385	206	1	1	28	43	18.8	177 ↔ 194.8	3 ↕	Tsusena Creek	0 ↔ 1	18	60.7	1.12	4	8.5	1.79	6	37.0	0.62		75%
9312	Arctic Grayling	Upper River	Susitna River PRM 194.8	6/3/14	11/24/14	174	1,720	3	2	19	47	30	167 ↔ 197	1 ↓			10	47.7	0.98	9	7.7	5.49		33.7	0.00		100%
9313	Arctic Grayling	Upper River	Susitna River PRM 227.1	6/4/14	9/17/14	105	854	1	1	8	28.4	27.9	209.2 ↔ 227.3		Kosina Creek, Tsisi Creek	0 ↔ 3.6	4	61.8	0.98		9.2	0.00	4	50.1	1.21		63%
9314	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/4/14	10/2/14	120	145,660	16	1	16	4.8	0.9	208.4 ↔ 209.2		Kosina Creek	0 ↔ 0.1	3	54.8	0.36	13	8.7	9.89		42.2	0.00		100%
9315	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/4/14	6/28/14	24	9,150	4	2	5	33.6	33.1	176.2 ↔ 209.2	1 ↓	Kosina Creek	0 ↔ 0.1	2	53.0	0.66	3	8.2	6.46		26.7	0.00		100%
9317	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/4/14	12/4/14	183	43,775	10	3	17	35.5	26	184.3 ↔ 209.3	3 ↕	Kosina Creek, Tsusena Creek	0 ↔ 0.9	3	51.7	0.33	6	8.3	4.11	8	36.7	1.24		53%
9318	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/4/14	10/2/14	120	156,920	17	1	16	3.6	0.6	209 ↔ 209.4		Kosina Creek	0 ↔ 0.2	1	56.4	0.12	15	8.7	11.42		41.3	0.00		100%
9319	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/4/14	8/21/14	78	79,309	10	1	12	10.6	9	200.4 ↔ 209.3		Kosina Creek	0 ↔ 0.1	3	53.1	0.47	9	8.6	8.63		37.6	0.00		100%
9320	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/4/14	6/23/15	384	170,987	19	1	31	71.9	33.1	201.3 ↔ 234.3		Kosina Creek	0 ↔ 0.1	11	69.4	0.63	20	9.1	8.72		44.8	0.00		97%
9322	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/4/14	10/14/14	132	26,593	5	2	14	27.4	21.4	187.9 ↔ 209.2		Kosina Creek	0 ↔ 0.1	8	56.0	1.11	6	9.0	5.21		44.1	0.00		100%
9323	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/4/14	4/23/15	323	184,673	20	3	27	60.5	38	171.7 ↔ 209.4	2 ↕	Kosina Creek	0 ↔ 0.3	10	60.0	0.65	16	8.4	7.48	1	37.2	0.11		100%
9324	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/4/14	12/16/14	195	107,147	14	2	20	30.5	14.7	196.9 ↔ 211.1		Kosina Creek, Watana Creek	0 ↔ 0.3	4	57.7	0.38	15	8.8	9.36	1	43.8	0.13		100%
9325	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/4/14	6/23/15	384	81,625	16	3	30	176.7	58.5	184.6 ↔ 242.6	3 ↕	Kosina Creek, Tsusena Creek	0 ↔ 0.4	13	69.5	0.77	12	9.2	5.39	5	45.5	0.46		77%
9326	Arctic Grayling	Upper River	Susitna River PRM 203.5	6/4/14	2/3/15	244	829	2	1	17	23	9.2	196.6 ↔ 203.6		Watana Creek	0 ↔ 2.2	2	58.2	0.22	8	8.4	6.11	7	43.0	1.05		100%
9327	Arctic Grayling	Upper River	Susitna River PRM 203.5	6/4/14	6/29/14	25	123	3	3	3	62.2	61.8	142.1 ↔ 203.5	1 ↓	Tsusena Creek	0 ↔ 0.4	2	44.8	1.33		7.4	0.00	1	36.9	0.80		67%
9333	Arctic Grayling	Upper River	Susitna River PRM 206.7	6/5/14	6/4/15	364	15,090	10	1	26	44.1	20.2	194.2 ↔ 211		Kosina Creek	0 ↔ 3.4	15	68.6	1.02	4	9.2	2.03	7	43.3	0.75		100%
9334	Arctic Grayling	Upper River	Susitna River PRM 206.7	6/5/14	2/3/15	243	2,492	9	2	19	28	15.7	193.5 ↔ 209.2				15	60.7	1.50	4	8.8	2.78		46.0	0.00		100%
9335	Arctic Grayling	Upper River	Susitna River PRM 206.7	6/5/14	6/4/15	364	8,436	3	1	23	104.1	48.9	192.1 ↔ 234.2		Watana Creek	0 ↔ 6.8	14	71.9	1.07	4	9.2	2.40	5	45.5	0.60		96%
9337	Arctic Grayling	Upper River	Susitna River PRM 227.1	6/5/14	1/6/15	215	21,960	8	2	19	45.6	39	188.1 ↔ 227.1				14	59.0	1.38	5	8.8	3.30		42.6	0.00		100%
9349	Arctic Grayling	Upper River	Susitna River PRM 203.5	6/6/14	4/14/15	312	11,081	14	1	23	81.8	31.1	197 ↔ 228.1				20	66.0	1.52	3	9.0	1.68		40.7	0.00		100%
9355	Arctic Grayling	Upper River	Watana Creek TRM 0.1	6/7/14	7/10/14	33	81	1	1	6	9.4	8.7	189 ↔ 197.3		Deadman Creek, Watana Creek	0 ↔ 0.3	4	54.6	1.17	1	8.5	1.88	1	32.5	0.49		100%
9357	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/7/14	6/4/15	362	125,784	18	1	28	29.1	14.6	194.7 ↔ 209.2		Kosina Creek	0 ↔ 0.1	14	68.7	0.90	14	9.1	6.81		45.8	0.00		100%
9358	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/7/14	9/30/14	115	27,151	8	2	14	63.6	52.3	165.6 ↔ 209.3	1 ↓	Kosina Creek, Watana Creek	0 ↔ 8.5	3	46.6	0.43	6	7.6	5.26	5	38.9	0.85		100%
9359	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/7/14	6/28/14	21	7,092	4	2	5	24.6	21	190 ↔ 209.2		Kosina Creek	0 ↔ 1.8	3	53.0	0.99		8.2	0.00	2	26.7	1.32		100%
9360	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/7/14	7/17/14	40	29,066	7	1	6	3.4	1.3	208 ↔ 209.2		Kosina Creek	0 ↔ 0.1	1	55.6	0.31	5	8.5	10.23		40.2	0.00		100%
9361	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/7/14	9/17/14	102	71,603	13	3	14	30.8	26.6	182.9 ↔ 209.4	1 ↓	Kosina Creek	0 ↔ 0.1	6	55.3	0.83	8	8.9	6.88		43.0	0.00		100%
9362	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/7/14	6/23/15	381	35,090	10	2	26	70.6	23.4	196.9 ↔ 211.8		Kosina Creek, Watana Creek	0 ↔ 8.4	12	70.1	0.84	11	9.3	5.85	3	48.7	0.30		100%
9363	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/7/14	5/20/15	347	40,348	11	1	27	45.5	29.6	179.7 ↔ 209.2	1 ↓	Kosina Creek	0 ↔ 0.1	20	67.4	1.30	7	8.9	3.44		42.2	0.00		100%
9364	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/7/14	8/11/14	65	41,012	6	1	5	5	2.2	209.1 ↔ 211.2		Kosina Creek	0 ↔ 0.1		46.9	0.00	5	8.0	11.84		39.4	0.00		100%
9365	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/7/14	7/14/14	37	10,373	6	2	5	18	14	197 ↔ 209.2		Kosina Creek	0 ↔ 1.8	1	54.1	0.40	2	8.5	5.08	2	45.1	0.96		100%
9366	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/7/14	7/25/14	48	59,894	6	1	5	1.2	0.6	208.7 ↔ 209.2		Kosina Creek	0 ↔ 0.1	1	47.2	0.42	4	8.1	9.69		42.9	0.00		100%
9367	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/7/14	6/23/15	381	90,759	19	1	30	143.8	60.8	198.6 ↔ 247.3		Kosina Creek, Tyone River	0 ↔ 11.7	20	68.0	1.20	7	9.1	3.14	3	45.5	0.27		93%
9374	Arctic Grayling	Upper River	Susitna River PRM 196.4	6/7/14	8/3/14	57	157	1	1	8	20.8	19.7	179.2 ↔ 197	1 ↓	Fog Creek	0 ↔ 1.9	3	53.5	0.69	3	8.5	4.31	2	36.0	0.68		75%
9383	Arctic Grayling	Upper River	Watana Creek TRM 0.1	6/8/14	6/17/14	9	89	4	4	2	134	94.4	64.7 ↔ 196.9	1 ↓	Kashwitna River, Watana Creek	0 ↔ 1.7	1	69.6	0.60		7.4	0.00	1	7.0	6.00		100%
9386	Arctic Grayling	Upper River	Susitna River PRM 198.9	6/8/14	10/14/14	128	16,974	4	1	9	27.4	15.4	195.3 ↔ 198.9		Watana Creek	0 ↔ 11.8	2	56.6	0.44	2	8.8	2.82	5	46.4	1.34		67%
9391	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	7/4/14	25	380	3	3	5	105.9	105.9	83.6 ↔ 189.5	1 ↓			5	78.1	1.36		7.7	0.00		20.0	0.00		100%
9392	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	8/13/14	65	785	5	5	10	92.7	91.3	98.8 ↔ 189.6	1 ↓	Fog Creek	0 ↔ 0.5	7	55.6	1.16	2	8.5	2.17	1	28.1	0.33		90%
9393	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	6/28/14	19	63			4	2.2	1.2	189.3 ↔ 190.4		Deadman Creek	0 ↔ 0.1	1	47.8	0.39	3	7.6	7.42		20.0	0.00		100%
9394	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	6/28/14	19	28			5	7.4	7	182.7 ↔ 189.6	1 ↓	Deadman Creek	0 ↔ 0.1	2	53.0	0.66	3	8.2	6.46		26.7	0.00		100%
9395	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	10/20/14	132	383	1	1	15	6.9	3.1	187.2 ↔ 189.8		Deadman Creek	0 ↔ 0.5	2	55.9	0.25	8	8.9	6.28	5	39.7	0.88		93%
9396	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	7/15/14	36	125	1	1	6	24.3	23.2	167 ↔ 189.9	1 ↓	Deadman Creek	0 ↔ 0.3	3	54.6	0.87	2	8.5	3.76	1	32.5	0.49		100%
9397	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	8/22/14	74	448	1	1	12	23.9	22.6	167 ↔ 189.6	1 ↓			9	42.8	1.33	3	7.3	2.61		25.8	0.00		100%
9399	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	7/22/14	43	150	1	1	6	25.9	24.1	167 ↔ 189.7	1 ↓	Tsusena Creek	0 ↔ 1.4	1	48.8	0.30		8.2	0.00	5	30.6	2.38		17%
9400	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	10/2/14	115	91			17	22.9	16.1	173.5 ↔ 189.5	1 ↓	Deadman Creek	0 ↔ 0.1	10	50.7	1.06	7	8.0	4.68		32.5	0.00		100%
9401	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	8/21/14	73	54			10	2.3	1.1	188.7 ↔ 189.8				6	53.0	1.09	4	8.6	4.49		34.7	0.00		100%

Table A-3. Tag summary for individual fish all seasons (Page 4 of 9).

All Seasons																											
Tag ID	Species	Tagging Segment	Release Location	Release Date	Last Live Date	Days Active	Total Detections	Fixed Station Events	# Fixed Stations Detected	# Aerial Surveys Detected	Distance Traveled (RM)	Linear Home Range (mi)	Mainstem Range (PRM)	Movments Past Dam Site	Tributaries & Lakes	Tributary Range (TRM)	Mainstem Aerial Detections	Ave Mainstem Survey Length (mi)	Mainstem Selection Ratio	Confluence Areal Detections	Ave Confluence Survey Length (mi)	Confluence Selection Ratio	Tributary Aerial Detections	Ave Tributary Survey Length (mi)	Tributary Selection Ratio	Lake Aerial Detections	% Aerial Detections in ZHI
9402	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	7/17/14	38	181	2	2	8	41	39.1	152.1 ↔ 191.2	1 ↓			5	46.4	1.09	3	7.1	4.27		27.6	0.00		100%
9403	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	6/4/15	360	256	1	1	29	17.3	8.1	182.5 ↔ 190.1	1 ↓	Deadman Creek, Tsusena Creek	0 ↔ 0.3	11	61.9	0.68	16	8.8	6.94	2	39.6	0.19		90%
9404	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	8/6/14	58	112			12	10.4	8	181.8 ↔ 189.5	1 ↓	Deadman Creek	0 ↔ 0.3	4	48.9	0.61	7	8.1	6.49	1	32.7	0.23		100%
9047	Burbot	Middle/Lower DS of DC	Susitna River PRM 107	6/21/13	10/24/13	125	4,466	2	1	13	15.8	10.1	97 ↔ 107		Talkeetna River	0 ↔ 0.1	8	62.2	0.90	5	8.2	4.27		20.9	0.00		100%
9050	Burbot	Middle/Lower DS of DC	Susitna River PRM 107	6/21/13	3/19/14	271	2,316	3	1	18	30.7	16.2	102.2 ↔ 117.3		Chulitna River	0 ↔ 1.1	12	60.3	0.94	4	7.9	2.42	2	17.2	0.55		89%
9144	Burbot	Middle/Lower DS of DC	Susitna River PRM 124.2	8/8/13	8/12/13	4	7			1	0.3	0.3	123.9 ↔ 124.2				1	34.9	2.86		5.3	0.00		59.7	0.00		100%
9147	Burbot	Middle/Lower DS of DC	Susitna River PRM 33.9	8/16/13	9/13/13	28	7			2	0.4	0.2	33.7 ↔ 33.9				1	72.1	0.63	1	9.7	4.70		9.5	0.00		0%
9148	Burbot	Middle/Lower DS of DC	Susitna River PRM 33.9	8/16/13	9/20/13	35	23			4	3.6	3.1	31.3 ↔ 34.4				2	66.6	0.62	2	8.7	4.77		7.6	0.00		0%
9149	Burbot	Middle/Lower DS of DC	Susitna River PRM 33.8	8/16/13	8/30/13	14	11			2	0.8	0.8	33 ↔ 33.8				2	72.1	1.31		9.7	0.00		12.9	0.00		0%
9150	Burbot	Middle/Lower DS of DC	Fish Creek (Kroto) TRM 1.9	8/16/13	9/20/13	35	9			2	2.6	3.4			Fish Creek (Kroto), Yentna River	0 ↔ 1.5		70.6	0.00		9.5	0.00	2	9.4	9.57		0%
9245	Burbot	Middle/Lower DS of DC	Susitna River PRM 80.9	9/28/13	12/17/14	445	27			18	38.8	12.6	80.4 ↔ 93				14	73.6	1.23	4	9.1	2.84		33.4	0.00		100%
9246	Burbot	Middle/Lower DS of DC	Susitna River PRM 80.9	9/28/13	10/24/13	26	31			2	2.6	2.6	78.3 ↔ 80.9				2	77.5	1.30		8.4	0.00		15.3	0.00		0%
9561	Burbot	Middle/Lower US of DC	Susitna River PRM 186.8	9/8/14	12/16/14	99	54,680	2	1	4	2.7	1.1	186.1 ↔ 187.2	4 ↕			4	52.4	1.78		7.1	0.00		34.1	0.00		100%
9562	Burbot	Middle/Lower US of DC	Susitna River PRM 186.8	9/8/14	10/29/14	51	26,020	2	1	1	1.6	0.6	186.6 ↔ 187.2	3 ↕			1	74.0	2.16		10.7	0.00		75.0	0.00		100%
9563	Burbot	Middle/Lower US of DC	Susitna River PRM 183.8	9/8/14	6/23/15	288	120			14	22.8	13.1	174.1 ↔ 187.2	1 ↑			14	69.8	1.72		8.5	0.00		41.6	0.00		100%
9564	Burbot	Middle/Lower US of DC	Susitna River PRM 185.2	9/9/14	6/23/15	287	153			14	14.6	10.4	174.9 ↔ 185.3				14	69.7	1.68		8.4	0.00		39.2	0.00		100%
9565	Burbot	Middle/Lower US of DC	Susitna River PRM 186.8	9/9/14	4/23/15	226	1,994	4	1	12	8.2	1.7	185.5 ↔ 187.2	8 ↕			12	80.2	1.72		9.6	0.00		47.8	0.00		100%
9191	Burbot	Upper River	Susitna River PRM 206.7	9/19/13	9/23/13	4	4			1	0	0	206.7 ↔ 206.7				1	62.3	1.65		9.8	0.00		31.0	0.00		100%
9192	Burbot	Upper River	Susitna River PRM 206.7	9/19/13	4/9/14	202	69			10	3.9	1.6	206.2 ↔ 207.8				7	50.5	1.04	3	7.7	2.93		16.8	0.00		100%
9205	Burbot	Upper River	Watana Creek TRM 0.1	9/20/13	12/18/13	89	53			6	7	3.3	194.2 ↔ 197.4		Watana Creek	0 ↔ 0.1	4	39.8	1.06	2	6.9	3.09		16.9	0.00		100%
9206	Burbot	Upper River	Watana Creek TRM 0.1	9/21/13	6/24/14	276	41	2	1	13	9	2	195.1 ↔ 197		Watana Creek	0 ↔ 0.1	8	61.2	0.97	5	8.9	4.17		26.0	0.00		100%
9209	Burbot	Upper River	Susitna River PRM 215.2	9/21/13	5/20/14	241	162			13	11	8.1	212.3 ↔ 220.4				13	59.1	1.54		8.3	0.00		23.7	0.00		100%
9222	Burbot	Upper River	Watana Creek TRM 0.1	9/23/13	6/23/15	638	18			33	48.9	23.5	196.8 ↔ 220.2		Watana Creek	0 ↔ 0.1	21	72.1	1.09	12	9.3	4.84		41.8	0.00		100%
9224	Burbot	Upper River	Susitna River PRM 196.4	9/23/13	4/23/15	577	8	8	1	39	53.6	3.6	193.4 ↔ 197				28	63.3	1.24	11	8.9	3.46		37.1	0.00		100%
9304	Burbot	Upper River	Susitna River PRM 203.5	6/2/14	7/10/14	38	43			4	0.5	0.3	203.4 ↔ 203.7				1	59.1	0.47	3	9.4	8.86		42.1	0.00		100%
9309	Burbot	Upper River	Watana Creek TRM 0.1	6/3/14	5/20/15	351	201			28	20.7	6.6	191.9 ↔ 198.4		Watana Creek	0 ↔ 0.1	23	66.4	1.45	5	9.0	2.31		41.6	0.00		100%
9310	Burbot	Upper River	Watana Creek TRM 0.1	6/3/14	6/28/14	25	25			5	21.3	10.9	175.7 ↔ 196.9	1 ↓	Watana Creek	0 ↔ 0.1	4	49.7	1.32	1	7.4	2.21		24.6	0.00		100%
9329	Burbot	Upper River	Watana Creek TRM 0.1	6/5/14	9/5/14	92	300	3	1	11	17.2	3.4	193.7 ↔ 197		Watana Creek	0 ↔ 0.1	8	50.8	1.30	3	8.5	2.92		31.6	0.00		100%
9330	Burbot	Upper River	Watana Creek TRM 0.1	6/5/14	11/5/14	153	9,039	13	1	18	38.2	7.5	189.6 ↔ 197		Watana Creek	0 ↔ 0.1	15	53.4	1.62	3	8.6	2.01		41.7	0.00		100%
9331	Burbot	Upper River	Susitna River PRM 203.5	6/5/14	9/5/14	92	130			12	4.4	1.4	202.1 ↔ 203.5				9	48.1	1.43	3	8.4	2.75		35.5	0.00		100%
9332	Burbot	Upper River	Susitna River PRM 203.5	6/5/14	10/14/14	131	37,804	7	1	15	24.7	9.6	193.9 ↔ 203.5				9	56.1	1.11	6	8.9	4.66		39.2	0.00		100%
9336	Burbot	Upper River	Susitna River PRM 206.7	6/5/14	10/2/14	119	103	1	1	14	10.4	3.2	206 ↔ 209.2				13	53.5	1.80	1	8.8	0.84		41.1	0.00		100%
9343	Burbot	Upper River	Watana Creek TRM 0.1	6/6/14	6/23/15	382	76,029	13	1	29	28.7	4.8	195.8 ↔ 200.5		Watana Creek	0 ↔ 0.1	19	67.5	1.14	10	9.1	4.49		41.3	0.00		100%
9351	Burbot	Upper River	Susitna River PRM 203.5	6/6/14	4/14/15	312	48			23	10.7	3.3	202.6 ↔ 205.6		Unnamed 203.4	0 ↔ 0.3	11	66.2	0.86	11	9.1	6.28	1	43.7	0.12		100%
9352	Burbot	Upper River	Susitna River PRM 203.5	6/6/14	6/23/15	382	1			28	12.3	3.1	202 ↔ 205.1				12	69.9	0.77	16	9.4	7.65		46.0	0.00		100%
9373	Burbot	Upper River	Susitna River PRM 196.4	6/7/14	6/23/15	381	51,443	12	1	25	28.7	6.8	195.1 ↔ 201.8		Watana Creek	0 ↔ 0.1	22	67.7	1.54	3	9.1	1.57		41.8	0.00		100%
9378	Burbot	Upper River	Susitna River PRM 211	6/8/14	2/19/15	256	140	1	1	17	13.6	7	204.4 ↔ 211.4				2	67.1	0.22	15	8.9	12.37		48.9	0.00		100%
9379	Burbot	Upper River	Susitna River PRM 211	6/8/14	8/30/14	84	490	7	1	9	30.2	6.1	209.2 ↔ 215.3				4	61.0	0.81	5	8.8	7.02		41.2	0.00		100%
9511	Burbot	Upper River	Susitna River PRM 247.3	9/3/14	11/4/14	62	22			3	1.4	1.2	246.3 ↔ 247.3		Tyone River	0 ↔ 0.2	1	66.8	0.69	2	9.2	10.01		61.7	0.00		0%
9512	Burbot	Upper River	Susitna River PRM 247.3	9/3/14	6/23/15	293	219			16	11.6	3	245.7 ↔ 248.6		Tyone River	0 ↔ 0.1	7	82.8	0.75	9	9.6	8.35		50.2	0.00		0%
9514	Burbot	Upper River	Susitna River PRM 247.3	9/3/14	6/23/15	293	114			15	7.1	3	244.3 ↔ 247.3				15	83.3	1.70		9.6	0.00		49.1	0.00		0%
9515	Burbot	Upper River	Susitna River PRM 247.3	9/3/14	9/17/14	14	6			1	1.2	1.2	247.3 ↔ 247.3		Tyone River	0 ↔ 1.2		74.0	0.00		10.7	0.00	1	75.0	2.13		0%
9516	Burbot	Upper River	Susitna River PRM 247.3	9/3/14	9/3/14	0	1						247.3 ↔ 247.3														
9517	Burbot	Upper River	Susitna River PRM 232.4	9/3/14	6/23/15	293	42,161	3	1	17	35.9	16.8	220.3 ↔ 237.1				16	81.6	1.63	1	9.6	0.87		50.3	0.00		47%
9518	Burbot	Upper River	Susitna River PRM 232.4	9/3/14	3/25/15	203	11			12	20.8	18.8	230.8 ↔ 249.6				10	78.2	1.45	2	9.5	2.39		48.0	0.00		67%
9519	Burbot	Upper River	Susitna River PRM 211.1	9/4/14	6/23/15	292	414	2	1	17	17.3	8.1	209.2 ↔ 217.3				12	81.6	1.22	5	9.6	4.33		50.3	0.00		100%
9520	Burbot	Upper River	Susitna River PRM 210.3	9/4/14	6/23/15	292	70,885	5	1	17	18.3	12.3	198 ↔ 210.3				16	81.6	1.63	1	9.6	0.87		50.3	0.00		100%
9521	Burbot	Upper River	Susitna River PRM 210.3	9/4/14	10/2/14	28	954	3	1	3	6.8	1.9	209.2 ↔ 211.1				2	69.5	1.30	1	9.9	4.56		56.1	0.00		100%
9522	Burbot	Upper River	Susitna River PRM 210.3	9/4/14	11/4/14	61	93,843	5	1	5	3.3	1.9	208.6 ↔ 210.3		Kosina Creek	0 ↔ 0.2	2	67.3	0.82	3	9.5	8.71		60.8	0.00		100%
9523	Burbot	Upper River	Susitna River PRM 210.3	9/4/14	4/23/15	231	2,578	4	1	12	10.3	1.4	209.2 ↔ 210.6				11	82.8	1.56	1	9.7	1.21		48.4	0.00		100%

Table A-3. Tag summary for individual fish all seasons (Page 5 of 9).

All Seasons																										
Tag ID	Species	Tagging Segment	Release Location	Release Date	Last Live Date	Days Active	Total Detections	Fixed Station Events	# Fixed Stations Detected	# Aerial Surveys Detected	Distance Traveled (RM)	Linear Home Range (mi)	Mainstem Range (PRM)	Movments Past Dam Site	Tributaries & Lakes	Tributary Range (TRM)	Mainstem Aerial Detections	Ave Mainstem Survey Length (mi)	Mainstem Selection Ratio	Confluence Areal Detections	Ave Confluence Survey Length (mi)	Confluence Selection Ratio	Tributary Aerial Detections	Ave Tributary Survey Length (mi)	Tributary Selection Ratio	Lake Aerial Detections	% Aerial Detections in ZHI
9539	Burbot	Upper River	Watana Creek TRM 0.1	9/6/14	6/23/15	290	73,635	3	1	16	8.3	2.3	195 ↔ 197.2		Watana Creek	0 ↔ 0.1	2	82.8	0.22	14	9.6	12.98		50.2	0.00		100%
9541	Burbot	Upper River	Susitna River PRM 192.7	9/6/14	6/23/15	290	41			15	6.8	2.5	190.2 ↔ 192.7				15	80.5	1.70		9.4	0.00		47.0	0.00		100%
9546	Burbot	Upper River	Susitna River PRM 192.7	9/7/14	6/23/15	289	119			15	7.2	2.7	190.3 ↔ 193				15	77.5	1.71		9.1	0.00		45.6	0.00		100%
9547	Burbot	Upper River	Susitna River PRM 194.3	9/7/14	9/27/14	20	158	1	1		2.7	2.7	194.3 ↔ 197														
9548	Burbot	Upper River	Watana Creek TRM 0.1	9/7/14	5/20/15	255	3,968	2	1	11	7.1	1.9	195.2 ↔ 197		Watana Creek	0 ↔ 0.1	11	85.4	1.65		9.8	0.00		45.7	0.00		100%
9549	Burbot	Upper River	Watana Creek TRM 0.1	9/7/14	10/2/14	25	30,664	2	1	2	2.4	1.5	195.6 ↔ 197		Watana Creek	0 ↔ 0.1	1	73.1	0.97	1	10.2	6.98		58.5	0.00		100%
9554	Burbot	Upper River	Susitna River PRM 198.9	9/7/14	6/23/15	289	141			15	3.6	1	198.6 ↔ 199.6				15	83.0	1.76		9.8	0.00		53.6	0.00		100%
9031	Dolly Varden	Middle/Lower DS of DC	Susitna River PRM 124.2	6/17/13	11/15/13	151	60	2	1	10	71.4	46.4	99.6 ↔ 141.8		Indian River	0 ↔ 3.9	3	36.4	0.62		5.5	0.00	7	33.1	1.58		30%
9060	Dolly Varden	Middle/Lower DS of DC	Talkeetna River TRM 6.3	7/14/13	7/15/13	1	2			1	0.1	6.4			Talkeetna River	0 ↔ 6.4		28.2	0.00		3.3	0.00	1	3.7	9.51		0%
9064	Dolly Varden	Middle/Lower DS of DC	Talkeetna River TRM 6.3	7/14/13	7/19/14	370	117			14	16.7	6.7			Talkeetna River	0 ↔ 6.7		56.6	0.00		7.6	0.00	14	29.7	3.16		0%
9065	Dolly Varden	Middle/Lower DS of DC	Talkeetna River TRM 6.3	7/14/13	7/24/13	10	17			3	6.3	6.3			Talkeetna River	0 ↔ 6.2		47.1	0.00		6.0	0.00	3	17.2	4.09		0%
9066	Dolly Varden	Middle/Lower DS of DC	Talkeetna River TRM 5.9	7/14/13	7/24/13	10	11			3	6.9	6.9			Talkeetna River	0 ↔ 6.9		47.1	0.00		6.0	0.00	3	17.2	4.09		0%
9067	Dolly Varden	Middle/Lower DS of DC	Talkeetna River TRM 5.9	7/14/13	9/20/13	68	48			7	35.3	23.3	80.9 ↔ 93.6		Montana Creek, Talkeetna River	0 ↔ 10.5		56.2	0.00	4	7.4	6.01	3	14.3	2.33		50%
9072	Dolly Varden	Middle/Lower DS of DC	Talkeetna River TRM 5.9	7/14/13	6/4/14	325	150	1	1	8	53.9	23.4	83.4 ↔ 100.5		Talkeetna River	0 ↔ 6.3	4	62.3	0.70		7.5	0.00	4	17.1	2.55		50%
9145	Dolly Varden	Middle/Lower DS of DC	Susitna River PRM 124.2	8/8/13	8/15/13	6	69	1	1	2	19.1	19.1	105.1 ↔ 124.2				2	41.2	2.59		6.1	0.00		59.2	0.00		100%
9157	Dolly Varden	Middle/Lower DS of DC	Susitna River PRM 142	8/18/13	9/1/13	14	2,326	6	3	4	23.7	15.4	134.3 ↔ 149.7				4	32.6	2.65		4.8	0.00		48.8	0.00		100%
9005	Humpback Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/13/13	6/13/13	0	1						124.2 ↔ 124.2														
9042	Humpback Whitefish	Middle/Lower DS of DC	Susitna River PRM 107	6/21/13	6/28/13	7	1,035	1	1	1	33.4	33.4	73.6 ↔ 107				1	110.3	1.24		13.7	0.00		13.0	0.00		0%
9048	Humpback Whitefish	Middle/Lower DS of DC	Susitna River PRM 107	6/21/13	7/10/13	19	70	1	1	3	39.3	38.2	69.9 ↔ 107.4		Rabideux Creek	0 ↔ 0.7	1	84.1	0.40	1	8.3	4.08	1	8.7	3.86		100%
9112	Humpback Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	7/21/13	8/31/13	41	47	1	1	6	21.7	19.8	105.1 ↔ 124.2		Whiskers Creek	0 ↔ 0.7	5	43.3	1.69		6.2	0.00	1	38.2	0.38		100%
9116	Humpback Whitefish	Middle/Lower DS of DC	Susitna River PRM 152.3	7/23/13	8/5/13	13	23			2	4.2	4.2	148.1 ↔ 152.3				1	29.8	1.14	1	4.2	8.17		34.0	0.00		100%
9117	Humpback Whitefish	Middle/Lower DS of DC	Susitna River PRM 152.3	7/23/13	8/9/13	17	758	4	4	15	59	57.1	95.5 ↔ 152.6				2	27.1	0.23	13	3.7	11.03		16.6	0.00		100%
9138	Humpback Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	7/24/13	8/12/13	18	206	3	1	3	33.3	25.2	103.7 ↔ 128.9				3	57.7	1.57		7.9	0.00		25.0	0.00		100%
9530	Lake Trout	Upper River	Tsisi Lake 1	9/5/14	5/20/15	257	83			9	1.5				Tsisi Lake 1			79.4	0.00		9.3	0.00		50.0	0.00	9	0%
9531	Lake Trout	Upper River	Tsisi Lake 1	9/5/14	6/4/15	272	63			8	1.7				Tsisi Lake 1			85.2	0.00		9.7	0.00		52.4	0.00	8	0%
9532	Lake Trout	Upper River	Tsisi Lake 1	9/5/14	6/4/15	272	55			10	2.4				Tsisi Lake 1			80.8	0.00		9.4	0.00		52.9	0.00	10	0%
9533	Lake Trout	Upper River	Tsisi Lake 1	9/5/14	6/4/15	272	90			10	2.9				Tsisi Lake 1			80.8	0.00		9.4	0.00		52.9	0.00	10	0%
9534	Lake Trout	Upper River	Tsisi Lake 1	9/5/14	6/4/15	272	126			10	2.1				Tsisi Lake 1			80.8	0.00		9.4	0.00		52.9	0.00	10	0%
9535	Lake Trout	Upper River	Tsisi Lake 1	9/5/14	6/4/15	272	160			10	3				Tsisi Lake 1			80.8	0.00		9.4	0.00		52.9	0.00	10	0%
9536	Lake Trout	Upper River	Tsisi Lake 1	9/5/14	6/4/15	272	127			10	2.1				Tsisi Lake 1			80.8	0.00		9.4	0.00		52.9	0.00	10	0%
9537	Lake Trout	Upper River	Tsisi Lake 1	9/5/14	6/4/15	272	110			10	1.1				Tsisi Lake 1			80.8	0.00		9.4	0.00		52.9	0.00	10	0%
9538	Lake Trout	Upper River	Tsisi Lake 1	9/5/14	6/4/15	272	43			10	2.5				Tsisi Lake 1			80.8	0.00		9.4	0.00		52.9	0.00	10	0%
9566	Lake Trout	Upper River	Sally Lake	9/9/14	6/4/15	268	98			7	0.8				Sally Lake			83.2	0.00		9.5	0.00		59.9	0.00	7	100%
9567	Lake Trout	Upper River	Tsisi Lake 1	9/9/14	6/4/15	268	98			10	2.1				Tsisi Lake 1			80.8	0.00		9.4	0.00		52.9	0.00	10	0%
9568	Lake Trout	Upper River	Tsisi Lake 1	9/9/14	11/4/14	56	14			2	0.1				Tsisi Lake 1			64.1	0.00		8.9	0.00		67.9	0.00	2	0%
9006	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 124.2	6/14/13	6/14/13	0	1						124.2 ↔ 124.2														
9028	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 124.2	6/17/13	8/27/14	436	15,305	17	3	56	82.1	27	118.7 ↔ 145.6		Indian River	0 ↔ 0.1	47	55.3	1.48	9	7.4	2.13		35.1	0.00		100%
9032	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 124.2	6/17/13	9/7/13	82	52			13	35.9	32.5	92.7 ↔ 125.2				13	49.7	1.72		6.7	0.00		29.2	0.00		100%
9035	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 124.2	6/18/13	7/3/13	15	318	3	2	2	38.5	38.3	85.9 ↔ 124.2				2	100.2	1.24		12.3	0.00		12.0	0.00		100%
9036	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 124.2	6/18/13	8/16/13	59	179	1	1	7	39.9	34.2	94.1 ↔ 128.3				7	54.3	1.70		7.3	0.00		30.9	0.00		100%
9037	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 107	6/20/13	9/21/13	93	11,706	11	2	15	34.5	13.9	102.9 ↔ 116.8				11	56.3	1.23	4	7.1	3.52		30.9	0.00		100%
9038	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 107	6/20/13	7/15/13	25	14			4	2.8	1.5	106.8 ↔ 108.3				4	55.0	1.34		7.0	0.00		11.8	0.00		100%
9039	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 107	6/20/13	6/24/13	4	187	2	1	1	3.5	2.7	104.3 ↔ 107				1	47.4	1.38		6.1	0.00		11.8	0.00		100%
9043	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 107	6/21/13	7/3/13	12	5			1	2.4	2.4	104.6 ↔ 107				1	90.0	1.24		10.8	0.00		10.9	0.00		100%
9044	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 107	6/21/13	6/28/13	7	3,308	1	1	2	11.4	11.4	95.6 ↔ 107				2	78.9	1.28		9.9	0.00		12.4	0.00		100%
9045	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 107	6/21/13	6/28/13	6	440	1	1		1.9	1.9	105.1 ↔ 107														
9046	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 107	6/21/13	7/25/13	34	47	1	1	3	6.9	6.6	100.5↔ 107		Talkeetna River	0 ↔ 0.1	1	47.1	0.43	2	5.7	6.99		7.2	0.00		100%
9049	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 107	6/21/13	6/26/13	5	11	1	1		1.9	1.9	105.1 ↔ 107														
9068	Longnose Sucker	Middle/Lower DS of DC	Talkeetna River TRM 5.9	7/14/13	8/2/13	19	29			4	5.9	5.9			Talkeetna River	0 ↔ 5.9		38.9	0.00		5.1	0.00	4	25.7	2.71		0%
9070	Longnose Sucker	Middle/Lower DS of DC	Talkeetna River TRM 5.9	7/14/13	7/24/13	10	18			3	5.9	5.9			Talkeetna River	0 ↔ 5.9		47.1	0.00		6.0	0.00	3	17.2	4.09		0%

Table A-3. Tag summary for individual fish all seasons (Page 6 of 9).

All Seasons																												
Tag ID	Species	Tagging Segment	Release Location	Release Date	Last Live Date	Days Active	Total Detections	Fixed Station Events	# Fixed Stations Detected	# Aerial Surveys Detected	Distance Traveled (RM)	Linear Home Range (mi)	Mainstem Range (PRM)	Movments Past Dam Site	Tributaries & Lakes	Tributary Range (TRM)	Mainstem Aerial Detections	Ave Mainstem Survey Length (mi)	Mainstem Selection Ratio	Confluence Areal Detections	Ave Confluence Survey Length (mi)	Confluence Selection Ratio	Tributary Aerial Detections	Ave Tributary Survey Length (mi)	Tributary Selection Ratio	Lake Aerial Detections	% Aerial Detections in ZHI
9073	Longnose Sucker	Middle/Lower DS of DC	Talkeetna River TRM 5.9	7/14/13	7/25/13	11	9			2	52	52	54.4 ↔ 100.5		Talkeetna River	0 ↔ 5.5	1	47.0	0.61		5.6	0.00	1	5.0	5.81		0%
9074	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 107	7/15/13	7/19/13	4	96	1	1	1	1.9	1.9	105.1 ↔ 107				1	28.2	1.25		3.3	0.00		3.7	0.00		100%
9118	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 152.3	7/23/13	8/1/13	9	48	2	2	6	10.8	10.3	142.1 ↔ 152.4				3	42.5	0.82	3	5.6	6.19		21.2	0.00		100%
9134	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 142.3	7/25/13	8/28/13	34	1,000	6	1	10	13.8	5.3	137 ↔ 142.3				8	37.6	1.75	2	5.3	3.11		39.6	0.00		100%
9135	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 142.3	7/25/13	8/1/13	7	1,723	3	1	2	0.6	0.2	142.1 ↔ 142.3					29.8	0.00	2	3.8	12.32		12.7	0.00		100%
9137	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 142.3	7/26/13	8/10/13	15	1,638	3	2	4	27.4	27	115.3 ↔ 142.3				3	35.5	1.61	1	4.9	3.85		35.5	0.00		100%
9156	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 142	8/18/13	8/30/13	12	39	2	2	4	46.6	46.5	95.6 ↔ 142.1				3	45.8	1.43	1	6.4	3.42		35.0	0.00		100%
9158	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 142	8/18/13	1/28/14	163	258	4	1	12	18.3	14.5	127.9 ↔ 142.4				12	47.3	1.87		6.7	0.00		34.6	0.00		100%
9160	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 117.5	8/18/13	4/8/14	233	738	9	2	18	30.1	18.8	102.2 ↔ 118.2		Chulitna River	0 ↔ 2.8	5	57.3	0.49	8	7.9	5.67	5	36.0	0.78		78%
9161	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 113.8	8/19/13	12/18/13	121	130			11	11.9	10.2	104.9 ↔ 115.1				6	49.9	1.05	5	7.0	6.18		38.8	0.00		100%
9162	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 113.8	8/19/13	8/30/13	11	95	1	1	4	17.3	17.3	96.5 ↔ 113.8				4	45.8	1.90		6.4	0.00		35.0	0.00		100%
9165	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 142.3	8/29/13	9/4/13	6	126	2	2	2	25.5	25.5	116.8 ↔ 142.3				2	47.4	2.22		7.0	0.00		50.8	0.00		100%
9167	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 142	9/18/13	12/3/13	76	4,483	2	1	6	6.5	2.7	142 ↔ 144.7				6	48.5	1.83		7.0	0.00		33.0	0.00		100%
9119	Longnose Sucker	Upper River	Tyone River TRM 0.4	7/23/13	7/23/13	0	1								Tyone River	0.4 ↔ 0.4											
9120	Longnose Sucker	Upper River	Tyone River TRM 0.4	7/23/13	7/23/13	0	1								Tyone River	0.4 ↔ 0.4											
9121	Longnose Sucker	Upper River	Tyone River TRM 0.4	7/23/13	7/27/13	4	34	3	3	1	102	63.9	145.7 ↔ 247.3	1 ↓	Tyone River	0 ↔ 0.4	1	8.6	1.51		1.4	0.00		3.0	0.00		100%
9122	Longnose Sucker	Upper River	Tyone River TRM 0.4	7/23/13	8/9/13	17	38	1	1	2	190.8	120.2	56.9 ↔ 247.3	1 ↓	Tyone River	0 ↔ 0.4	2	65.2	1.21		7.1	0.00		6.7	0.00		100%
9123	Longnose Sucker	Upper River	Tyone River TRM 0.4	7/23/13	8/20/13	28	191	2	2	15	96.3	57.4	152.2 ↔ 247.3	1 ↓	Tyone River	0 ↔ 0.4	2	32.3	0.26	13	4.6	11.80		26.2	0.00		100%
9190	Longnose Sucker	Upper River	Susitna River PRM 206.7	9/19/13	9/30/13	11	16			2	2.6	2.6	204.1 ↔ 206.7					62.3	0.00	2	9.7	10.69		31.7	0.00		100%
9195	Longnose Sucker	Upper River	Susitna River PRM 206.7	9/19/13	2/19/15	518	46	9	1	35	42.1	18.2	191 ↔ 209.2				32	59.5	1.61	3	8.7	1.04		36.6	0.00		100%
9197	Longnose Sucker	Upper River	Susitna River PRM 206.7	9/19/13	11/12/13	54	27			4	1.6	1.2	205.5 ↔ 206.7				4	39.3	1.68		6.7	0.00		20.0	0.00		100%
9199	Longnose Sucker	Upper River	Susitna River PRM 206.7	9/19/13	11/4/14	411	3,489	10	1	29	42.8	14.7	206.1 ↔ 220.8				21	59.8	1.28	8	8.7	3.33		37.0	0.00		100%
9200	Longnose Sucker	Upper River	Susitna River PRM 198.1	9/20/13	7/17/14	300	7	2	1	17	18.4	5.9	192.2 ↔ 198.1				12	54.6	1.16	5	8.4	3.16		27.1	0.00		100%
9339	Longnose Sucker	Upper River	Watana Creek TRM 0.1	6/6/14	6/17/14	11	568	6	5	3	95.3	91.9	103.5 ↔ 196.9	1 ↓	Watana Creek	0 ↔ 0.1	3	71.1	1.43		8.3	0.00		22.5	0.00		100%
9340	Longnose Sucker	Upper River	Watana Creek TRM 0.1	6/6/14	8/7/14	62	7,129	8	5	6	109.2	104.1	96.2 ↔ 200.2	1 ↓	Watana Creek	0 ↔ 0.1	4	63.6	1.11	2	9.3	3.80		33.4	0.00		100%
9341	Longnose Sucker	Upper River	Watana Creek TRM 0.1	6/6/14	7/15/14	39	5,259	9	6	6	87.2	80.3	116.8 ↔ 197	1 ↓	Watana Creek	0 ↔ 0.1	5	54.6	1.46	1	8.5	1.88		32.5	0.00		100%
9342	Longnose Sucker	Upper River	Watana Creek TRM 0.1	6/6/14	7/9/14	33	19,869	5	1	6	1.4	0.4	196.8 ↔ 197.1		Watana Creek	0 ↔ 0.1		49.9	0.00	6	7.6	11.70		31.8	0.00		100%
9347	Longnose Sucker	Upper River	Watana Creek TRM 0.1	6/6/14	8/5/14	60	45,892	9	2	8	24	15.4	187.2 ↔ 202.1		Watana Creek	0 ↔ 0.5	2	45.5	0.49	5	7.8	7.07	1	35.2	0.31		100%
9348	Longnose Sucker	Upper River	Watana Creek TRM 0.1	6/6/14	8/7/14	62	258	6	6	9	119.2	98.9	80.2 ↔ 196.9	1 ↓	Watana Creek	0 ↔ 0.1	7	75.6	1.16	2	9.2	2.74		28.1	0.00		100%
9354	Longnose Sucker	Upper River	Susitna River PRM 203.5	6/6/14	12/16/14	193	178			19	13.4	4.4	199.1 ↔ 203.5				19	57.4	1.91		8.6	0.00		43.5	0.00		100%
9356	Longnose Sucker	Upper River	Susitna River PRM 203.5	6/7/14	8/18/14	72	39			9	6.2	3	203.5 ↔ 206.5				4	52.9	0.90	5	8.7	6.81		45.3	0.00		100%
9368	Longnose Sucker	Upper River	Susitna River PRM 206.7	6/7/14	11/12/14	158	10,409	3	3	16	47.1	39.7	167 ↔ 206.7	1 ↓			16	52.5	1.88		8.5	0.00		37.8	0.00		100%
9370	Longnose Sucker	Upper River	Susitna River PRM 206.7	6/7/14	11/4/14	150	10,617	3	1	15	23.7	13.2	193.5 ↔ 206.7				14	54.3	1.84	1	8.7	0.82		43.8	0.00		100%
9371	Longnose Sucker	Upper River	Susitna River PRM 206.7	6/7/14	10/2/14	117	20,281	9	1	17	29.2	15.3	191.6 ↔ 206.7		Watana Creek	0 ↔ 0.2	14	54.3	1.57	3	8.8	2.07		40.4	0.00		100%
9372	Longnose Sucker	Upper River	Susitna River PRM 206.7	6/7/14	11/4/14	150	181	1	1	18	14.7	10	197 ↔ 207				18	56.3	1.94		8.9	0.00		44.3	0.00		100%
9375	Longnose Sucker	Upper River	Susitna River PRM 196.4	6/7/14	10/14/14	129	1,475	7	1	13	36.6	8.4	192 ↔ 200.4				11	55.1	1.57	2	8.8	1.79		38.3	0.00		100%
9376	Longnose Sucker	Upper River	Susitna River PRM 196.4	6/7/14	10/2/14	117	308	2	1	16	24.3	7.9	189.1 ↔ 197				11	52.7	1.26	5	8.7	3.48		35.3	0.00		100%
9377	Longnose Sucker	Upper River	Susitna River PRM 196.4	6/7/14	12/3/14	179	84,383	10	1	19	21.5	5	195.7 ↔ 200.2		Watana Creek	0 ↔ 0.5	13	56.2	1.28	5	8.7	3.19	1	40.5	0.14		100%
9384	Longnose Sucker	Upper River	Watana Creek TRM 0.1	6/8/14	6/4/15	361	2,253	6	1	26	32	7.5	193.8 ↔ 201		Watana Creek	0 ↔ 0.3	20	67.0	1.35	5	8.9	2.53	1	41.6	0.11		100%
9388	Longnose Sucker	Upper River	Susitna River PRM 198.9	6/8/14	10/2/14	116	488	2	2	17	29.5	17.4	185.2 ↔ 202.6	1 ↓			17	54.3	1.90		8.8	0.00		40.2	0.00		100%
9500	Longnose Sucker	Upper River	Susitna River PRM 247.3	9/2/14	12/16/14	105	61			5	1.9	1.6	247.3 ↔ 248.8		Tyone River	0 ↔ 0.1	2	74.1	0.73	3	9.1	8.83		51.2	0.00		0%
9501	Longnose Sucker	Upper River	Susitna River PRM 247.3	9/2/14	6/23/15	294	167			12	34.6	16.7	235.2 ↔ 251.1		Tyone River	0 ↔ 0.8	9	87.5	1.23	2	9.7	2.47	1	45.9	0.26		0%
9502	Longnose Sucker	Upper River	Susitna River PRM 247.3	9/2/14	9/2/14	0	1						247.3 ↔ 247.3														
9503	Longnose Sucker	Upper River	Susitna River PRM 247.3	9/2/14	12/3/14	92	55			5	3.6	2.5	246.4 ↔ 248.9				4	69.1	1.55	1	8.9	3.02		55.9	0.00		0%
9504	Longnose Sucker	Upper River	Susitna River PRM 247.3	9/2/14	9/2/14	0	1						247.3 ↔ 247.3														
9507	Longnose Sucker	Upper River	Susitna River PRM 247	9/2/14	6/23/15	294	18			12	24.5	20.3	235.1 ↔ 250.8		Oshetna River	0 ↔ 4.6	9	87.5	1.23		9.7	0.00	3	45.9	0.78		0%
9508	Longnose Sucker	Upper River	Susitna River PRM 247	9/2/14	9/10/14	7	12	1	1		11.8	11.8	235.2 ↔ 247														
9509	Longnose Sucker	Upper River	Susitna River PRM 247	9/2/14	9/17/14	15	17			1	0.5	0.5	247 ↔ 247.3		Tyone River	0 ↔ 0.2		74.0	0.00	1	10.7	14.93		75.0	0.00		0%
9510	Longnose Sucker	Upper River	Susitna River PRM 247	9/2/14	11/4/14	63	8,600	2	2	4	41.5	41.2	206.1 ↔ 247		Jay Creek	0 ↔ 0.3	2	68.6	1.03	1	9.5	3.72	1	63.2	0.56		75%
9513	Longnose Sucker	Upper River	Susitna River PRM 247.3	9/3/14	9/3/14	0	1						247.3 ↔ 247.3														

Table A-3. Tag summary for individual fish all seasons (Page 7 of 9).

All Seasons																											
Tag ID	Species	Tagging Segment	Release Location	Release Date	Last Live Date	Days Active	Total Detections	Fixed Station Events	# Fixed Stations Detected	# Aerial Surveys Detected	Distance Traveled (RM)	Linear Home Range (mi)	Mainstem Range (PRM)	Movments Past Dam Site	Tributaries & Lakes	Tributary Range (TRM)	Mainstem Aerial Detections	Ave Mainstem Survey Length (mi)	Mainstem Selection Ratio	Confluence Areal Detections	Ave Confluence Survey Length (mi)	Confluence Selection Ratio	Tributary Aerial Detections	Ave Tributary Survey Length (mi)	Tributary Selection Ratio	Lake Aerial Detections	% Aerial Detections in ZHI
9525	Longnose Sucker	Upper River	Susitna River PRM 213.6	9/4/14	11/4/14	61	10,720	4	1	5	11.7	7.3	206.3 ↔ 213.6				1	67.3	0.41	4	9.5	11.61		60.8	0.00		100%
9540	Longnose Sucker	Upper River	Watana Creek TRM 0.1	9/6/14	11/5/14	60	9,786	2	2	3	10.9	10.8	186.3 ↔ 197	1 ↓	Watana Creek	0 ↔ 0.1	3	58.1	1.85		8.3	0.00		41.1	0.00		100%
9542	Longnose Sucker	Upper River	Susitna River PRM 192.7	9/6/14	10/14/14	38	7			2	2.6	1.6	192.7 ↔ 194.3				2	74.0	2.11		10.6	0.00		71.3	0.00		100%
9550	Longnose Sucker	Upper River	Susitna River PRM 198.9	9/7/14	9/22/14	15	240	5	5		41.6	41.6	157.3 ↔ 198.9	1 ↓													
9555	Longnose Sucker	Upper River	Susitna River PRM 198.9	9/7/14	6/23/15	289	9,166	1	1	14	19.2	13.4	194.5 ↔ 207.9				9	83.6	1.12	5	9.7	5.36		52.1	0.00		100%
9558	Longnose Sucker	Upper River	Susitna River PRM 198.9	9/7/14	6/23/15	289	44			15	9.8	2.7	196.7 ↔ 199.4				12	83.0	1.41	3	9.8	3.00		53.6	0.00		100%
9559	Longnose Sucker	Upper River	Susitna River PRM 198.9	9/7/14	9/17/14	10	397	2	2	1	36	31.9	167 ↔ 198.9	1 ↓			1	74.0	2.16		10.7	0.00		75.0	0.00		100%
9151	Northern Pike	Middle/Lower DS of DC	Fish Creek (Kroto) TRM 3.3	8/16/13	10/29/14	439	156			28	9.8	2.1			Fish Creek (Kroto)	3.2 ↔ 5.3		79.3	0.00		7.6	0.00	28	22.4	4.88		
9152	Northern Pike	Middle/Lower DS of DC	Fish Creek (Kroto) TRM 3.3	8/16/13	5/14/14	271	5			1	30.4	30.4			Fish Creek (Kroto), Yentna River	0 ↔ 25.5		65.8	0.00		8.7	0.00	1	10.4	8.16		
9153	Northern Pike	Middle/Lower DS of DC	Fish Creek (Kroto) TRM 3.3	8/16/13	1/7/14	144	34			3	2.1	1.3			Fish Creek (Kroto)	3.3↔ 4.6		72.6	0.00		6.6	0.00	3	6.7	12.82		
9154	Northern Pike	Middle/Lower DS of DC	Fish Creek (Kroto) TRM 3.3	8/16/13	8/16/13	0	1								Fish Creek (Kroto)	3.3 ↔ 3.3											
9155	Northern Pike	Middle/Lower DS of DC	Fish Creek (Kroto) TRM 3.3	8/16/13	4/8/14	235	8			7	1.9	0.9			Fish Creek (Kroto)	3.3 ↔ 4.2		69.7	0.00		6.4	0.00	7	11.4	7.65		
9008	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 124.2	6/14/13	9/2/14	445	36,805	22	5	47	171.4	41.4	106.3 ↔ 142.1		Indian River	0 ↔ 5.6	19	49.1	0.74	3	6.8	0.84	25	34.3	1.40		47%
9017	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 134.3	6/16/13	8/12/13	57	17,531	7	1	9	3.9	1.2	134.2 ↔ 134.6		Fourth of July Creek	0 ↔ 0.8	1	50.1	0.19	3	6.8	4.23	5	29.3	1.63		44%
9018	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 134.3	6/16/13	4/30/14	318	14,071	10	1	26	17.5	4.7	131.4 ↔ 134.9		Fourth of July Creek	0 ↔ 1.2	14	52.1	0.93	8	7.1	3.86	4	30.4	0.45		81%
9019	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 134.3	6/16/13	9/3/13	79	9,552	9	1	14	8.8	3.5	132.3 ↔ 134.9		Fourth of July Creek	0 ↔ 0.9	2	46.5	0.28	5	6.4	5.09	7	38.7	1.18		43%
9021	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 124.2	6/16/13	4/30/14	318	2,460	11	2	25	45.5	17	118.9 ↔ 134.4		Fourth of July Creek, Sherman Creek	0 ↔ 1.4	11	55.3	0.76	7	7.4	3.60	7	32.3	0.82		64%
9022	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 124.2	6/16/13	9/3/13	79	6,121	11	6	14	100.8	40.3	105.1 ↔ 142.3		Indian River	0 ↔ 3.1	1	33.1	0.18	3	4.9	3.68	10	46.2	1.30		29%
9026	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 124.2	6/17/13	7/30/13	43	2,175	3	2	7	17.6	14.4	123.9 ↔ 136.9		Fourth of July Creek	0 ↔ 1.4	4	48.0	0.90	1	6.1	1.77	2	21.8	1.00		71%
9040	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 124.2	6/20/13	4/8/14	292	407	3	2	20	62.8	28.8	122.8 ↔ 142.1		Indian River	0 ↔ 9.5	9	50.1	0.85	2	6.8	1.40	9	38.0	1.12		50%
9041	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 124.2	6/21/13	8/25/13	65	552	2	2	10	20.3	19.1	124.2 ↔ 142.1		Indian River	0 ↔ 1.2	3	45.3	0.57		6.2	0.00	7	34.1	1.76		30%
9051	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 124.2	6/24/13	5/21/14	331	706	1	1	23	45.5	33.1	102.9 ↔ 127.6		Chulitna River	0 ↔ 7.7	13	56.6	0.98	9	7.5	5.07	1	33.6	0.13		96%
9052	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 124.2	6/25/13	7/24/13	29	181	4	3	3	43.2	25.3	116.8 ↔ 142.1				2	34.6	1.28	1	4.4	5.07		27.5	0.00		100%
9054	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 134.3	7/9/13	9/21/14	439	3,356	6	1	58	37.2	6	129.7 ↔ 134.5		Fourth of July Creek	0 ↔ 1.2	18	51.6	0.58	17	7.3	3.88	23	37.6	1.02		59%
9055	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 134.3	7/9/13	9/8/13	61	4,725	10	1	11	68.1	64.6	70.9 ↔ 134.5		Fourth of July Creek, Sherman Creek	0 ↔ 0.7	1	41.4	0.19	7	5.7	9.43	3	37.5	0.62		50%
9056	Rainbow Trout	Middle/Lower DS of DC	Talkeetna River TRM 6.3	7/14/13	9/30/14	443	86			16	19.6	9.7	100.5 ↔ 103.5		Talkeetna River	0 ↔ 6.7	7	57.9	0.76		7.9	0.00	9	35.4	1.61		44%
9057	Rainbow Trout	Middle/Lower DS of DC	Talkeetna River TRM 6.3	7/14/13	8/23/13	40	13			3	5.1	6.3			Talkeetna River	0 ↔ 6.3		52.3	0.00		6.6	0.00	3	6.9	9.53		0%
9058	Rainbow Trout	Middle/Lower DS of DC	Talkeetna River TRM 6.3	7/14/13	8/2/13	19	16			3	0.6	6.8			Talkeetna River	0 ↔ 6.8		29.9	0.00		4.2	0.00	3	31.6	2.08		0%
9059	Rainbow Trout	Middle/Lower DS of DC	Talkeetna River TRM 6.3	7/14/13	8/9/13	26	24			3	6.6	6.4	100.5 ↔ 100.6		Talkeetna River	0 ↔ 6.4		57.4	0.00	1	7.2	3.30	2	6.9	6.88		33%
9061	Rainbow Trout	Middle/Lower DS of DC	Talkeetna River TRM 6.3	7/14/13	8/19/14	401	225			28	61.9	25.1	90.2 ↔ 102.2		Birch Creek, Chulitna River, Talkeetna River	0 ↔ 6.3	13	75.8	0.69	5	9.3	2.17	10	27.8	1.45		68%
9062	Rainbow Trout	Middle/Lower DS of DC	Talkeetna River TRM 6.3	7/14/13	8/2/13	19	23			4	0.8	6.3			Talkeetna River	0 ↔ 6.3		38.9	0.00		5.1	0.00	4	25.7	2.71		0%
9063	Rainbow Trout	Middle/Lower DS of DC	Talkeetna River TRM 6.3	7/14/13	8/30/13	47	20			4	50	6.3	57.6 ↔ 100.5		Talkeetna River	0 ↔ 6.3	1	51.8	0.36		6.7	0.00	3	15.5	3.58		0%
9071	Rainbow Trout	Middle/Lower DS of DC	Talkeetna River TRM 5.9	7/14/13	7/24/13	10	6			1	8	13.9			Talkeetna River	0 ↔ 13.9		47.4	0.00		6.9	0.00	1	40.2	2.35		0%
9075	Rainbow Trout	Middle/Lower DS of DC	Montana Creek TRM 2.3	7/15/13	8/23/13	39	1,089	3	1	5	39.7	3.3	50.9 ↔ 80.9		Montana Creek	0 ↔ 3.3	1	68.0	0.25		8.7	0.00	4	8.6	7.97		0%
9076	Rainbow Trout	Middle/Lower DS of DC	Montana Creek TRM 2.3	7/15/13	8/1/13	17	3,199	3	1	3	7.8	2.4			Montana Creek	0 ↔ 2.4		66.3	0.00		8.1	0.00	3	8.0	10.26		0%
9077	Rainbow Trout	Middle/Lower DS of DC	Montana Creek TRM 2.3	7/15/13	8/9/13	25	11,744	3	1	3	7.5	2.3			Montana Creek	0 ↔ 2.3		70.4	0.00		9.1	0.00	3	9.1	9.74		0%
9078	Rainbow Trout	Middle/Lower DS of DC	Montana Creek TRM 2.3	7/15/13	8/9/13	25	2,020	2	1	2	7.8	3.5			Montana Creek	0 ↔ 3.5		72.1	0.00		9.2	0.00	2	8.6	10.50		0%
9079	Rainbow Trout	Middle/Lower DS of DC	Montana Creek TRM 2.3	7/15/13	2/4/15	569	7,531	4	2	47	36.1	7.4	80.5 ↔ 85.3		Montana Creek	0 ↔ 2.6	16	81.8	0.49	3	9.6	0.79	28	27.2	2.60		36%
9080	Rainbow Trout	Middle/Lower DS of DC	Montana Creek TRM 2.3	7/15/13	8/17/13	33	13,232	5	1	4	16.8	3			Montana Creek	0 ↔ 3		69.3	0.00		8.8	0.00	4	8.4	10.32		0%
9133	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 142	7/25/13	8/31/13	37	5,039	13	3	12	17.4	11.9	130.2 ↔ 142.1				8	36.4	1.50	4	5.2	5.23		40.2	0.00		100%
9146	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 124.2	8/16/13	8/29/13	13	84	2	2	4	25.3	22.2	105.1 ↔ 127.3				1	38.1	0.59	3	5.5	12.37		46.8	0.00		100%
9159	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 142	8/18/13	8/31/13	13	76	1	1	4	37.3	36.9	105.2 ↔ 142.1				3	41.2	1.68	1	5.9	3.89		45.1	0.00		100%
9166	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 142.3	8/29/13	11/3/13	66	518	5	1	7	9.8	4.6	141.8 ↔ 146.2		Indian River	0 ↔ 0.2	5	52.9	1.47	2	7.9	3.94		47.8	0.00		86%
9168	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 142	9/18/13	9/24/13	6	989	2	2	1	9.3	9.2	132.9 ↔ 142.1				1	47.4	2.11		6.9	0.00		45.5	0.00		100%
9169	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 142	9/18/13	9/24/13	6	231	2	2	1	10.7	10.6	131.5 ↔ 142.1				1	47.4	2.11		6.9	0.00		45.5	0.00		100%
9228	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 134.3	9/25/13	7/14/14	292	152			20	13.5	6.1	131.8 ↔ 137.6		Fourth of July Creek	0 ↔ 0.3	10	51.9	0.79	9	7.2	5.11	1	23.1	0.18		95%
9237	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 142	9/25/13	4/23/15	575	1,093	7	1	50	36.7	12.6	135.1 ↔ 142.1		Indian River	0 ↔ 5.6	16	46.1	0.60	4	6.5	1.07	30	33.5	1.54		40%
9238	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 142	9/25/13	6/3/15	616	10,471	10	1	48	155.1	103.1	40.9 ↔ 142.3		Fourth of July Creek, Indian River	0 ↔ 1.4	24	49.2	0.97	8	7.0	2.27	16	39.4	0.81		64%
9239	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 142	9/25/13	7/6/15	649	6,299	6	1	37	66.6	21.2	134 ↔ 142.1		Fourth of July Creek, Indian River	0 ↔ 13	13	50.8	0.66	7	7.3	2.47	17	37.6	1.17		49%
9242	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 80.9	9/27/13	2/4/15	495	462			35	41.7	15.6	79.2 ↔ 88.8		Montana Creek	0 ↔ 6	15	82.6	0.64	19	9.4	7.20	1	32.2	0.11		95%

Table A-3. Tag summary for individual fish all seasons (Page 8 of 9).

All Seasons																											
Tag ID	Species	Tagging Segment	Release Location	Release Date	Last Live Date	Days Active	Total Detections	Fixed Station Events	# Fixed Stations Detected	# Aerial Surveys Detected	Distance Traveled (RM)	Linear Home Range (mi)	Mainstem Range (PRM)	Movments Past Dam Site	Tributaries & Lakes	Tributary Range (TRM)	Mainstem Aerial Detections	Ave Mainstem Survey Length (mi)	Mainstem Selection Ratio	Confluence Areal Detections	Ave Confluence Survey Length (mi)	Confluence Selection Ratio	Tributary Aerial Detections	Ave Tributary Survey Length (mi)	Tributary Selection Ratio	Lake Aerial Detections	% Aerial Detections in ZHI
9243	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 80.9	9/27/13	7/6/15	647	1			32	94.6	35.4	80.6 ↔ 106.3		Montana Creek	0 ↔ 9.7	12	80.7	0.59	3	9.4	1.27	17	36.8	1.83		45%
9244	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 80.9	9/28/13	8/19/14	325	44			9	33.2	31	53.6 ↔ 80.9		Willow Creek	0 ↔ 3.7	5	77.2	0.79	1	8.7	1.40	3	24.1	1.52		0%
9247	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 80.9	9/28/13	10/29/14	396	295			29	78	30.9	52.7 ↔ 80.9		Goose Creek (LR), Kashwitna River	0 ↔ 1.4	17	82.0	0.92	7	9.2	3.36	5	37.5	0.59		0%
9248	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 80.9	9/28/13	8/22/14	328	229			12	26.1	11.8	71.6 ↔ 81		Montana Creek	0 ↔ 2.4	10	79.4	1.22	1	9.1	1.06	1	27.3	0.35		50%
9249	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 80.9	9/28/13	12/17/14	445	351			29	18	5.8	80 ↔ 83.1		Montana Creek	0 ↔ 2.7	14	80.3	0.75	8	9.3	3.73	7	35.8	0.84		74%
9250	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 80.9	9/28/13	8/28/14	334	200			14	22.1	13.4	80.5 ↔ 88.8		Montana Creek	0 ↔ 5.1	8	70.8	0.88	4	8.8	3.57	2	29.9	0.52		85%
9009	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/14/13	6/26/13	12	15	1	1	1	21.3	20.2	105.1 ↔ 125.3				1	47.4	1.38		6.1	0.00		11.8	0.00		100%
9011	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/14/13	5/24/14	343	2,172	5	3	13	81.2	30	100.5 ↔ 124.2		Talkeetna River	0 ↔ 6.3	6	54.7	0.70	4	6.9	3.73	3	21.5	0.89		77%
9012	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/14/13	9/20/13	98	8			3	69.4	69.4	54.8 ↔ 124.2				3	66.8	1.23		8.6	0.00		6.9	0.00		100%
9013	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/15/13	12/3/13	171	372	5	4	22	83.2	43.7	124.2 ↔ 152.3		Portage Creek	0 ↔ 15.6	9	39.8	0.88	1	5.8	0.67	12	40.5	1.16		45%
9023	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/16/13	9/8/13	84	22	2	2	2	92.2	92.2	32.4 ↔ 124.2		Yentna River	0 ↔ 0.4	1	77.1	0.61		9.3	0.00	1	7.5	6.26		100%
9024	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/16/13	10/2/13	108	223	1	1	14	82.2	61.7	67.2 ↔ 128.9				12	51.4	1.64	2	7.3	1.92		39.4	0.00		100%
9025	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/16/13	2/18/14	247	4,345	8	4	22	85.5	42	123.3 ↔ 152.3		Indian River, Portage Creek	0 ↔ 12.9	10	49.1	0.80	3	6.8	1.74	9	30.7	1.15		59%
9027	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/17/13	9/13/13	88	84	2	1	14	47.1	33.1	102.2 ↔ 134.3		Chulitna River, Fourth of July Creek	0 ↔ 0.7	10	42.2	1.49	2	5.9	2.14	2	39.9	0.31		93%
9030	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/17/13	10/9/13	114	3,455	4	1	13	36.4	27	97.2 ↔ 124.2				12	49.4	1.60	1	6.9	0.96		29.5	0.00		100%
9033	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/18/13	9/3/13	77	7,204	7	5	18	57.1	37.2	105.1 ↔ 142.1		Gold Creek	0 ↔ 0.2	7	39.0	0.82	11	5.4	9.28		37.3	0.00		89%
9034	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/18/13	9/20/13	94	485	4	4	19	50.3	34	105.1 ↔ 139.1				19	49.3	1.89		6.8	0.00		37.2	0.00		100%
9053	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	7/7/13	8/17/14	406	114	1	1	25	177.1	75.3	49.7 ↔ 125				24	62.2	1.56	1	7.4	0.55		31.3	0.00		100%
9069	Round Whitefish	Middle/Lower DS of DC	Talkeetna River TRM 5.9	7/14/13	8/16/13	33	12			3	53.8	9.6	60 ↔ 100.5		Talkeetna River	0 ↔ 9.6	1	46.6	0.63		6.6	0.00	2	35.5	1.67		0%
9136	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 142.3	7/26/13	7/31/13	5	975	3	2	3	8.6	8	134.3 ↔ 142.3				3	31.5	1.56		4.0	0.00		13.6	0.00		100%
9229	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 134.3	9/25/13	4/8/14	195	245	1	1	10	77.2	43.2	98.9 ↔ 142.1				8	65.9	1.14	2	8.4	2.24		19.5	0.00		100%
9230	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 134.3	9/25/13	2/19/14	147	31			7	56.8	54.8	81.5 ↔ 136.3				6	57.8	1.13	1	7.6	1.42		10.5	0.00		100%
9231	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 134.3	9/25/13	5/30/14	247	598	1	1	11	58.9	29.9	104.4 ↔ 134.3				8	64.4	0.98	3	8.1	2.92		14.0	0.00		100%
9232	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 134.3	9/25/13	7/2/14	280	263	1	1	12	50.2	38.8	98.2 ↔ 134.3		Chulitna River	0 ↔ 2.7	5	69.3	0.58	6	8.5	5.69	1	18.8	0.43		92%
9233	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 134.3	9/25/13	4/30/14	217	118	1	1	9	25	11.9	130.9 ↔ 142.1		Fourth of July Creek	0 ↔ 0.7	7	57.5	1.15	1	7.7	1.22	1	19.4	0.48		89%
9234	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 134.3	9/25/13	12/16/13	82	34			6	4.6	1.7	132.7 ↔ 134.3		Fourth of July Creek	0 ↔ 0.1	3	48.5	0.83	3	6.9	5.90		25.4	0.00		83%
9235	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 142	9/25/13	4/23/15	575	3,971	9	1	48	31.6	5.7	137.2 ↔ 142.9				38	49.5	1.40	10	7.1	2.59		31.1	0.00		100%
9178	Round Whitefish	Upper River	Watana Creek TRM 0.1	9/18/13	12/18/13	91	45			7	8.1	7.2	189.8 ↔ 196.9		Watana Creek		4	43.0	0.92	3	7.3	4.10		19.1	0.00		100%
9180	Round Whitefish	Upper River	Watana Creek TRM 0.1	9/18/13	10/7/13	19	25			3	1.8	1.6	196.7 ↔ 198.2		Watana Creek		1	62.3	0.55	2	9.7	7.04		30.2	0.00		100%
9183	Round Whitefish	Upper River	Watana Creek TRM 0.1	9/18/13	12/2/13	75	7,469	1	1	3	19.3	11.9	196.9 ↔ 209.2		Watana Creek		3	54.6	1.71		9.2	0.00		29.7	0.00		100%
9193	Round Whitefish	Upper River	Susitna River PRM 206.7	9/19/13	9/24/14	370	208	1	1	35	105.1	99.7	107 ↔ 206.7	1 ↓			33	68.2	1.54	2	9.3	0.68		33.5	0.00		100%
9196	Round Whitefish	Upper River	Susitna River PRM 206.7	9/19/13	10/26/13	36	29,021	3	1	3	2.9	2.6	206.7 ↔ 209.2		Kosina Creek	0 ↔ 0.1	1	62.3	0.55	2	9.7	7.04		30.2	0.00		100%
9198	Round Whitefish	Upper River	Susitna River PRM 206.7	9/19/13	6/4/15	623	15,265	8	2	30	170.6	47.4	178.2 ↔ 210.6	4 ↕	Kosina Creek	0 ↔ 15	16	62.2	0.90	8	8.4	3.31	6	33.9	0.62		83%
9201	Round Whitefish	Upper River	Susitna River PRM 198.1	9/20/13	4/30/14	222	136			12	33.3	21.8	187.6 ↔ 209.4				9	54.4	1.14	3	8.1	2.54		20.0	0.00		100%
9202	Round Whitefish	Upper River	Susitna River PRM 198.1	9/20/13	11/13/13	54	25			5	5.8	5.8	192.3 ↔ 198.1				3	44.6	0.97	2	7.1	4.06		20.6	0.00		100%
9203	Round Whitefish	Upper River	Susitna River PRM 203.5	9/20/13	3/25/15	551	699	6	2	27	41.8	25.7	185.1 ↔ 210.3	1 ↓	Deadman Creek	0 ↔ 0.5	19	58.4	1.18	6	8.8	2.47	2	30.7	0.24		96%
9204	Round Whitefish	Upper River	Susitna River PRM 203.5	9/20/13	12/18/13	89	39			4	6.3	5.7	197.8 ↔ 203.5				3	39.2	1.20	1	7.1	2.21		16.6	0.00		100%
9207	Round Whitefish	Upper River	Susitna River PRM 201.4	9/21/13	1/6/14	107	35			7	23.9	18.8	186.2 ↔ 205	1 ↓			7	48.9	1.60		8.0	0.00		21.1	0.00		100%
9208	Round Whitefish	Upper River	Susitna River PRM 201.4	9/21/13	8/30/14	343	2,480	5	3	22	154.3	95.2	127.6 ↔ 209.2	1 ↓	Gilbert Creek, Kosina Creek	0 ↔ 7.4	14	50.3	1.15	5	8.0	2.59	3	32.7	0.38		86%
9213	Round Whitefish	Upper River	Goose Creek TRM 0.1	9/22/13	10/29/13	37	2,406	3	2	2	29.9	26.1	209.2 ↔ 235.2		Goose Creek		1	62.3	0.83	1	9.7	5.35		31.7	0.00		0%
9218	Round Whitefish	Upper River	Susitna River PRM 206.7	9/23/13	11/13/13	51	25			5	16.2	16	190.9 ↔ 206.9				3	44.6	0.97	2	7.1	4.06		20.6	0.00		100%
9219	Round Whitefish	Upper River	Susitna River PRM 206.7	9/23/13	1/28/14	127	104			7	25.2	22.4	184.3 ↔ 206.7	1 ↓			6	49.1	1.33	1	7.7	1.42		19.7	0.00		100%
9220	Round Whitefish	Upper River	Susitna River PRM 206.7	9/23/13	1/6/14	105	52			6	7.8	7.2	199.8 ↔ 207				6	46.6	1.58		7.7	0.00		19.2	0.00		100%
9221	Round Whitefish	Upper River	Susitna River PRM 206.7	9/23/13	2/17/14	147	71			9	16.4	15.5	191.5 ↔ 207				8	50.4	1.32	1	7.6	1.09		16.7	0.00		100%
9223	Round Whitefish	Upper River	Susitna River PRM 196.4	9/23/13	11/13/13	51	21			4	6	5.4	191.6 ↔ 197				2	40.2	0.80	2	6.5	4.94		17.6	0.00		100%
9344	Round Whitefish	Upper River	Watana Creek TRM 0.1	6/6/14	6/23/15	382	9,374	12	2	26	66.5	15.7	193.6 ↔ 209.2		Watana Creek		21	69.1	1.46	5	9.1	2.63		46.7	0.00		100%
9346	Round Whitefish	Upper River	Watana Creek TRM 0.1	6/6/14	7/25/14	49	7,572	4	1	7	11.7	3.4	196.9 ↔ 200.3		Watana Creek		6	56.6	1.59	1	8.7	1.72		39.5	0.00		100%
9369	Round Whitefish	Upper River	Susitna River PRM 206.7	6/7/14	9/17/14	102	8,800	6	1	13	30.1	5.1	204.2 ↔ 209.2		Kosina Creek	0 ↔ 0.1	9	52.0	1.37	4	8.7	3.64		42.3	0.00		100%
9385	Round Whitefish	Upper River	Watana Creek TRM 0.1	6/8/14	6/23/15	380	43,295	13	2	27	65.5	17	195.4 ↔ 209.2		Watana Creek	0 ↔ 3.2	14	66.6	0.93	9	9.1	4.36	4	43.7	0.40		100%
9387	Round Whitefish	Upper River	Susitna River PRM 198.9	6/8/14	9/5/14	89	34,543	11	1	14	32.9	15.6	184.2 ↔ 198.9	1 ↓	Watana Creek	0 ↔ 0.9	9	50.3	1.21	4	8.3	3.26	1	35.7	0.19		100%

Table A-3. Tag summary for individual fish all seasons (Page 9 of 9).

All Seasons																											
Tag ID	Species	Tagging Segment	Release Location	Release Date	Last Live Date	Days Active	Total Detections	Fixed Station Events	# Fixed Stations Detected	# Aerial Surveys Detected	Distance Traveled (RM)	Linear Home Range (mi)	Mainstem Range (PRM)	Movments Past Dam Site	Tributaries & Lakes	Tributary Range (TRM)	Mainstem Aerial Detections	Ave Mainstem Survey Length (mi)	Mainstem Selection Ratio	Confluence Areal Detections	Ave Confluence Survey Length (mi)	Confluence Selection Ratio	Tributary Aerial Detections	Ave Tributary Survey Length (mi)	Tributary Selection Ratio	Lake Aerial Detections	% Aerial Detections in ZHI
9389	Round Whitefish	Upper River	Susitna River PRM 198.9	6/8/14	6/4/15	361	14,220	3	1	25	29.9	10.8	196.4 ↔ 200.5		Watana Creek	0 ↔ 6.7	17	68.4	1.19	7	9.0	3.74	1	42.7	0.11		100%
9390	Round Whitefish	Upper River	Susitna River PRM 198.9	6/8/14	6/23/15	380	25,063	11	2	27	118.4	32.1	177.1 ↔ 209.2	2 ↕			23	62.8	1.50	4	8.5	1.93		39.4	0.00		100%
9505	Round Whitefish	Upper River	Susitna River PRM 247.3	9/2/14	10/14/14	42	5			1	1.5	1.5	247.3 ↔ 247.3		Tyone River	0 ↔ 1.5		74.0	0.00		10.5	0.00	1	67.6	2.25		0%
9506	Round Whitefish	Upper River	Susitna River PRM 247.3	9/2/14	10/14/14	42	20			3	0.5	0.3	247.3 ↔ 247.3		Tyone River	0 ↔ 0.3		73.4	0.00	1	10.3	4.71	2	61.5	1.57		0%
9524	Round Whitefish	Upper River	Susitna River PRM 213.6	9/4/14	1/6/15	124	65			7	59.7	38.7	195.9 ↔ 234.6				4	72.3	1.04	3	8.9	6.38		50.7	0.00		71%
9526	Round Whitefish	Upper River	Susitna River PRM 206.7	9/4/14	6/4/15	273	12,031	4	1	15	35.3	22.3	204.7 ↔ 227				12	81.0	1.42	3	9.7	2.97		53.1	0.00		100%
9527	Round Whitefish	Upper River	Susitna River PRM 206.7	9/4/14	6/4/15	273	10,357	2	1	14	33.8	16.3	195.4 ↔ 210.3		Kosina Creek	0 ↔ 1.4	11	81.6	1.40	2	9.7	2.14	1	53.9	0.19		100%
9528	Round Whitefish	Upper River	Susitna River PRM 206.7	9/4/14	6/23/15	292	8,607	3	1	15	43.9	16.1	195.4 ↔ 209.2		Kosina Creek	0 ↔ 2.3	5	83.3	0.57	8	9.5	7.91	2	48.6	0.39		100%
9529	Round Whitefish	Upper River	Susitna River PRM 206.7	9/4/14	2/19/15	168	10,185	2	1	10	22.7	14.7	196.6 ↔ 211.3				6	75.2	1.10	4	9.3	5.96		53.4	0.00		100%
9543	Round Whitefish	Upper River	Susitna River PRM 206.7	9/6/14	10/14/14	38	7			1	0.7	0.7	206 ↔ 206.7					74.0	0.00	1	10.5	14.49		67.6	0.00		100%
9544	Round Whitefish	Upper River	Susitna River PRM 206.7	9/6/14	10/2/14	26	7			2	5.4	5.3	201.4 ↔ 206.7				2	73.1	1.94		10.2	0.00		58.5	0.00		100%
9545	Round Whitefish	Upper River	Susitna River PRM 198.9	9/6/14	6/23/15	290	1,406	1	1	12	10.8	8.8	190.1 ↔ 198.9				12	83.3	1.68		9.6	0.00		47.4	0.00		100%
9551	Round Whitefish	Upper River	Susitna River PRM 198.9	9/7/14	1/6/15	121	849	1	1	5	6.8	6.8	192.1 ↔ 198.9				5	74.9	1.95		9.5	0.00		62.0	0.00		100%
9552	Round Whitefish	Upper River	Susitna River PRM 198.9	9/7/14	10/14/14	37	22			3	15.7	11.7	191.2 ↔ 202.9				3	73.4	1.98		10.3	0.00		61.5	0.00		100%
9553	Round Whitefish	Upper River	Susitna River PRM 198.9	9/7/14	10/16/14	39	262	2	2	1	11.7	11.7	187.2 ↔ 198.9				1	74.0	2.16		10.7	0.00		75.0	0.00		100%
9556	Round Whitefish	Upper River	Susitna River PRM 198.9	9/7/14	12/17/14	101	306	3	3	4	50.5	50.5	148.4 ↔ 198.9	1 ↓			3	59.3	1.54	1	8.7	3.52		54.0	0.00		100%
9557	Round Whitefish	Upper River	Susitna River PRM 198.9	9/7/14	9/22/14	15	812	4	3	1	36.7	32.1	167 ↔ 198.9	1 ↓	Unnamed 194.8	0 ↔ 0.2		74.0	0.00	1	10.7	14.93		75.0	0.00		100%
9560	Round Whitefish	Upper River	Susitna River PRM 198.9	9/7/14	10/9/14	32	3,068	3	3	1	31.9	31.9	167 ↔ 198.9	1 ↓			1	72.1	1.71		9.6	0.00		41.9	0.00		100%

Table A-4. Tag summary for individual fish during the foraging season (Page 1 of 9).

																Foraging Season											
Tag ID	Species	Tagging Segment	Release Location	Release Date	Last Live Date	Days Active	Total Detections	Fixed Station Events	# Fixed Stations Detected	# Aerial Surveys Detected	Distance Traveled (RM)	Linear Home Range (mi)	Mainstem Range (PRM)	Movments Past Dam Site	Tributaries & Lakes	Tributary Range (TRM)	Mainstem Aerial Detections	Ave Mainstem Survey Length (mi)	Mainstem Selection Ratio	Confluence Areal Detections	Ave Confluence Survey Length (mi)	Confluence Selection Ratio	Tributary Aerial Detections	Ave Tributary Survey Length (mi)	Tributary Selection Ratio	Lake Aerial Detections	% Aerial Detections in ZHI
9001	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 124.2	6/13/13	7/28/13	45	185	3	3	9	40.9	36.5	124.2 ↔ 152.3		Portage Creek	0 ↔ 8.4		27.7	0.0		3.6	0.0	9	25.8	2.2		0%
9002	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 124.2	6/13/13	7/25/14	407	516	3	2	22	105.9	47.3	116.8 ↔ 152.3		Portage Creek	0 ↔ 11.8		37.2	0.0		5.3	0.0	22	37.6	2.1		0%
9003	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 124.2	6/13/13	8/27/13	75	40			11	19.2	41.4	124.2 ↔ 152.3		Portage Creek	0 ↔ 13.3	1	30.9	0.2		4.3	0.0	10	39.1	1.7		9%
9004	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 124.2	6/13/13	10/28/14	502	51789	20	1	45	35.6	19.1	124.2 ↔ 142.1		Indian River	0 ↔ 1.2	3	45.2	0.1	17	6.6	5.2	25	38.6	1.3		38%
9007	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 124.2	6/14/13	7/9/13	25	22	1	1	3	34.8	33.6	124.2 ↔ 152.3		Portage Creek	0 ↔ 5.5		37.4	0.0		5.0	0.0	3	18.2	3.3		0%
9010	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 124.2	6/14/13	7/13/13	28	377	5	4	4	67	37.2	116.8 ↔ 152.3		Portage Creek	0 ↔ 1.7	1	32.6	0.4	1	4.0	3.0	2	10.8	2.2		50%
9014	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 124.2	6/15/13	3/25/15	648	1065	3	1	39	99.2	36.7	124.2 ↔ 152.3		Portage Creek	0 ↔ 8.6	4	39.0	0.2	3	5.8	1.2	32	43.9	1.7		18%
9015	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 124.2	6/16/13	8/10/13	55	6039	5	1	5	13.7	10.5	113.9 ↔ 124.2		Lane Creek	0 ↔ 0.2	1	55.9	0.3	4	7.5	10.3		33.2	0.0		80%
9016	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 124.2	6/16/13	12/17/14	549	12354	6	5	40	171.5	45.5	116.8 ↔ 152.3		Portage Creek	0 ↔ 10	5	35.1	0.3		5.1	0.0	35	42.1	1.7		13%
9020	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 124.2	6/16/13	8/12/13	57	1530	5	1	11	39	36.9	124.2 ↔ 152.8		Portage Creek	0 ↔ 8.3	3	38.5	0.5	3	5.1	3.6	5	24.6	1.3		55%
9029	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 124.2	6/17/13	8/10/13	54	1269	7	2	32	36.2	29.9	124.2 ↔ 152.4		Portage Creek	0 ↔ 1.7	2	17.5	0.1	9	2.6	3.6	21	12.6	1.7		34%
9115	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 152.3	7/23/13	8/27/13	35	116			23	20.3	17.3	135.5 ↔ 152.5		Portage Creek	0 ↔ 0.3	5	30.0	0.4	16	4.2	9.7	2	24.8	0.2		91%
9170	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 134.3	9/19/13	10/13/13	23	141	2	2	3	33.8	30	105.1 ↔ 135.1				3	53.8	1.9		7.9	0.0		41.9	0.0		100%
9227	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 134.3	9/25/13	10/22/13	27	8			3	0.1	0.1	134.2 ↔ 134.3					49.6	0.0	3	7.1	13.7		41.3	0.0		100%
9236	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 142	9/25/13	5/29/14	246	274	2	2	3	32.8	25.3	116.8 ↔ 142.1				2	49.7	1.2	1	7.6	4.0		33.8	0.0		100%
9091	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	7/18/13	7/23/13	5	16			3	1.2	0.3	184.4 ↔ 184.6		Tsusena Creek	0 ↔ 0.1		66.3	0.0	3	6.7	12.0		7.2	0.0		100%
9092	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	7/18/13	8/13/13	26	83			10	12.9	11.6	173.4 ↔ 184.6		Tsusena Creek	0 ↔ 0.4	3	60.3	0.4	6	6.0	7.4	1	7.8	1.0		90%
9093	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	7/18/13	9/23/13	67	152			20	3.3	1	184.4 ↔ 185.1		Tsusena Creek	0 ↔ 0.3	1	55.8	0.1	18	6.6	10.6	1	15.8	0.2		95%
9094	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	7/18/13	9/30/13	74	94			15	10.9	9.1	175.6 ↔ 184.6		Tsusena Creek	0 ↔ 0.1	7	58.9	0.7	8	7.5	6.2		20.8	0.0		100%
9095	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	7/18/13	10/15/13	89	178	1	1	17	20.7	17.7	167 ↔ 184.6		Tsusena Creek	0 ↔ 0.1	6	58.4	0.5	11	7.2	7.5		16.9	0.0		100%
9096	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	7/18/13	10/2/13	76	1575	2	1	18	22.9	18.5	167 ↔ 185.1		Tsusena Creek	0 ↔ 0.4	6	57.6	0.5	8	7.0	5.2	4	16.9	1.1		72%
9097	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	7/18/13	8/20/13	33	109	1	1	17	52.4	49.2	135.9 ↔ 184.6		Tsusena Creek, Unnamed 184.0	0 ↔ 0.4	7	50.7	0.5	9	5.1	6.8	1	10.5	0.4		82%
9098	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	7/18/13	9/16/13	60	85			16	11	7.8	176.9 ↔ 184.6		Tsusena Creek	0 ↔ 0.1	10	60.0	0.9	6	7.3	4.4		17.7	0.0		100%
9124	Arctic Grayling	Middle/Lower US of DC	Susitna River PRM 179.4	7/24/13	6/28/14	339	99			15	5.5	3.2	179.2 ↔ 181.8		Fog Creek	0 ↔ 0.6	8	59.1	0.9	6	8.1	4.8	1	30.2	0.2		87%
9125	Arctic Grayling	Middle/Lower US of DC	Susitna River PRM 179.4	7/24/13	12/18/13	147	36			10	40.1	19.7	178.8 ↔ 197.8		Fog Creek	0 ↔ 0.7	4	62.9	0.6	4	8.8	4.5	2	26.3	0.7		70%
9126	Arctic Grayling	Middle/Lower US of DC	Susitna River PRM 179.4	7/24/13	5/12/14	292	34			10	6.8	5.7	173.8 ↔ 179.4		Fog Creek	0 ↔ 0.1	4	66.7	0.6	6	9.7	6.6		30.0	0.0		90%
9127	Arctic Grayling	Middle/Lower US of DC	Susitna River PRM 179.4	7/24/13	9/7/13	45	9896	3	1	7	38.4	38.3	141.2 ↔ 179.4		Fog Creek	0 ↔ 0.1	4	47.2	1.0	3	7.4	4.6		25.1	0.0		100%
9128	Arctic Grayling	Middle/Lower US of DC	Susitna River PRM 179.4	7/24/13	12/18/13	147	57			11	7.4	6	174.5 ↔ 179.4		Fog Creek	0 ↔ 1.1	7	65.6	1.0		9.1	0.0	4	29.8	1.3		64%
9129	Arctic Grayling	Middle/Lower US of DC	Susitna River PRM 179.4	7/24/13	10/21/13	89	109			12	2.6	1.2	179 ↔ 180.1		Fog Creek	0 ↔ 0.1	2	61.3	0.3	10	8.5	9.5		26.4	0.0		92%
9130	Arctic Grayling	Middle/Lower US of DC	Susitna River PRM 179.4	7/24/13	12/18/13	147	85			13	5.1	3.2	179.2 ↔ 182.2		Fog Creek	0 ↔ 0.2	3	60.1	0.4	10	8.3	8.9		28.2	0.0		85%
9131	Arctic Grayling	Middle/Lower US of DC	Susitna River PRM 179.4	7/24/13	11/13/13	112	20368	1	1	10	15.6	13	167 ↔ 179.4		Fog Creek	0 ↔ 0.6	5	67.1	0.8	4	9.3	4.6	1	31.3	0.3		90%
9164	Arctic Grayling	Middle/Lower US of DC	Susitna River PRM 175	8/21/13	8/21/13	0																					
9240	Arctic Grayling	Middle/Lower US of DC	Susitna River PRM 179.4	9/26/13	9/5/14	344	123			16	15.4	9.4	175 ↔ 184		Fog Creek	0 ↔ 0.4	3	53.0	0.4	12	8.6	8.7	1	37.7	0.2		75%
9241	Arctic Grayling	Middle/Lower US of DC	Susitna River PRM 179.4	9/26/13	12/2/13	67	9			3	3.7	3.7	179.4 ↔ 183.1				3	63.5	1.8		8.4	0.0		39.4	0.0		100%
9381	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	6/8/14	6/23/15	380	262			20	5.1	0.6	184.5 ↔ 184.7	1 ↓	Tsusena Creek	0 ↔ 0.4	2	58.6	0.2	17	8.9	10.2	1	39.4	0.1		80%
9382	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	6/8/14	7/14/14	36	112	1	1	7	32.8	29.6	155.1 ↔ 184.6		Tsusena Creek	0 ↔ 0.1	4	34.7	1.0	3	5.4	4.6		17.8	0.0		100%
9406	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	6/9/14	7/10/14	31	116	3	3	6	55.9	54.5	130.2 ↔ 184.6		Tsusena Creek	0 ↔ 0.1	2	50.0	0.6	4	7.6	7.4		26.1	0.0		100%
9407	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	6/9/14	6/23/15	379	308			17	11.8	3.9	181.1 ↔ 184.8	1 ↓	Tsusena Creek, Unnamed 184.0	0 ↔ 0.1	4	57.3	0.4	13	8.7	8.9		35.8	0.0		94%
9408	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	6/9/14	6/23/15	379	676	2	2	21	42.9	38.5	184.5 ↔ 222.7	2 ↕	Tsusena Creek	0 ↔ 0.3	3	56.8	0.3	16	8.6	9.1	2	37.6	0.3		86%
9409	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	6/9/14	9/17/14	100	191	1	1	16	23.7	18	167 ↔ 184.7		Tsusena Creek	0 ↔ 0.3	3	51.6	0.3	12	8.4	8.5	1	34.9	0.2		88%
9410	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	6/9/14	7/10/14	31	57			6	3.2	1	183.8 ↔ 184.7		Tsusena Creek	0 ↔ 0.1	1	54.6	0.3	5	8.5	9.4		32.5	0.0		100%
9411	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	6/9/14	6/23/15	379	3781	1	1	17	58.1	32.5	184.3 ↔ 197.8	2 ↕	Tsusena Creek	0 ↔ 19	4	60.8	0.4	8	9.0	5.8	5	40.3	0.8		71%
9081	Arctic Grayling	Upper River	Oshetna River TRM 18.3	7/17/13	2/17/14	215	164	1	1		18.4	18.3	235.1 ↔ 235.1		Oshetna River	0 ↔ 18.3											
9082	Arctic Grayling	Upper River	Oshetna River TRM 18.3	7/17/13	9/2/13	47	9			2	10.7	10.7			Oshetna River	7.6 ↔ 18.3		62.3	0.0		9.7	0.0	2	41.4	2.7		0%
9083	Arctic Grayling	Upper River	Oshetna River TRM 21.7	7/17/13	10/18/13	93	11	1	1		21.8	21.7	235.1 ↔ 235.1		Oshetna River	0 ↔ 21.7											
9084	Arctic Grayling	Upper River	Oshetna River TRM 21.7	7/17/13	10/7/13	82	44			6	13.9	13.7			Oshetna River	8 ↔ 21.7		62.3	0.0		9.7	0.0	6	36.0	3.0		0%
9085	Arctic Grayling	Upper River	Oshetna River TRM 21.7	7/17/13	6/29/14	347	566	2	1		21.8	21.8	235.1 ↔ 235.2		Oshetna River	0 ↔ 21.7											
9086	Arctic Grayling	Upper River	Oshetna River TRM 21.7	7/17/13	6/23/15	706	1402	3	1	7	27.5	21.8	235.1 ↔ 235.2		Oshetna River	0 ↔ 21.7		71.6	0.0		9.6	0.0	7	50.9	2.6		0%
9087	Arctic Grayling	Upper River	Oshetna River TRM 21.7	7/17/13	7/17/13	0																					
9088	Arctic Grayling	Upper River	Oshetna River TRM 21.7	7/17/13	7/17/13	0																					

Table A-4. Tag summary for individual fish during the foraging season (Page 2 of 9).

Foraging Season																										
Tag ID	Species	Tagging Segment	Release Location	Release Date	Last Live Date	Days Active	Total Detections	Fixed Station Events	# Fixed Stations Detected	# Aerial Surveys Detected	Distance Traveled (RM)	Linear Home Range (mi)	Mainstem Range (PRM)	Movments Past Dam Site	Tributaries & Lakes	Tributary Range (TRM)	Mainstem Aerial Detections	Ave Mainstem Survey Length (mi)	Mainstem Selection Ratio	Confluence Areal Detections	Ave Confluence Survey Length (mi)	Confluence Selection Ratio	Tributary Aerial Detections	Ave Tributary Survey Length (mi)	Tributary Selection Ratio	Lake Aerial Detections	% Aerial Detections in ZHI
9089	Arctic Grayling	Upper River	Susitna River PRM 189.5	7/18/13	9/2/13	46	32			9	8.4	7.7	183.8 ↔ 189.5	1 ↓	Tsusena Creek, Unnamed 184.0	0 ↔ 1.5	1	65.4	0.2	3	7.5	4.0	5	17.6	2.9		44%
9090	Arctic Grayling	Upper River	Susitna River PRM 189.5	7/18/13	7/26/13	8	7			2	9	9	180.5 ↔ 189.5	1 ↓			1	58.0	0.6	1	5.8	5.8		3.7	0.0		100%
9099	Arctic Grayling	Upper River	Watana Creek TRM 0.1	7/18/13	5/20/14	306	61			9	13.4	6.5	196.9 ↔ 198.4		Watana Creek	0 ↔ 5	5	59.8	1.0	3	8.9	3.9	1	35.2	0.3		100%
9100	Arctic Grayling	Upper River	Watana Creek TRM 0.1	7/18/13	12/2/13	137	76			12	6.4	3.9	193.6 ↔ 197.3		Watana Creek	0 ↔ 0.2	3	61.1	0.4	9	8.9	7.9		24.0	0.0		100%
9101	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	7/19/13	10/9/13	82	21260	6	2	10	85.1	82.5	127.7 ↔ 209.2	1 ↓	Kosina Creek	0 ↔ 1	4	67.5	0.6	3	8.9	3.6	3	29.7	1.1		100%
9102	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	7/19/13	9/30/13	73	7726	3	1	11	17.2	13.7	196.9 ↔ 209.6		Kosina Creek, Watana Creek	0 ↔ 0.9	1	66.4	0.1	3	9.3	3.0	7	26.5	2.5		100%
9103	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	7/19/13	7/31/13	12	10250	2	1	1	0.4	0.3	209.1 ↔ 209.3		Kosina Creek	0 ↔ 0.1		51.2	0.0	1	6.7	9.0		2.1	0.0		100%
9104	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	7/19/13	9/9/13	52	11863	7	1	6	11	1.6	207.7 ↔ 209.2		Kosina Creek	0 ↔ 0.1	5	67.9	1.3	1	9.2	1.9		25.6	0.0		100%
9105	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	7/19/13	8/20/13	32	13534	5	1	5	2.8	1.1	209.1 ↔ 209.9		Kosina Creek	0 ↔ 0.3	1	80.3	0.3	3	8.9	7.0	1	13.8	1.5		100%
9106	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	7/19/13	8/26/13	38	4619	1	1	3	24.7	24.5	184.7 ↔ 209.1	1 ↓	Kosina Creek	0 ↔ 0.1	2	62.3	1.1	1	9.7	3.4		26.3	0.0		100%
9107	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	7/19/13	6/29/14	345	30337	11	1	16	32.2	13.3	200 ↔ 209.2		Kosina Creek	0 ↔ 4.1	8	59.7	0.8	4	8.8	2.9	4	31.9	0.8		81%
9108	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	7/19/13	9/24/13	67	5767	2	2	17	54.5	50.2	160.5 ↔ 209.1	1 ↓	Chinook Creek, Kosina Creek	0 ↔ 1	5	14.4	0.4	10	1.9	5.9	2	2.7	0.8		71%
9109	Arctic Grayling	Upper River	Goose Creek TRM 0.3	7/22/13	7/31/13	9	698	1	1		23.9	0.3	232.8 ↔ 232.8		Goose Creek	0 ↔ 0.3											
9110	Arctic Grayling	Upper River	Goose Creek TRM 0.3	7/22/13	8/6/13	15	6			2	16	16	217.1 ↔ 232.8		Goose Creek	0 ↔ 0.3	2	106.7	1.3		9.8	0.0		17.7	0.0		100%
9111	Arctic Grayling	Upper River	Goose Creek TRM 0.1	7/22/13	8/13/13	22	13			3	31.6	31.6	201.3 ↔ 232.8		Goose Creek	0 ↔ 0.1	2	91.9	0.9	1	9.7	4.1		16.7	0.0		100%
9113	Arctic Grayling	Upper River	Clearwater Creek TRM 0.9	7/22/13	7/22/13	0																				
9114	Arctic Grayling	Upper River	Clearwater Creek TRM 0.9	7/22/13	11/11/13	112	1					0.9			Clearwater Creek	0.9 ↔ 0.9										
9132	Arctic Grayling	Upper River	Watana Creek TRM 0.1	7/25/13	8/6/13	12	9			2	0.6	0.1	196.9 ↔ 196.9		Watana Creek	0 ↔ 0.1		72.3	0.0	2	8.7	10.7		12.1	0.0		100%
9139	Arctic Grayling	Upper River	Susitna River PRM 189.5	7/27/13	8/26/13	30	55			7	1.2	0.6	189.2 ↔ 189.7		Deadman Creek	0 ↔ 0.1	1	54.5	0.2	6	7.3	9.1		16.0	0.0		100%
9140	Arctic Grayling	Upper River	Susitna River PRM 189.5	7/27/13	9/16/13	51	34	1	1	9	24.7	22.6	167 ↔ 189.5	1 ↓	Unnamed 184.0	0 ↔ 0.1	6	54.2	1.0	3	7.3	3.8		22.4	0.0		89%
9141	Arctic Grayling	Upper River	Susitna River PRM 189.5	7/27/13	1/28/14	185	60			13	4.4	1.7	188.1 ↔ 189.5		Deadman Creek	0 ↔ 0.3	5	62.0	0.6	7	8.8	6.1	1	28.8	0.3		100%
9142	Arctic Grayling	Upper River	Susitna River PRM 189.5	7/27/13	4/30/14	277	129			16	12.5	10.6	179.3 ↔ 189.5	1 ↓	Fog Creek, Tsusena Creek	0 ↔ 0.3	4	58.6	0.4	11	7.6	8.1	1	23.3	0.2		88%
9143	Arctic Grayling	Upper River	Susitna River PRM 189.5	7/27/13	5/20/14	297	91	1	1	13	3.5	21.5	187.8 ↔ 209.2		Deadman Creek	0 ↔ 0.1	4	58.1	0.5	9	8.4	7.5		24.4	0.0		100%
9163	Arctic Grayling	Upper River	Susitna River PRM 203.5	8/20/13	5/20/14	273	50			8	8.7	31.9	171.7 ↔ 203.5		Watana Creek	0 ↔ 0.1	5	58.0	1.1	3	9.0	4.4		37.6	0.0		100%
9171	Arctic Grayling	Upper River	Watana Creek TRM 0.1	9/18/13	5/20/14	244	34			5	1.9	22.1	176 ↔ 198		Watana Creek	0 ↔ 0.1	3	55.4	1.1	2	8.6	4.6		34.3	0.0		100%
9172	Arctic Grayling	Upper River	Watana Creek TRM 0.1	9/18/13	4/30/14	224	11			3	3.4	3.4	196.9 ↔ 200.2		Watana Creek	0 ↔ 0.1	2	46.9	1.1	1	7.7	3.3		22.2	0.0		100%
9173	Arctic Grayling	Upper River	Watana Creek TRM 0.1	9/18/13	1/6/15	475	6326	1	1	7	20	12.5	196.8 ↔ 197.4		Watana Creek	0 ↔ 11.9	1	55.8	0.3	3	8.8	5.1	3	40.5	1.1		71%
9174	Arctic Grayling	Upper River	Watana Creek TRM 0.1	9/18/13	4/30/14	224	16			4	4.8	4.8	196.9 ↔ 201.6		Watana Creek	0 ↔ 0.1	3	50.8	1.2	1	8.2	2.6		24.8	0.0		100%
9175	Arctic Grayling	Upper River	Watana Creek TRM 0.1	9/18/13	6/2/14	257	143	1	1	4	7.9	18.2	196.9 ↔ 215		Watana Creek	0 ↔ 0.1	4	65.2	1.8		9.9	0.0		40.8	0.0		100%
9176	Arctic Grayling	Upper River	Watana Creek TRM 0.1	9/18/13	10/22/13	34	13			4	2.7	2.7	194.3 ↔ 196.9		Watana Creek	0 ↔ 0.1	4	50.8	1.6		8.2	0.0		24.8	0.0		100%
9177	Arctic Grayling	Upper River	Watana Creek TRM 0.1	9/18/13	11/12/13	55	21			2	1.6	1.6	196.9 ↔ 198.4		Watana Creek	0 ↔ 0.1	1	62.3	0.8	1	9.7	5.2		29.1	0.0		100%
9179	Arctic Grayling	Upper River	Watana Creek TRM 0.1	9/18/13	12/18/13	91	10			2	0.8	0.8	196.2 ↔ 196.9		Watana Creek	0 ↔ 0.1	1	62.3	0.8	1	9.7	5.3		31.7	0.0		100%
9181	Arctic Grayling	Upper River	Watana Creek TRM 0.1	9/18/13	10/7/13	19	12			3	3.1	3.1	196.9 ↔ 199.9		Watana Creek	0 ↔ 0.1	2	62.3	1.1	1	9.7	3.5		30.2	0.0		100%
9182	Arctic Grayling	Upper River	Watana Creek TRM 0.1	9/18/13	1/6/14	110	32			4	2.8	2.3	196.9 ↔ 199.1		Watana Creek	0 ↔ 0.1	3	50.8	1.2	1	8.2	2.6		24.8	0.0		100%
9184	Arctic Grayling	Upper River	Watana Creek TRM 0.1	9/18/13	6/16/14	271	82			6	3.5	5.2	196.9 ↔ 202		Watana Creek	0 ↔ 0.1	5	66.3	1.4	1	9.7	2.0		38.8	0.0		100%
9185	Arctic Grayling	Upper River	Susitna River PRM 187.7	9/19/13	11/13/13	55	16			4	6.1	6.1	181.6 ↔ 187.7	1 ↓			4	63.2	1.7		8.8	0.0		37.3	0.0		100%
9186	Arctic Grayling	Upper River	Susitna River PRM 208.3	9/19/13	11/11/13	53	2024	3	2	3	29.3	27.3	208.1 ↔ 235.4				3	62.3	1.6		9.7	0.0		30.2	0.0		67%
9187	Arctic Grayling	Upper River	Susitna River PRM 208.3	9/19/13	6/4/15	623	49627	20	2	18	58.3	53.3	207.9 ↔ 247.3		Tyone River	0 ↔ 13.9	17	54.9	1.7		8.5	0.0	1	37.5	0.1		94%
9188	Arctic Grayling	Upper River	Susitna River PRM 208.3	9/19/13	3/18/14	180	13793	4	1	4	11.1	3.6	205.6 ↔ 209.2				4	50.8	1.6		8.2	0.0		24.8	0.0		100%
9189	Arctic Grayling	Upper River	Susitna River PRM 206.7	9/19/13	6/11/14	265	1331	4	2	3	59.4	30.9	204.3 ↔ 235.2				2	66.2	1.1	1	9.8	3.9		37.7	0.0		100%
9194	Arctic Grayling	Upper River	Susitna River PRM 206.7	9/19/13	12/3/13	75	2685	5	3	3	72.8	67.1	142.1 ↔ 209.2	1 ↓			2	53.2	1.2	1	8.0	4.0		33.9	0.0		100%
9210	Arctic Grayling	Upper River	Susitna River PRM 211	9/22/13	7/10/14	291	140	1	1	10	8.5	8.2	209.1 ↔ 211.1		Kosina Creek	0 ↔ 6.2		59.7	0.0	4	8.8	5.1	6	44.7	1.5		50%
9211	Arctic Grayling	Upper River	Susitna River PRM 211	9/22/13	10/21/13	29	37			4	0.3	0.2	211 ↔ 211.1		Jay Creek	0 ↔ 0.1		63.2	0.0	4	8.8	12.5		37.3	0.0		100%
9212	Arctic Grayling	Upper River	Goose Creek TRM 0.1	9/22/13	9/23/14	366	48666	5	1	13	22.6	9.8	228.7 ↔ 235.2		Goose Creek, Oshetna River	0 ↔ 3	1	63.4	0.1	1	9.0	1.0	11	45.9	2.2		8%
9214	Arctic Grayling	Upper River	Goose Creek TRM 0.1	9/22/13	7/5/14	286	2763	3	2	3	39.5	6	232.8 ↔ 235.2		Goose Creek	0 ↔ 3.6	1	56.8	0.7		8.4	0.0	2	47.3	1.6		0%
9215	Arctic Grayling	Upper River	Goose Creek TRM 0.1	9/22/13	11/11/13	50	2495	2	1	2	5.9	3.7	232.8 ↔ 235.2		Goose Creek, Oshetna River	0 ↔ 1.2	1	62.3	0.8		9.7	0.0	1	29.1	1.7		50%
9216	Arctic Grayling	Upper River	Goose Creek TRM 0.1	9/22/13	11/11/13	50	982	2	1	3	6.1	2.5	232.8 ↔ 235.2		Goose Creek	0 ↔ 0.1	3	62.3	1.6		9.7	0.0		30.2	0.0		33%
9217	Arctic Grayling	Upper River	Goose Creek TRM 0.1	9/22/13	6/23/15	639	157			16	10.2	9.6	228.6 ↔ 232.8		Goose Creek	0 ↔ 5.4	3	64.2	0.3		8.8	0.0	13	45.4	2.1		19%
9225	Arctic Grayling	Upper River	Susitna River PRM 196.4	9/23/13	8/3/14	313	27562	5	1	11	28.3	19.7	196.4 ↔ 209.2		Kosina Creek	0 ↔ 6.9	5	55.5	0.8	3	8.7	3.3	3	39.3	0.7		82%
9226	Arctic Grayling	Upper River	Susitna River PRM 196.4	9/23/13	9/23/13	0																				

Table A-4. Tag summary for individual fish during the foraging season (Page 3 of 9).

																Foraging Season										
Tag ID	Species	Tagging Segment	Release Location	Release Date	Last Live Date	Days Active	Total Detections	Fixed Station Events	# Fixed Stations Detected	# Aerial Surveys Detected	Distance Traveled (RM)	Linear Home Range (mi)	Mainstem Range (PRM)	Movments Past Dam Site	Tributaries & Lakes	Tributary Range (TRM)	Mainstem Aerial Detections	Ave Mainstem Survey Length (mi)	Mainstem Selection Ratio	Confluence Areal Detections	Ave Confluence Survey Length (mi)	Confluence Selection Ratio	Tributary Aerial Detections	Ave Tributary Survey Length (mi)	Tributary Selection Ratio	Lake Aerial Detections	% Aerial Detections in ZHI
9300	Arctic Grayling	Upper River	Susitna River PRM 203.5	6/2/14	7/10/14	38	1543	3	1	6	23.2	16.4	193.5 ↔ 203.5		Watana Creek	0 ↔ 6.4	2	55.6	0.6	1	8.5	2.0	3	40.2	1.3		100%
9301	Arctic Grayling	Upper River	Susitna River PRM 203.5	6/2/14	6/23/15	386	63559	12	1	18	19.1	23.3	201.6 ↔ 224.5		Kosina Creek	0 ↔ 0.4	8	60.1	0.8	8	8.8	5.6	2	42.5	0.3		100%
9303	Arctic Grayling	Upper River	Susitna River PRM 203.5	6/2/14	6/23/15	386	489	1	1	21	54.6	29	184.2 ↔ 211.9	2 ↓	Tsusena Creek	0 ↔ 1.3	6	57.1	0.5	14	8.6	8.1	1	39.8	0.1		95%
9305	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/2/14	6/23/15	386	238			15	23.2	10.6	183.1 ↔ 190.6	2 ↓	Tsusena Creek	0 ↔ 3.1	6	60.5	0.7	2	9.1	1.6	7	39.7	1.3		53%
9306	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/2/14	2/3/15	246	283			15	4.3	1.4	188.9 ↔ 189.9		Deadman Creek	0 ↔ 0.4	3	53.7	0.4	11	8.9	8.3	1	39.1	0.2		100%
9311	Arctic Grayling	Upper River	Susitna River PRM 194.8	6/3/14	6/23/15	385	124	1	1	16	20.7	12.5	183.3 ↔ 194.8	2 ↓	Tsusena Creek	0 ↔ 1	6	56.9	0.7	4	8.8	3.0	6	39.0	1.0		56%
9312	Arctic Grayling	Upper River	Susitna River PRM 194.8	6/3/14	11/24/14	174	125	2	1	16	36.9	25	172 ↔ 197	1 ↓			7	45.8	0.8	9	7.6	6.4		32.3	0.0		100%
9313	Arctic Grayling	Upper River	Susitna River PRM 227.1	6/4/14	9/17/14	105	854	1	1	8	28.4	27.9	209.1 ↔ 227.3		Kosina Creek, Tsisi Creek	0 ↔ 3.6	4	61.8	1.0		9.2	0.0	4	50.1	1.2		63%
9314	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/4/14	10/2/14	120	145654	16	1	15	4	0.6	208.7 ↔ 209.2		Kosina Creek	0 ↔ 0.1	2	53.7	0.3	13	8.6	10.5		42.3	0.0		100%
9315	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/4/14	6/28/14	24	9150	4	2	5	33.6	33.1	176.2 ↔ 209.2	1 ↓	Kosina Creek	0 ↔ 0.1	2	53.0	0.7	3	8.2	6.5		26.7	0.0		100%
9317	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/4/14	12/4/14	183	35639	8	3	14	27.9	25.7	184.6 ↔ 209.3	1 ↓	Kosina Creek, Tsusena Creek	0 ↔ 0.9		53.6	0.0	6	8.8	5.0	8	40.4	1.5		43%
9318	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/4/14	10/2/14	120	156920	17	1	16	3.6	0.6	209 ↔ 209.4		Kosina Creek	0 ↔ 0.2	1	56.4	0.1	15	8.7	11.4		41.3	0.0		100%
9319	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/4/14	8/21/14	78	79309	10	1	12	10.6	9	200.4 ↔ 209.3		Kosina Creek	0 ↔ 0.1	3	53.1	0.5	9	8.6	8.6		37.6	0.0		100%
9320	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/4/14	6/23/15	384	140322	17	1	19	3.5	0.5	209 ↔ 209.4		Kosina Creek	0 ↔ 0.1	1	61.5	0.1	18	8.9	12.0		42.1	0.0		100%
9322	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/4/14	10/14/14	132	26578	5	2	12	26.7	21.4	187.9 ↔ 209.2		Kosina Creek	0 ↔ 0.1	7	53.2	1.1	5	8.8	4.9		42.4	0.0		100%
9323	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/4/14	4/23/15	323	171270	17	1	16	4.8	0.8	208.9 ↔ 209.4		Kosina Creek	0 ↔ 0.3	1	56.4	0.1	14	8.7	10.7	1	41.3	0.2		100%
9324	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/4/14	12/16/14	195	107134	14	2	16	20.4	14.7	196.9 ↔ 211.1		Kosina Creek, Watana Creek	0 ↔ 0.3	1	54.6	0.1	14	8.8	10.4	1	40.9	0.2		100%
9325	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/4/14	6/23/15	384	76222	15	3	18	55.5	25.1	184.6 ↔ 209.2	3 ↕	Kosina Creek, Tsusena Creek	0 ↔ 0.4	3	61.1	0.3	10	9.0	7.0	5	43.0	0.7		67%
9326	Arctic Grayling	Upper River	Susitna River PRM 203.5	6/4/14	2/3/15	244	812	2	1	12	18	8.9	196.9 ↔ 203.6		Watana Creek	0 ↔ 2.2	1	51.1	0.2	4	8.5	3.9	7	39.3	1.5		100%
9327	Arctic Grayling	Upper River	Susitna River PRM 203.5	6/4/14	6/29/14	25	123	3	3	3	62.2	61.8	142.1 ↔ 203.5	1 ↓	Tsusena Creek	0 ↔ 0.4	2	44.8	1.3		7.4	0.0	1	36.9	0.8		67%
9333	Arctic Grayling	Upper River	Susitna River PRM 206.7	6/5/14	6/4/15	364	4513	9	1	16	20.5	18.4	194.2 ↔ 209.2		Kosina Creek	0 ↔ 3.4	8	59.1	0.9	2	8.9	1.6	6	42.3	1.0		100%
9334	Arctic Grayling	Upper River	Susitna River PRM 206.7	6/5/14	2/3/15	243	2138	8	1	14	20.2	7.9	201.3 ↔ 209.2				10	55.4	1.4	4	8.9	3.5		43.9	0.0		100%
9335	Arctic Grayling	Upper River	Susitna River PRM 206.7	6/5/14	6/4/15	364	6915	2	1	12	35.7	27.1	196.9 ↔ 217.2		Watana Creek	0 ↔ 6.8	4	61.9	0.6	3	8.9	3.2	5	43.6	1.1		100%
9337	Arctic Grayling	Upper River	Susitna River PRM 227.1	6/5/14	1/6/15	215	21933	8	2	14	39	34.2	192.9 ↔ 227.1				9	55.3	1.2	5	8.8	4.3		42.7	0.0		100%
9349	Arctic Grayling	Upper River	Susitna River PRM 203.5	6/6/14	4/14/15	312	6435	13	1	13	36.1	5.7	203.5 ↔ 209.2				12	53.8	1.7	1	8.7	0.9		37.4	0.0		100%
9355	Arctic Grayling	Upper River	Watana Creek TRM 0.1	6/7/14	7/10/14	33	81	1	1	6	9.4	8.4	189 ↔ 197		Deadman Creek, Wantana Creek	0 ↔ 0.3	4	54.6	1.2	1	8.5	1.9	1	32.5	0.5		100%
9357	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/7/14	6/4/15	362	97842	16	1	16	8.8	14.6	194.7 ↔ 209.2		Kosina Creek	0 ↔ 0.1	4	58.7	0.5	12	8.8	9.5		43.2	0.0		100%
9358	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/7/14	9/30/14	115	27151	8	2	14	63.6	52.3	165.6 ↔ 209.3	1 ↓	Kosina Creek, Watana Creek	0 ↔ 8.5	3	46.6	0.4	6	7.6	5.3	5	38.9	0.9		100%
9359	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/7/14	6/28/14	21	7092	4	2	5	24.6	20.9	190 ↔ 209.1		Kosina Creek	0 ↔ 1.8	3	53.0	1.0		8.2	0.0	2	26.7	1.3		100%
9360	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/7/14	7/17/14	40	29066	7	1	6	3.4	1.3	208 ↔ 209.2		Kosina Creek	0 ↔ 0.1	1	55.6	0.3	5	8.5	10.2		40.2	0.0		100%
9361	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/7/14	9/17/14	102	71603	13	3	14	30.8	26.6	182.9 ↔ 209.4	1 ↓	Kosina Creek	0 ↔ 0.1	6	55.3	0.8	8	8.9	6.9		43.0	0.0		100%
9362	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/7/14	6/23/15	381	31735	8	2	14	34.5	20.8	196.9 ↔ 209.2		Kosina Creek, Watana Creek	0 ↔ 8.4	4	59.7	0.6	7	9.0	6.5	3	48.3	0.5		100%
9363	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/7/14	5/20/15	347	40271	11	1	15	16.4	29.6	179.7 ↔ 209.2	1 ↓	Kosina Creek	0 ↔ 0.1	11	55.6	1.3	4	8.5	3.2		36.6	0.0		100%
9364	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/7/14	8/11/14	65	41012	6	1	5	5	2.2	209.1 ↔ 211.2		Kosina Creek	0 ↔ 0.1		46.9	0.0	5	8.0	11.8		39.4	0.0		100%
9365	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/7/14	7/14/14	37	10373	6	2	5	18	14	197 ↔ 209.2		Kosina Creek	0 ↔ 1.8	1	54.1	0.4	2	8.5	5.1	2	45.1	1.0		100%
9366	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/7/14	7/25/14	48	59894	6	1	5	1.2	0.6	208.7 ↔ 209.2		Kosina Creek	0 ↔ 0.1	1	47.2	0.4	4	8.1	9.7		42.9	0.0		100%
9367	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/7/14	6/23/15	381	82851	18	1	19	20.6	1.7	207.9 ↔ 209.2		Kosina Creek	0 ↔ 0.4	11	59.3	1.1	7	8.9	4.6	1	44.3	0.1		100%
9374	Arctic Grayling	Upper River	Susitna River PRM 196.4	6/7/14	8/3/14	57	157	1	1	8	20.8	19.7	179.2 ↔ 197	1 ↓	Fog Creek	0 ↔ 1.9	3	53.5	0.7	3	8.5	4.3	2	36.0	0.7		75%
9383	Arctic Grayling	Upper River	Watana Creek TRM 0.1	6/8/14	6/17/14	9	89	4	4	2	134	134	64.7 ↔ 196.9	1 ↓	Kashwitna River, Watana Creek	0 ↔ 1.7	1	69.6	0.6		7.4	0.0	1	7.0	6.0		50%
9386	Arctic Grayling	Upper River	Susitna River PRM 198.9	6/8/14	10/14/14	128	16969	4	1	8	25.7	13.8	196.9 ↔ 198.9		Watana Creek	0 ↔ 11.8	1	54.5	0.2	2	8.6	3.1	5	43.7	1.5		63%
9391	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	7/4/14	25	380	3	3	5	105.9	105.9	83.6 ↔ 189.5	1 ↓			5	78.1	1.4		7.7	0.0		20.0	0.0		100%
9392	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	8/13/14	65	785	5	5	10	92.7	91.3	98.8 ↔ 189.6	1 ↓	Fog Creek	0 ↔ 0.5	7	55.6	1.2	2	8.5	2.2	1	28.1	0.3		90%
9393	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	6/28/14	19	63			4	2.2	1.2	189.3 ↔ 190.4		Deadman Creek	0 ↔ 0.1	1	47.8	0.4	3	7.6	7.4		20.0	0.0		100%
9394	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	6/28/14	19	28			5	7.4	6.9	182.7 ↔ 189.5	1 ↓	Deadman Creek	0 ↔ 0.1	2	53.0	0.7	3	8.2	6.5		26.7	0.0		100%
9395	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	10/20/14	132	102			14	4.5	1.5	188.8 ↔ 189.8		Deadman Creek	0 ↔ 0.5	2	54.7	0.3	7	8.8	5.8	5	39.6	0.9		93%
9396	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	7/15/14	36	125	1	1	6	24.3	23.2	167 ↔ 189.9	1 ↓	Deadman Creek	0 ↔ 0.3	3	54.6	0.9	2	8.5	3.8	1	32.5	0.5		100%
9397	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	8/22/14	74	448	1	1	12	23.9	22.6	167 ↔ 189.6	1 ↓			9	42.8	1.3	3	7.3	2.6		25.8	0.0		100%
9399	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	7/22/14	43	150	1	1	6	25.9	6.5	184.6 ↔ 189.7	1 ↓	Tsusena Creek	0 ↔ 1.4	1	48.8	0.3		8.2	0.0	5	30.6	2.4		17%
9400	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	10/2/14	115	88			16	22.1	16.1	173.5 ↔ 189.5	1 ↓	Deadman Creek	0 ↔ 0.1	9	49.3	1.0	7	7.9	4.9		31.9	0.0		100%
9401	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	8/21/14	73	54			10	2.3	1.1	188.7 ↔ 189.8				6	53.0	1.1	4	8.6	4.5		34.7	0.0		100%

Table A-4. Tag summary for individual fish during the foraging season (Page 4 of 9).

																Foraging Season										
Tag ID	Species	Tagging Segment	Release Location	Release Date	Last Live Date	Days Active	Total Detections	Fixed Station Events	# Fixed Stations Detected	# Aerial Surveys Detected	Distance Traveled (RM)	Linear Home Range (mi)	Mainstem Range (PRM)	Movments Past Dam Site	Tributaries & Lakes	Tributary Range (TRM)	Mainstem Aerial Detections	Ave Mainstem Survey Length (mi)	Mainstem Selection Ratio	Confluence Areal Detections	Ave Confluence Survey Length (mi)	Confluence Selection Ratio	Tributary Aerial Detections	Ave Tributary Survey Length (mi)	Tributary Selection Ratio	Lake Aerial Detections	% Aerial Detections in ZHI
9402	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	7/17/14	38	181	2	2	8	41	39.1	152.1 ↔ 191.2	1 ↓			5	46.4	1.1	3	7.1	4.3		27.6	0.0		100%
9403	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	6/4/15	360	171	1	1	17	10.4	6.8	183.8 ↔ 190.1	1 ↓	Deadman Creek, Tsusena Creek	0 ↔ 0.3	3	55.2	0.3	12	8.8	8.3	2	39.6	0.3		82%
9404	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	8/6/14	58	112			12	10.4	8	181.8 ↔ 189.5	1 ↓	Deadman Creek	0 ↔ 0.3	4	48.9	0.6	7	8.1	6.5	1	32.7	0.2		100%
9047	Burbot	Middle/Lower DS of DC	Susitna River PRM 107	6/21/13	10/24/13	125	4466	2	1	13	15.8	10.1	97 ↔ 107		Talkeetna River	0 ↔ 0.1	8	62.2	0.9	5	8.2	4.3		20.9	0.0		100%
9050	Burbot	Middle/Lower DS of DC	Susitna River PRM 107	6/21/13	3/19/14	271	2255	3	1	11	13.3	5.9	102.2 ↔ 107		Chulitna River	0 ↔ 1.1	8	57.4	1.1	1	7.7	1.0	2	20.6	0.8		82%
9144	Burbot	Middle/Lower DS of DC	Susitna River PRM 124.2	8/8/13	8/12/13	4	7			1	0.3	0.3	123.9 ↔ 124.2				1	34.9	2.9		5.3	0.0		59.7	0.0		100%
9147	Burbot	Middle/Lower DS of DC	Susitna River PRM 33.9	8/16/13	9/13/13	28	7			2	0.4	0.2	33.7 ↔ 33.9				1	72.1	0.6	1	9.7	4.7		9.5	0.0		0%
9148	Burbot	Middle/Lower DS of DC	Susitna River PRM 33.9	8/16/13	9/20/13	35	23			4	3.6	3.1	31.3 ↔ 34.4				2	66.6	0.6	2	8.7	4.8		7.6	0.0		0%
9149	Burbot	Middle/Lower DS of DC	Susitna River PRM 33.8	8/16/13	8/30/13	14	11			2	0.8	0.8	33 ↔ 33.8				2	72.1	1.3		9.7	0.0		12.9	0.0		0%
9150	Burbot	Middle/Lower DS of DC	Fish Creek (Kroto) TRM 1.9	8/16/13	9/20/13	35	9			2	2.6	3.4			Fish Creek (Kroto), Yentna River	0.4 ↔ 1.9		70.6	0.0		9.5	0.0	2	9.4	9.6		0%
9245	Burbot	Middle/Lower DS of DC	Susitna River PRM 80.9	9/28/13	12/17/14	445	39			7	3.3	1.7	80.5 ↔ 82.2				5	74.9	1.1	2	8.8	3.7		30.6	0.0		86%
9246	Burbot	Middle/Lower DS of DC	Susitna River PRM 80.9	9/28/13	10/24/13	26	31			2	2.6	2.6	78.3 ↔ 80.9				2	77.5	1.3		8.4	0.0		15.3	0.0		0%
9561	Burbot	Middle/Lower US of DC	Susitna River PRM 186.8	9/8/14	12/16/14	99	54651	2	1	1	1.6	0.6	186.6 ↔ 187.2	3 ↕			1	74.0	2.2		10.7	0.0		75.0	0.0		100%
9562	Burbot	Middle/Lower US of DC	Susitna River PRM 186.8	9/8/14	10/29/14	51	37620	2	1	1	1.6	0.6	186.6 ↔ 187.2	3 ↕			1	74.0	2.2		10.7	0.0		75.0	0.0		100%
9563	Burbot	Middle/Lower US of DC	Susitna River PRM 183.8	9/8/14	6/23/15	288	22			3	3.1	6.5	180.7 ↔ 187.2	1 ↑			3	86.5	1.9		10.8	0.0		71.0	0.0		100%
9564	Burbot	Middle/Lower US of DC	Susitna River PRM 185.2	9/9/14	6/23/15	287	38			2	1.7	8.7	176.5 ↔ 185.2				2	92.8	1.9		10.8	0.0		69.1	0.0		100%
9565	Burbot	Middle/Lower US of DC	Susitna River PRM 186.8	9/9/14	4/23/15	226	608	2	1	1	2.2	0.9	186.3 ↔ 187.2	3 ↕			1	74.0	2.2		10.7	0.0		75.0	0.0		100%
9191	Burbot	Upper River	Susitna River PRM 206.7	9/19/13	9/23/13	4	4			1	0		206.7 ↔ 206.7				1	62.3	1.7		9.8	0.0		31.0	0.0		100%
9192	Burbot	Upper River	Susitna River PRM 206.7	9/19/13	4/9/14	202	9			3	0.9	0.5	206.2 ↔ 206.7				2	46.9	1.1	1	7.6	3.4		22.7	0.0		100%
9205	Burbot	Upper River	Watana Creek TRM 0.1	9/20/13	12/18/13	89	14			3	2.6	1.9	195.1 ↔ 196.9		Watana Creek	0 ↔ 0.1	2	46.9	1.1	1	7.7	3.3		22.2	0.0		100%
9206	Burbot	Upper River	Watana Creek TRM 0.1	9/21/13	6/24/14	276	9213	2	1	6	4	2	195.1 ↔ 197		Watana Creek	0 ↔ 0.1	2	56.6	0.6	4	8.8	7.5		33.8	0.0		100%
9209	Burbot	Upper River	Susitna River PRM 215.2	9/21/13	5/20/14	241	21			4	0.9	6.1	214.3 ↔ 220.4				4	65.2	1.8		9.9	0.0		40.8	0.0		100%
9222	Burbot	Upper River	Watana Creek TRM 0.1	9/23/13	6/23/15	638	149			15	12	23.5	196.8 ↔ 220.2		Watana Creek	0 ↔ 0.1	13	67.5	1.6	2	9.3	1.8		48.1	0.0		100%
9224	Burbot	Upper River	Susitna River PRM 196.4	9/23/13	4/23/15	577	1207	8	1	19	39.9	3.2	193.8 ↔ 197				11	54.9	1.1	8	8.9	4.8		38.1	0.0		100%
9304	Burbot	Upper River	Susitna River PRM 203.5	6/2/14	7/10/14	38	43			4	0.5	0.3	203.4 ↔ 203.7				1	59.1	0.5	3	9.4	8.9		42.1	0.0		100%
9309	Burbot	Upper River	Watana Creek TRM 0.1	6/3/14	5/20/15	351	95			16	10.1	5.1	191.9 ↔ 196.9		Watana Creek	0 ↔ 0.1	15	54.7	1.7	1	8.7	0.7		35.9	0.0		100%
9310	Burbot	Upper River	Watana Creek TRM 0.1	6/3/14	6/28/14	25	25			5	21.3	21.3	175.7 ↔ 196.9	1 ↓	Watana Creek	0 ↔ 0.1	4	49.7	1.3	1	7.4	2.2		24.6	0.0		100%
9329	Burbot	Upper River	Watana Creek TRM 0.1	6/5/14	9/5/14	92	300	3	1	11	17.2	3.4	193.7 ↔ 197		Watana Creek	0 ↔ 0.1	8	50.8	1.3	3	8.5	2.9		31.6	0.0		100%
9330	Burbot	Upper River	Watana Creek TRM 0.1	6/5/14	11/5/14	153	9019	13	1	14	34.3	3.8	193.3 ↔ 197		Watana Creek	0 ↔ 0.1	12	52.3	1.7	2	8.8	1.6		39.9	0.0		100%
9331	Burbot	Upper River	Susitna River PRM 203.5	6/5/14	9/5/14	92	130			12	4.4	1.4	202.1 ↔ 203.5				9	48.1	1.4	3	8.4	2.8		35.5	0.0		100%
9332	Burbot	Upper River	Susitna River PRM 203.5	6/5/14	10/14/14	131	37796	7	1	13	23.2	9.2	194.3 ↔ 203.5				7	53.5	1.0	6	8.8	5.2		36.8	0.0		100%
9336	Burbot	Upper River	Susitna River PRM 206.7	6/5/14	10/2/14	119	100	1	1	13	8.5	3.2	206 ↔ 209.2				12	52.0	1.8	1	8.7	0.9		41.1	0.0		100%
9343	Burbot	Upper River	Watana Creek TRM 0.1	6/6/14	6/23/15	382	75860	13	1	17	19.3	4.6	195.8 ↔ 200.3		Watana Creek	0 ↔ 0.1	7	57.3	0.7	10	8.7	6.9		35.8	0.0		100%
9351	Burbot	Upper River	Susitna River PRM 203.5	6/6/14	4/14/15	312	81			14	7.7	2.7	202.6 ↔ 205		Unnamed 203.4	0 ↔ 0.3	7	55.4	1.0	6	8.9	5.1	1	42.7	0.2		100%
9352	Burbot	Upper River	Susitna River PRM 203.5	6/6/14	6/23/15	382	121			17	3.4	0.9	203.4 ↔ 204.3				8	61.4	0.9	9	9.3	6.5		43.5	0.0		100%
9373	Burbot	Upper River	Susitna River PRM 196.4	6/7/14	6/23/15	381	51313	12	1	14	20.1	6.5	195.4 ↔ 201.8		Watana Creek	0 ↔ 0.1	13	55.7	1.7	1	8.7	0.8		35.4	0.0		100%
9378	Burbot	Upper River	Susitna River PRM 211	6/8/14	2/19/15	256	78	1	1	9	5.3	2.2	209.2 ↔ 211.4				1	58.4	0.2	8	8.8	11.6		47.2	0.0		100%
9379	Burbot	Upper River	Susitna River PRM 211	6/8/14	8/30/14	84	490	7	1	9	30.2	6.1	209.2 ↔ 215.3				4	61.0	0.8	5	8.8	7.0		41.2	0.0		100%
9511	Burbot	Upper River	Susitna River PRM 247.3	9/3/14	11/4/14	62	9			1	0.1	0.1	247.3 ↔ 247.3		Tyone River	0 ↔ 0.1		74.0	0.0	1	10.7	14.9		75.0	0.0		0%
9512	Burbot	Upper River	Susitna River PRM 247.3	9/3/14	6/23/15	293	43			4	1.8	1.4	245.9 ↔ 247.3				3	84.8	1.3	1	10.0	3.7		53.3	0.0		0%
9514	Burbot	Upper River	Susitna River PRM 247.3	9/3/14	6/23/15	293	25			4	3.2	3	244.3 ↔ 247.3				4	84.8	1.7		10.0	0.0		53.3	0.0		0%
9515	Burbot	Upper River	Susitna River PRM 247.3	9/3/14	9/17/14	14	6			1	1.2	1.2	247.3 ↔ 247.3		Tyone River	0 ↔ 1.2		74.0	0.0		10.7	0.0	1	75.0	2.1		0%
9516	Burbot	Upper River	Susitna River PRM 247.3	9/3/14	9/3/14	0																					
9517	Burbot	Upper River	Susitna River PRM 232.4	9/3/14	6/23/15	293	26696	2	1	5	6	14.9	220.3 ↔ 235.2				5	80.3	1.8		9.8	0.0		52.9	0.0		80%
9518	Burbot	Upper River	Susitna River PRM 232.4	9/3/14	3/25/15	203	8			2	0.4	0.2	232.2 ↔ 232.4				2	68.2	2.1		10.1	0.0		63.2	0.0		100%
9519	Burbot	Upper River	Susitna River PRM 211.1	9/4/14	6/23/15	292	436	2	1	5	5.7	7.4	209.2 ↔ 216.6				3	80.3	1.1	2	9.8	5.8		52.9	0.0		100%
9520	Burbot	Upper River	Susitna River PRM 210.3	9/4/14	6/23/15	292	20747	3	1	5	6.2	12.3	198 ↔ 210.3				5	80.3	1.8		9.8	0.0		52.9	0.0		100%
9521	Burbot	Upper River	Susitna River PRM 210.3	9/4/14	10/2/14	28	949	3	1	2	4.9	1.1	209.2 ↔ 210.3				2	68.2	2.1		10.1	0.0		63.2	0.0		100%
9522	Burbot	Upper River	Susitna River PRM 210.3	9/4/14	11/4/14	61	41459	3	1	2	2.1	1.1	209.2 ↔ 210.3				1	68.2	1.0	1	10.1	7.0		63.2	0.0		100%
9523	Burbot	Upper River	Susitna River PRM 210.3	9/4/14	4/23/15	231	2589	3	1	2	5.7	1.3	209.2 ↔ 210.5				2	68.2	2.1		10.1	0.0		63.2	0.0		100%

Table A-4. Tag summary for individual fish during the foraging season (Page 5 of 9).

																Foraging Season										
Tag ID	Species	Tagging Segment	Release Location	Release Date	Last Live Date	Days Active	Total Detections	Fixed Station Events	# Fixed Stations Detected	# Aerial Surveys Detected	Distance Traveled (RM)	Linear Home Range (mi)	Mainstem Range (PRM)	Movments Past Dam Site	Tributaries & Lakes	Tributary Range (TRM)	Mainstem Aerial Detections	Ave Mainstem Survey Length (mi)	Mainstem Selection Ratio	Confluence Areal Detections	Ave Confluence Survey Length (mi)	Confluence Selection Ratio	Tributary Aerial Detections	Ave Tributary Survey Length (mi)	Tributary Selection Ratio	Lake Aerial Detections	% Aerial Detections in ZHI
9539	Burbot	Upper River	Watana Creek TRM 0.1	9/6/14	6/23/15	290	57713	2	1	4	2.3	2.1	195 ↔ 197		Watana Creek	0 ↔ 0.1		84.8	0.0	4	10.0	14.9		53.3	0.0		100%
9541	Burbot	Upper River	Susitna River PRM 192.7	9/6/14	6/23/15	290	28			3	2.5	2.3	190.4 ↔ 192.7				3	88.3	1.6		9.7	0.0		46.0	0.0		100%
9546	Burbot	Upper River	Susitna River PRM 192.7	9/7/14	6/23/15	289	36			4	0.2	2.5	190.3 ↔ 192.8				4	84.8	1.7		10.0	0.0		53.3	0.0		100%
9547	Burbot	Upper River	Susitna River PRM 194.3	9/7/14	9/27/14	20	158	1	1		2.7	2.7	194.3 ↔ 197														
9548	Burbot	Upper River	Watana Creek TRM 0.1	9/7/14	5/20/15	255	3915	2	1	2	3.4	1.8	195.3 ↔ 197		Watana Creek	0 ↔ 0.1	2	76.7	1.6		9.1	0.0		37.5	0.0		100%
9549	Burbot	Upper River	Watana Creek TRM 0.1	9/7/14	10/2/14	25	30661	2	1	1	1	0.5	196.6 ↔ 197		Watana Creek	0 ↔ 0.1		74.0	0.0	1	10.7	14.9		75.0	0.0		100%
9554	Burbot	Upper River	Susitna River PRM 198.9	9/7/14	6/23/15	289	25			3	0.3	0.3	198.6 ↔ 198.9				3	86.5	1.9		10.8	0.0		71.0	0.0		100%
9031	Dolly Varden	Middle/Lower DS of DC	Susitna River PRM 124.2	6/17/13	11/15/13	151	54	2	1	9	26.1	21.8	124.2 ↔ 142.1		Indian River	0 ↔ 3.9	2	33.8	0.5		5.1	0.0	7	35.3	1.6		22%
9060	Dolly Varden	Middle/Lower DS of DC	Talkeetna River TRM 6.3	7/14/13	7/15/13	1	2			1	0.1	0.1			Talkeetna River	6.3 ↔ 6.4		28.2	0.0		3.3	0.0	1	3.7	9.5		0%
9064	Dolly Varden	Middle/Lower DS of DC	Talkeetna River TRM 6.3	7/14/13	7/19/14	370	43			7	4.2	2.3			Talkeetna River	4 ↔ 6.3		51.4	0.0		7.5	0.0	7	36.9	2.6		0%
9065	Dolly Varden	Middle/Lower DS of DC	Talkeetna River TRM 6.3	7/14/13	7/24/13	10	17			3	0.8	0.8			Talkeetna River	5.5 ↔ 6.3		47.1	0.0		6.0	0.0	3	17.2	4.1		0%
9066	Dolly Varden	Middle/Lower DS of DC	Talkeetna River TRM 5.9	7/14/13	7/24/13	10	11			3	3	2			Talkeetna River	4.9 ↔ 6.9		47.1	0.0		6.0	0.0	3	17.2	4.1		0%
9067	Dolly Varden	Middle/Lower DS of DC	Talkeetna River TRM 5.9	7/14/13	9/20/13	68	45			6	35.2	24.5	80.9 ↔ 100.5		Montana Creek, Talkeetna River	0 ↔ 10.5		52.5	0.0	3	6.9	5.4	3	15.1	2.5		50%
9072	Dolly Varden	Middle/Lower DS of DC	Talkeetna River TRM 5.9	7/14/13	6/4/14	325	61	1	1	2	6.3	6.3			Talkeetna River	4.4 ↔ 6.3		47.0	0.0		5.6	0.0	2	5.7	10.2		0%
9145	Dolly Varden	Middle/Lower DS of DC	Susitna River PRM 124.2	8/8/13	8/15/13	6	69	1	1	2	19.1	19.1	105.1 ↔ 124.2				2	41.2	2.6		6.1	0.0		59.2	0.0		100%
9157	Dolly Varden	Middle/Lower DS of DC	Susitna River PRM 142	8/18/13	9/1/13	14	2326	6	3	4	23.7	15.4	134.3 ↔ 149.7				4	32.6	2.6		4.8	0.0		48.8	0.0		100%
9005	Humpback Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/13/13	6/13/13	0																					
9042	Humpback Whitefish	Middle/Lower DS of DC	Susitna River PRM 107	6/21/13	6/28/13	7	1035	1	1	1	33.4	33.4	73.6 ↔ 107				1	110.3	1.2		13.7	0.0		13.0	0.0		0%
9048	Humpback Whitefish	Middle/Lower DS of DC	Susitna River PRM 107	6/21/13	7/10/13	19	70	1	1	3	39.3	20.5	87.6 ↔ 107.4		Rabideux Creek	0 ↔ 0.7	1	84.1	0.4	1	8.3	4.1	1	8.7	3.9		67%
9112	Humpback Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	7/21/13	8/31/13	41	47	1	1	6	21.7	19.8	105.1 ↔ 124.2		Whiskers Creek	0 ↔ 0.7	5	43.3	1.7		6.2	0.0	1	38.2	0.4		100%
9116	Humpback Whitefish	Middle/Lower DS of DC	Susitna River PRM 152.3	7/23/13	8/5/13	13	23			2	4.2	4.2	148.1 ↔ 152.3				1	29.8	1.1	1	4.2	8.2		34.0	0.0		100%
9117	Humpback Whitefish	Middle/Lower DS of DC	Susitna River PRM 152.3	7/23/13	8/9/13	17	758	4	4	15	59	57.1	95.5 ↔ 152.6				2	27.1	0.2	13	3.7	11.0		16.6	0.0		100%
9138	Humpback Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	7/24/13	8/12/13	18	206	3	1	3	33.3	25.2	103.7 ↔ 128.9				3	57.7	1.6		7.9	0.0		25.0	0.0		100%
9530	Lake Trout	Upper River	Tsisi Lake 1	9/5/14	5/20/15	257	14			1					Tsisi Lake 1			79.4	0.0		7.5	0.0				1	0%
9531	Lake Trout	Upper River	Tsisi Lake 1	9/5/14	6/4/15	272	16			2	0.4				Tsisi Lake 1			86.1	0.0		9.2	0.0		39.4	0.0	2	0%
9532	Lake Trout	Upper River	Tsisi Lake 1	9/5/14	6/4/15	272	19			2	0.1				Tsisi Lake 1			86.1	0.0		9.2	0.0		39.4	0.0	2	0%
9533	Lake Trout	Upper River	Tsisi Lake 1	9/5/14	6/4/15	272	20			2	0.4				Tsisi Lake 1			86.1	0.0		9.2	0.0		39.4	0.0	2	0%
9534	Lake Trout	Upper River	Tsisi Lake 1	9/5/14	6/4/15	272	33			2	0.1				Tsisi Lake 1			86.1	0.0		9.2	0.0		39.4	0.0	2	0%
9535	Lake Trout	Upper River	Tsisi Lake 1	9/5/14	6/4/15	272	51			2	0.4				Tsisi Lake 1			86.1	0.0		9.2	0.0		39.4	0.0	2	0%
9536	Lake Trout	Upper River	Tsisi Lake 1	9/5/14	6/4/15	272	28			2	0.2				Tsisi Lake 1			86.1	0.0		9.2	0.0		39.4	0.0	2	0%
9537	Lake Trout	Upper River	Tsisi Lake 1	9/5/14	6/4/15	272	23			2	0				Tsisi Lake 1			86.1	0.0		9.2	0.0		39.4	0.0	2	0%
9538	Lake Trout	Upper River	Tsisi Lake 1	9/5/14	6/4/15	272	32			2	0.7				Tsisi Lake 1			86.1	0.0		9.2	0.0		39.4	0.0	2	0%
9566	Lake Trout	Upper River	Sally Lake	9/9/14	6/4/15	268	15			1					Sally Lake			92.8	0.0		10.8	0.0		78.7	0.0	1	100%
9567	Lake Trout	Upper River	Tsisi Lake 1	9/9/14	6/4/15	268	19			2	0.3				Tsisi Lake 1			86.1	0.0		9.2	0.0		39.4	0.0	2	0%
9568	Lake Trout	Upper River	Tsisi Lake 1	9/9/14	11/4/14	56	1								Tsisi Lake 1												
9006	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 124.2	6/14/13	6/14/13	0																					
9028	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 124.2	6/17/13	8/27/14	436	14400	16	3	46	53.3	25.3	120.4 ↔ 145.6		Indian River	0 ↔ 0.1	37	52.4	1.5	9	7.2	2.7		39.7	0.0		100%
9032	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 124.2	6/17/13	9/7/13	82	52			13	35.9	32.5	92.7 ↔ 125.2				13	49.7	1.7		6.7	0.0		29.2	0.0		100%
9035	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 124.2	6/18/13	7/3/13	15	318	3	2	2	38.5	38.3	85.9 ↔ 124.2				2	100.2	1.2		12.3	0.0		12.0	0.0		100%
9036	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 124.2	6/18/13	8/16/13	59	179	1	1	7	39.9	34.2	94.1 ↔ 128.3				7	54.3	1.7		7.3	0.0		30.9	0.0		100%
9037	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 107	6/20/13	9/21/13	93	11706	11	2	15	34.5	13.9	102.9 ↔ 116.8				11	56.3	1.2	4	7.1	3.5		30.9	0.0		100%
9038	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 107	6/20/13	7/15/13	25	14			4	2.8	1.5	106.8 ↔ 108.3				4	55.0	1.3		7.0	0.0		11.8	0.0		100%
9039	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 107	6/20/13	6/24/13	4	187	2	1	1	3.5	2.7	104.3 ↔ 107				1	47.4	1.4		6.1	0.0		11.8	0.0		100%
9043	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 107	6/21/13	7/3/13	12	5			1	2.4	2.4	104.6 ↔ 107				1	90.0	1.2		10.8	0.0		10.9	0.0		100%
9044	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 107	6/21/13	6/28/13	7	3308	1	1	2	11.4	11.4	95.6 ↔ 107				2	78.9	1.3		9.9	0.0		12.4	0.0		100%
9045	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 107	6/21/13	6/28/13	6	440	1	1		1.9	1.9	105.1 ↔ 107														
9046	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 107	6/21/13	7/25/13	34	47	1	1	3	6.9	6.6	100.5 ↔ 107		Talkeetna River	0 ↔ 0.1	1	47.1	0.4	2	5.7	7.0		7.2	0.0		100%
9049	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 107	6/21/13	6/26/13	5	11	1	1		1.9	1.9	105.1 ↔ 107														
9068	Longnose Sucker	Middle/Lower DS of DC	Talkeetna River TRM 5.9	7/14/13	8/2/13	19	29			4	0.2	0.2			Talkeetna River	5.7 ↔ 5.9		38.9	0.0		5.1	0.0	4	25.7	2.7		0%
9070	Longnose Sucker	Middle/Lower DS of DC	Talkeetna River TRM 5.9	7/14/13	7/24/13	10	18			3	2.3	1.5			Talkeetna River	4.4 ↔ 5.9		47.1	0.0		6.0	0.0	3	17.2	4.1		0%

Table A-4. Tag summary for individual fish during the foraging season (Page 6 of 9).

																Foraging Season										
Tag ID	Species	Tagging Segment	Release Location	Release Date	Last Live Date	Days Active	Total Detections	Fixed Station Events	# Fixed Stations Detected	# Aerial Surveys Detected	Distance Traveled (RM)	Linear Home Range (mi)	Mainstem Range (PRM)	Movments Past Dam Site	Tributaries & Lakes	Tributary Range (TRM)	Mainstem Aerial Detections	Ave Mainstem Survey Length (mi)	Mainstem Selection Ratio	Confluence Areal Detections	Ave Confluence Survey Length (mi)	Confluence Selection Ratio	Tributary Aerial Detections	Ave Tributary Survey Length (mi)	Tributary Selection Ratio	Lake Aerial Detections	% Aerial Detections in ZHI
9073	Longnose Sucker	Middle/Lower DS of DC	Talkeetna River TRM 5.9	7/14/13	7/25/13	11	9			2	5.9	5.9	100.5 ↔ 100.5		Talkeetna River	0 ↔ 5.9	1	47.0	0.6		5.6	0.0	1	5.0	5.8		0%
9074	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 107	7/15/13	7/19/13	4	96	1	1	1	1.9	1.9	105.1 ↔ 107				1	28.2	1.2		3.3	0.0		3.7	0.0		100%
9118	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 152.3	7/23/13	8/1/13	9	48	2	2	6	10.8	10.3	142.1 ↔ 152.4				3	42.5	0.8	3	5.6	6.2		21.2	0.0		100%
9134	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 142.3	7/25/13	8/28/13	34	1000	6	1	10	13.8	5.3	137 ↔ 142.3				8	37.6	1.8	2	5.3	3.1		39.6	0.0		100%
9135	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 142.3	7/25/13	8/1/13	7	1723	3	1	2	0.6	0.2	142.1 ↔ 142.3					29.8	0.0	2	3.8	12.3		12.7	0.0		100%
9137	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 142.3	7/26/13	8/10/13	15	1638	3	2	4	27.4	27	115.3 ↔ 142.3				3	35.5	1.6	1	4.9	3.9		35.5	0.0		100%
9156	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 142	8/18/13	8/30/13	12	39	2	2	4	46.6	46.5	95.6 ↔ 142.1				3	45.8	1.4	1	6.4	3.4		35.0	0.0		100%
9158	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 142	8/18/13	1/28/14	163	201	4	1	8	4.8	1.5	140.9 ↔ 142.4				8	42.4	2.3		6.4	0.0		47.5	0.0		100%
9160	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 117.5	8/18/13	4/8/14	233	738	9	2	11	22.8	13.1	105.1 ↔ 118.2				5	48.6	1.0	6	7.2	7.8		47.5	0.0		100%
9161	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 113.8	8/19/13	12/18/13	121	105			9	1.9	1.4	113.7 ↔ 115.1				5	50.3	1.1	4	7.4	6.2		45.2	0.0		100%
9162	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 113.8	8/19/13	8/30/13	11	95	1	1	4	17.3	17.3	96.5 ↔ 113.8				4	45.8	1.9		6.4	0.0		35.0	0.0		100%
9165	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 142.3	8/29/13	9/4/13	6	126	2	2	2	25.5	25.5	116.8 ↔ 142.3				2	47.4	2.2		7.0	0.0		50.8	0.0		100%
9167	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 142	9/18/13	12/3/13	76	1245	1	1	4	2.7	2.7	142 ↔ 144.7				4	49.1	2.0		7.1	0.0		42.4	0.0		100%
9119	Longnose Sucker	Upper River	Tyone River TRM 0.4	7/23/13	7/23/13	0																					
9120	Longnose Sucker	Upper River	Tyone River TRM 0.4	7/23/13	7/23/13	0																					
9121	Longnose Sucker	Upper River	Tyone River TRM 0.4	7/23/13	7/27/13	4	34	3	3	1	102	102	145.7 ↔ 247.3	1 ↓	Tyone River	0 ↔ 0.4	1	8.6	1.5		1.4	0.0		3.0	0.0		100%
9122	Longnose Sucker	Upper River	Tyone River TRM 0.4	7/23/13	8/9/13	17	38	1	1	2	190.8	190.8	56.9 ↔ 247.3	1 ↓	Tyone River	0 ↔ 0.4	2	65.2	1.2		7.1	0.0		6.7	0.0		50%
9123	Longnose Sucker	Upper River	Tyone River TRM 0.4	7/23/13	8/20/13	28	191	2	2	15	96.3	95.5	152.2 ↔ 247.3	1 ↓	Tyone River	0 ↔ 0.4	2	32.3	0.3	13	4.6	11.8		26.2	0.0		100%
9190	Longnose Sucker	Upper River	Susitna River PRM 206.7	9/19/13	9/30/13	11	16			2	2.6	2.6	204.1 ↔ 206.7					62.3	0.0	2	9.7	10.7		31.7	0.0		100%
9195	Longnose Sucker	Upper River	Susitna River PRM 206.7	9/19/13	2/19/15	518	19252	8	1	17	19.2	4	205.2 ↔ 209.2				16	51.8	1.8	1	8.5	0.7		36.3	0.0		100%
9197	Longnose Sucker	Upper River	Susitna River PRM 206.7	9/19/13	11/12/13	54	22			3	1.3	1.1	205.6 ↔ 206.7				3	46.9	1.7		7.7	0.0		24.0	0.0		100%
9199	Longnose Sucker	Upper River	Susitna River PRM 206.7	9/19/13	11/4/14	411	6201	8	1	16	36.6	14	206.1 ↔ 220.1				10	57.2	1.1	6	8.7	4.5		39.1	0.0		100%
9200	Longnose Sucker	Upper River	Susitna River PRM 198.1	9/20/13	7/17/14	300	699	2	1	7	9.1	3.8	194.3 ↔ 198.1				4	49.0	1.0	3	8.2	4.6		30.5	0.0		100%
9339	Longnose Sucker	Upper River	Watana Creek TRM 0.1	6/6/14	6/17/14	11	65	2	2	2	27.6	27.6	103.5 ↔ 131.1				2	69.6	1.2		7.4	0.0		7.0	0.0		100%
9340	Longnose Sucker	Upper River	Watana Creek TRM 0.1	6/6/14	8/7/14	62	6503	7	5	6	105.8	104	96.2 ↔ 200.2	1 ↓			4	63.6	1.1	2	9.3	3.8		33.4	0.0		100%
9341	Longnose Sucker	Upper River	Watana Creek TRM 0.1	6/6/14	7/15/14	39	5217	8	6	5	86.2	80.2	116.8 ↔ 197	1 ↓			5	50.7	1.7		8.1	0.0		28.2	0.0		100%
9342	Longnose Sucker	Upper River	Watana Creek TRM 0.1	6/6/14	7/9/14	33	18582	4	1	5	0.8	0.4	196.8 ↔ 197.1		Watana Creek	0 ↔ 0.1		45.1	0.0	5	7.1	11.2		27.4	0.0		100%
9347	Longnose Sucker	Upper River	Watana Creek TRM 0.1	6/6/14	8/5/14	60	37791	8	2	8	23.8	15.4	187.2 ↔ 202.1		Watana Creek	0 ↔ 0.5	2	45.5	0.5	5	7.8	7.1	1	35.2	0.3		100%
9348	Longnose Sucker	Upper River	Watana Creek TRM 0.1	6/6/14	8/7/14	62	257	6	6	9	101.2	98.8	80.2 ↔ 179	1 ↓			7	75.6	1.2	2	9.2	2.7		28.1	0.0		89%
9354	Longnose Sucker	Upper River	Susitna River PRM 203.5	6/6/14	12/16/14	193	135			13	7.2	1.7	200 ↔ 201.7				13	51.2	2.0		8.6	0.0		40.3	0.0		100%
9356	Longnose Sucker	Upper River	Susitna River PRM 203.5	6/7/14	8/18/14	72	31			8	5.2	2.9	203.6 ↔ 206.5				4	50.3	1.0	4	8.5	6.0		44.3	0.0		100%
9368	Longnose Sucker	Upper River	Susitna River PRM 206.7	6/7/14	11/12/14	158	354	1	1	13	18	11.2	191.1 ↔ 202.3				13	51.2	1.9		8.6	0.0		38.1	0.0		100%
9370	Longnose Sucker	Upper River	Susitna River PRM 206.7	6/7/14	11/4/14	150	10602	3	1	12	17.4	9.1	193.5 ↔ 202.6				11	51.2	1.8	1	8.6	1.0		39.9	0.0		100%
9371	Longnose Sucker	Upper River	Susitna River PRM 206.7	6/7/14	10/2/14	117	20275	9	1	15	24.4	10.9	191.6 ↔ 202.3		Watana Creek	0 ↔ 0.2	12	51.8	1.5	3	8.7	2.3		39.4	0.0		100%
9372	Longnose Sucker	Upper River	Susitna River PRM 206.7	6/7/14	11/4/14	150	153			14	4.9	2.5	200 ↔ 202.5				14	52.8	1.9		8.7	0.0		40.5	0.0		100%
9375	Longnose Sucker	Upper River	Susitna River PRM 196.4	6/7/14	10/14/14	129	1469	7	1	11	27.6	6.4	194 ↔ 200.4				9	51.9	1.5	2	8.6	2.0		35.3	0.0		100%
9376	Longnose Sucker	Upper River	Susitna River PRM 196.4	6/7/14	10/2/14	117	158	1	1	14	13	6.7	190.3 ↔ 197				10	49.8	1.3	4	8.5	3.1		33.6	0.0		100%
9377	Longnose Sucker	Upper River	Susitna River PRM 196.4	6/7/14	12/3/14	179	83734	9	1	15	18.2	5	195.7 ↔ 200.2		Watana Creek	0 ↔ 0.5	11	52.9	1.4	3	8.7	2.3	1	36.9	0.2		100%
9384	Longnose Sucker	Upper River	Watana Creek TRM 0.1	6/8/14	6/4/15	361	1639	5	1	12	17.1	4.5	196.5 ↔ 201				10	48.7	1.6	2	8.3	1.8		34.4	0.0		100%
9388	Longnose Sucker	Upper River	Susitna River PRM 198.9	6/8/14	10/2/14	116	364	1	1	15	15.7	5.6	197 ↔ 202.6				15	51.8	1.9		8.6	0.0		39.2	0.0		100%
9500	Longnose Sucker	Upper River	Susitna River PRM 247.3	9/2/14	12/16/14	105	12			1	0.1	0.1	247.3 ↔ 247.3		Tyone River	0 ↔ 0.1		74.0	0.0	1	10.7	14.9		75.0	0.0		0%
9501	Longnose Sucker	Upper River	Susitna River PRM 247.3	9/2/14	6/23/15	294	15			1			247.3 ↔ 247.3					92.8	0.0	1	10.8	15.1		59.4	0.0		0%
9502	Longnose Sucker	Upper River	Susitna River PRM 247.3	9/2/14	9/2/14	0																					
9503	Longnose Sucker	Upper River	Susitna River PRM 247.3	9/2/14	12/3/14	92	12			1	0.3	0.3	247 ↔ 247.3					74.0	0.0	1	10.7	14.9		75.0	0.0		0%
9504	Longnose Sucker	Upper River	Susitna River PRM 247.3	9/2/14	9/2/14	0																					
9507	Longnose Sucker	Upper River	Susitna River PRM 247	9/2/14	6/23/15	294	11			1			235.2 ↔ 247		Oshetna River	0 ↔ 4.6		92.8	0.0		10.8	0.0	1	59.4	2.7		0%
9508	Longnose Sucker	Upper River	Susitna River PRM 247	9/2/14	9/10/14	7	12	1	1		11.8	11.8	235.2 ↔ 247														
9509	Longnose Sucker	Upper River	Susitna River PRM 247	9/2/14	9/17/14	15	17			1	0.5	0.5	247 ↔ 247.3		Tyone River	0 ↔ 0.2		74.0	0.0	1	10.7	14.9		75.0	0.0		0%
9510	Longnose Sucker	Upper River	Susitna River PRM 247	9/2/14	11/4/14	63	4005	1	1	1	11.8	11.8	235.2 ↔ 247				1	74.0	2.2		10.7	0.0		75.0	0.0		0%
9513	Longnose Sucker	Upper River	Susitna River PRM 247.3	9/3/14	9/3/14	0																					

Table A-4. Tag summary for individual fish during the foraging season (Page 7 of 9).

																Foraging Season										
Tag ID	Species	Tagging Segment	Release Location	Release Date	Last Live Date	Days Active	Total Detections	Fixed Station Events	# Fixed Stations Detected	# Aerial Surveys Detected	Distance Traveled (RM)	Linear Home Range (mi)	Mainstem Range (PRM)	Movments Past Dam Site	Tributaries & Lakes	Tributary Range (TRM)	Mainstem Aerial Detections	Ave Mainstem Survey Length (mi)	Mainstem Selection Ratio	Confluence Areal Detections	Ave Confluence Survey Length (mi)	Confluence Selection Ratio	Tributary Aerial Detections	Ave Tributary Survey Length (mi)	Tributary Selection Ratio	Lake Aerial Detections	% Aerial Detections in ZHI
9525	Longnose Sucker	Upper River	Susitna River PRM 213.6	9/4/14	11/4/14	61	4770	2	1	2	4.4	4.4	209.2 ↔ 213.6					68.2	0.0	2	10.1	14.1		63.2	0.0		100%
9540	Longnose Sucker	Upper River	Watana Creek TRM 0.1	9/6/14	11/5/14	60	4799	1	1		0.2	0.1	196.9 ↔ 196.9		Watana Creek	0 ↔ 0.1											
9542	Longnose Sucker	Upper River	Susitna River PRM 192.7	9/6/14	10/14/14	38	5			1	1.6	1.6	192.7 ↔ 194.3				1	74.0	2.2		10.7	0.0		75.0	0.0		100%
9550	Longnose Sucker	Upper River	Susitna River PRM 198.9	9/7/14	9/22/14	15	240	5	5		41.6	41.6	157.3 ↔ 198.9	1 ↓													
9555	Longnose Sucker	Upper River	Susitna River PRM 198.9	9/7/14	6/23/15	289	9151	1	1	1	1.9	10.9	197 ↔ 207.9				1	92.8	1.8		10.8	0.0		59.4	0.0		100%
9558	Longnose Sucker	Upper River	Susitna River PRM 198.9	9/7/14	6/23/15	289	33			2	0.3	0.3	198.9 ↔ 199.2				2	83.4	1.9		10.8	0.0		67.2	0.0		100%
9559	Longnose Sucker	Upper River	Susitna River PRM 198.9	9/7/14	9/17/14	10	397	2	2	1	36	31.9	167 ↔ 198.9	1 ↓			1	74.0	2.2		10.7	0.0		75.0	0.0		100%
9151	Northern Pike	Middle/Lower DS of DC	Fish Creek (Krotb) TRM 3.3	8/16/13	10/29/14	439	72			17	7.4	2.1			Fish Creek (Krotb)	3.2 ↔ 5.3		85.9	0.0		8.6	0.0	17	27.5	4.4		0%
9152	Northern Pike	Middle/Lower DS of DC	Fish Creek (Krotb) TRM 3.3	8/16/13	5/14/14	271	5			1	30.4	30.4			Fish Creek (Krotb), Yentna River	0 ↔ 25.5		65.8	0.0		8.7	0.0	1	10.4	8.2		0%
9153	Northern Pike	Middle/Lower DS of DC	Fish Creek (Krotb) TRM 3.3	8/16/13	1/7/14	144	1								Fish Creek (Krotb)	3.3 ↔ 3.3											
9154	Northern Pike	Middle/Lower DS of DC	Fish Creek (Krotb) TRM 3.3	8/16/13	8/16/13	0																					
9155	Northern Pike	Middle/Lower DS of DC	Fish Creek (Krotb) TRM 3.3	8/16/13	4/8/14	235	1								Fish Creek (Krotb)	3.3 ↔ 3.3											
9008	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 124.2	6/14/13	9/2/14	445	32790	17	4	34	90.5	38.6	108.7 ↔ 142.1		Indian River	0 ↔ 5.2	9	45.2	0.5	3	6.5	1.3	22	41.5	1.5		35%
9017	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 134.3	6/16/13	8/12/13	57	6074	4	1	6	2.1	1.2	134.2 ↔ 134.6		Fourth of July Creek	0 ↔ 0.8	1	43.1	0.3	2	6.2	4.8	3	38.9	1.1		50%
9018	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 134.3	6/16/13	4/30/14	318	7141	8	1	15	6.9	2.5	133.4 ↔ 134.7		Fourth of July Creek	0 ↔ 1.2	4	49.4	0.5	7	7.1	6.5	4	42.6	0.6		67%
9019	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 134.3	6/16/13	9/3/13	79	3098	7	1	12	7.8	3.5	132.3 ↔ 134.9		Fourth of July Creek	0 ↔ 0.9	2	41.1	0.4	4	5.9	5.1	6	43.1	1.0		42%
9021	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 124.2	6/16/13	4/30/14	318	1973	8	1	15	8.8	1.8	134.1 ↔ 134.4		Fourth of July Creek, Sherman Creek	0 ↔ 1.4	1	47.5	0.1	7	6.9	6.7	7	45.7	1.0		40%
9022	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 124.2	6/16/13	9/3/13	79	6120	11	6	14	81.7	40.3	105.1 ↔ 142.3		Indian River	0 ↔ 3.1	1	33.1	0.2	3	4.9	3.7	10	46.2	1.3		29%
9026	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 124.2	6/17/13	7/30/13	43	2165	3	2	5	13.9	11	127.3 ↔ 136.9		Fourth of July Creek	0 ↔ 1.4	2	50.7	0.6	1	6.6	2.5	2	24.6	1.3		60%
9040	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 124.2	6/20/13	4/8/14	292	364	3	2	15	33.5	16.3	135.3 ↔ 142.1		Indian River	0 ↔ 9.5	4	41.2	0.6	2	6.1	2.0	9	45.3	1.2		33%
9041	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 124.2	6/21/13	8/25/13	65	545	2	2	8	14.3	13.1	130.2 ↔ 142.1		Indian River	0 ↔ 1.2	1	38.5	0.3		5.5	0.0	7	40.3	1.8		13%
9051	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 124.2	6/24/13	5/21/14	331	61			14	23.5	18.5	109.1 ↔ 127.6				6	47.9	0.9	8	6.8	8.4		45.1	0.0		100%
9052	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 124.2	6/25/13	7/24/13	29	179	4	3	2	41.9	25.3	116.8 ↔ 142.1				1	34.4	1.0	1	4.6	7.8		32.4	0.0		100%
9054	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 134.3	7/9/13	9/21/14	439	3242	6	1	45	27.2	4.5	131.2 ↔ 134.5		Fourth of July Creek	0 ↔ 1.2	9	51.3	0.4	16	7.3	5.0	20	43.9	1.0		56%
9055	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 134.3	7/9/13	9/8/13	61	4725	10	1	11	68.1	64.6	70.9 ↔ 134.5		Fourth of July Creek, Sherman Creek	0 ↔ 0.7	1	41.4	0.2	7	5.7	9.4	3	37.5	0.6		45%
9056	Rainbow Trout	Middle/Lower DS of DC	Talkeetna River TRM 6.3	7/14/13	9/30/14	443	24			8	0.8	0.4			Talkeetna River	6.3 ↔ 6.7		59.4	0.0		8.4	0.0	8	57.6	2.2		0%
9057	Rainbow Trout	Middle/Lower DS of DC	Talkeetna River TRM 6.3	7/14/13	8/23/13	40	13			3	5.1	5.1			Talkeetna River	1.2 ↔ 6.3		52.3	0.0		6.6	0.0	3	6.9	9.5		0%
9058	Rainbow Trout	Middle/Lower DS of DC	Talkeetna River TRM 6.3	7/14/13	8/2/13	19	16			3	0.6	0.5			Talkeetna River	6.3 ↔ 6.8		29.9	0.0		4.2	0.0	3	31.6	2.1		0%
9059	Rainbow Trout	Middle/Lower DS of DC	Talkeetna River TRM 6.3	7/14/13	8/9/13	26	24			3	6.6	6.4	100.5 ↔ 100.5		Talkeetna River	0 ↔ 6.4		57.4	0.0	1	7.2	3.3	2	6.9	6.9		33%
9061	Rainbow Trout	Middle/Lower DS of DC	Talkeetna River TRM 6.3	7/14/13	8/19/14	401	115			17	26.6	15.1	92.3 ↔ 100.5		Birch Creek, Talkeetna River	0 ↔ 6.3	9	74.3	0.8	4	9.7	2.8	4	31.8	0.9		82%
9062	Rainbow Trout	Middle/Lower DS of DC	Talkeetna River TRM 6.3	7/14/13	8/2/13	19	23			4	0.8	0.4			Talkeetna River	5.9 ↔ 6.3		38.9	0.0		5.1	0.0	4	25.7	2.7		0%
9063	Rainbow Trout	Middle/Lower DS of DC	Talkeetna River TRM 6.3	7/14/13	8/30/13	47	20			4	50	6.3	100.5 ↔ 100.5		Talkeetna River	0 ↔ 6.3	1	51.8	0.4		6.7	0.0	3	15.5	3.6		0%
9071	Rainbow Trout	Middle/Lower DS of DC	Talkeetna River TRM 5.9	7/14/13	7/24/13	10	6			1	8	8			Talkeetna River	5.9 ↔ 13.9		47.4	0.0		6.9	0.0	1	40.2	2.4		0%
9075	Rainbow Trout	Middle/Lower DS of DC	Montana Creek TRM 2.3	7/15/13	8/23/13	39	1089	3	1	5	39.7	3.3	80.9 ↔ 80.9		Montana Creek	0 ↔ 3.3	1	68.0	0.3		8.7	0.0	4	8.6	8.0		0%
9076	Rainbow Trout	Middle/Lower DS of DC	Montana Creek TRM 2.3	7/15/13	8/1/13	17	3199	3	1	3	7.8	1.7			Montana Creek	0.7 ↔ 2.4		66.3	0.0		8.1	0.0	3	8.0	10.3		0%
9077	Rainbow Trout	Middle/Lower DS of DC	Montana Creek TRM 2.3	7/15/13	8/9/13	25	11744	3	1	3	7.5	1.6			Montana Creek	0.7 ↔ 2.3		70.4	0.0		9.1	0.0	3	9.1	9.7		0%
9078	Rainbow Trout	Middle/Lower DS of DC	Montana Creek TRM 2.3	7/15/13	8/9/13	25	2020	2	1	2	7.8	2.8			Montana Creek	0.7 ↔ 3.5		72.1	0.0		9.2	0.0	2	8.6	10.5		0%
9079	Rainbow Trout	Middle/Lower DS of DC	Montana Creek TRM 2.3	7/15/13	2/4/15	569	7096	3	1	30	22.2	4.8	80.9 ↔ 83.1		Montana Creek	0 ↔ 2.6	5	84.0	0.2		9.8	0.0	25	25.7	3.9		20%
9080	Rainbow Trout	Middle/Lower DS of DC	Montana Creek TRM 2.3	7/15/13	8/17/13	33	13232	5	1	4	16.8	2.3			Montana Creek	0.7 ↔ 3		69.3	0.0		8.8	0.0	4	8.4	10.3		0%
9133	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 142	7/25/13	8/31/13	37	5039	13	3	12	17.4	11.9	130.2 ↔ 142.1				8	36.4	1.5	4	5.2	5.2		40.2	0.0		100%
9146	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 124.2	8/16/13	8/29/13	13	84	2	2	4	25.3	22.2	105.1 ↔ 127.3				1	38.1	0.6	3	5.5	12.4		46.8	0.0		100%
9159	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 142	8/18/13	8/31/13	13	76	1	1	4	37.3	36.9	105.2 ↔ 142.1				3	41.2	1.7	1	5.9	3.9		45.1	0.0		100%
9166	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 142.3	8/29/13	11/3/13	66	518	5	1	7	9.8	4.6	141.8 ↔ 146.2		Indian River	0 ↔ 0.2	5	52.9	1.5	2	7.9	3.9		47.8	0.0		86%
9168	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 142	9/18/13	9/24/13	6	989	2	2	1	9.3	9.2	132.9 ↔ 142.1				1	47.4	2.1		6.9	0.0		45.5	0.0		100%
9169	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 142	9/18/13	9/24/13	6	231	2	2	1	10.7	10.6	131.5 ↔ 142.1				1	47.4	2.1		6.9	0.0		45.5	0.0		100%
9228	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 134.3	9/25/13	7/14/14	292	56			7	3.8	3.2	134.2 ↔ 137.1		Fourth of July Creek	0 ↔ 0.3	1	51.8	0.3	5	7.4	9.4	1	38.1	0.4		86%
9237	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 142	9/25/13	4/23/15	575	1248	3	1	27	13.8	5.9	141.8 ↔ 142.1		Indian River	0 ↔ 5.6	1	44.9	0.1		6.3	0.0	26	44.6	2.1		4%
9238	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 142	9/25/13	6/3/15	616	10255	10	1	29	43.3	9.7	134.3 ↔ 142.3		Fourth of July Creek, Indian River	0 ↔ 1.4	8	46.0	0.6	7	6.7	3.6	14	47.1	1.0		48%
9239	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 142	9/25/13	7/6/15	649	3096	5	1	18	17.7	13.1	142 ↔ 142.1		Indian River	0 ↔ 13		47.6	0.0	3	7.1	2.4	15	47.2	1.8		17%
9242	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 80.9	9/27/13	2/4/15	495	222			17	16	7	80.2 ↔ 81.2		Montana Creek	0 ↔ 6	5	84.8	0.5	11	9.5	9.0	1	38.0	0.2		47%

Table A-4. Tag summary for individual fish during the foraging season (Page 8 of 9).

																Foraging Season										
Tag ID	Species	Tagging Segment	Release Location	Release Date	Last Live Date	Days Active	Total Detections	Fixed Station Events	# Fixed Stations Detected	# Aerial Surveys Detected	Distance Traveled (RM)	Linear Home Range (mi)	Mainstem Range (PRM)	Movments Past Dam Site	Tributaries & Lakes	Tributary Range (TRM)	Mainstem Aerial Detections	Ave Mainstem Survey Length (mi)	Mainstem Selection Ratio	Confluence Areal Detections	Ave Confluence Survey Length (mi)	Confluence Selection Ratio	Tributary Aerial Detections	Ave Tributary Survey Length (mi)	Tributary Selection Ratio	Lake Aerial Detections	% Aerial Detections in ZHI
9243	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 80.9	9/27/13	7/6/15	647	92			13	29.2	22.6	80.9 ↔ 98.6		Montana Creek	0 ↔ 4.9	1	82.8	0.1	2	9.6	2.2	10	43.4	2.4		8%
9244	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 80.9	9/28/13	8/19/14	325	19			3	3.7	3.7	80.9 ↔ 80.9		Willow Creek	3.6 ↔ 3.7		73.1	0.0		8.3	0.0	3	32.7	3.5		0%
9247	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 80.9	9/28/13	10/29/14	396	134			17	50.6	30	53.6 ↔ 80.9		Goose Creek (LR), Kashwitna River	0 ↔ 1.4	7	86.5	0.7	5	9.7	4.2	5	41.7	1.0		0%
9248	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 80.9	9/28/13	8/22/14	328	41			4	4.3	4.2	79.1 ↔ 80.9		Montana Creek	0 ↔ 2.4	2	90.4	0.8	1	10.5	3.5	1	44.4	0.8		25%
9249	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 80.9	9/28/13	12/17/14	445	111			10	5	4.1	80.6 ↔ 82		Montana Creek	0 ↔ 2.7	2	88.3	0.3	5	10.4	6.8	3	42.7	1.0		60%
9250	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 80.9	9/28/13	8/28/14	334	43			5	10.9	10.9	80.5 ↔ 86.3		Montana Creek	4.4 ↔ 5.1	3	68.1	1.1		8.9	0.0	2	48.7	1.0		40%
9009	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/14/13	6/26/13	12	15	1	1	1	21.3	20.2	105.1 ↔ 125.3				1	47.4	1.4		6.1	0.0		11.8	0.0		100%
9011	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/14/13	5/24/14	343	2006	5	3	5	63	30	100.5 ↔ 124.2		Talkeetna River	0 ↔ 6.3	2	38.1	0.7		5.2	0.0	3	25.8	1.6		40%
9012	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/14/13	9/20/13	98	8			3	69.4	69.4	54.8 ↔ 124.2				3	66.8	1.2		8.6	0.0		6.9	0.0		33%
9013	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/15/13	12/3/13	171	360	5	4	17	77.1	43.7	124.2 ↔ 152.3		Portage Creek	0 ↔ 15.6	4	37.1	0.5	1	5.4	0.9	12	43.4	1.4		29%
9023	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/16/13	9/8/13	84	22	2	2	2	92.2	92.2	32.4 ↔ 124.2		Yentna River	0 ↔ 0.4	1	77.1	0.6		9.3	0.0	1	7.5	6.3		50%
9024	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/16/13	10/2/13	108	221	1	1	13	81.4	61.7	67.2 ↔ 128.9				11	49.6	1.7	2	7.1	2.1		40.6	0.0		85%
9025	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/16/13	2/18/14	247	3955	7	4	14	65.7	41	124.2 ↔ 152.3		Portage Creek	0 ↔ 12.9	3	44.5	0.4	2	6.2	2.0	9	37.7	1.5		36%
9027	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/17/13	9/13/13	88	84	2	1	14	47.1	33.1	102.2 ↔ 134.3		Chulitna River, Fourth of July Creek	0 ↔ 0.7	10	42.2	1.5	2	5.9	2.1	2	39.9	0.3		93%
9030	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/17/13	10/9/13	114	3433	4	1	11	34.2	27	97.2 ↔ 124.2				10	45.5	1.7	1	6.3	1.2		30.8	0.0		100%
9033	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/18/13	9/3/13	77	7204	7	5	18	57.1	37.2	105.1 ↔ 142.1		Gold Creek	0 ↔ 0.2	7	39.0	0.8	11	5.4	9.3		37.3	0.0		89%
9034	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/18/13	9/20/13	94	485	4	4	19	50.3	34	105.1 ↔ 139.1				19	49.3	1.9		6.8	0.0		37.2	0.0		100%
9053	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	7/7/13	8/17/14	406	75	1	1	17	31.3	75.3	49.7 ↔ 125				17	62.6	1.7		7.4	0.0		36.3	0.0		53%
9069	Round Whitefish	Middle/Lower DS of DC	Talkeetna River TRM 5.9	7/14/13	8/16/13	33	12			3	53.8	9.6	100.5 ↔ 100.5		Talkeetna River	0 ↔ 9.6	1	46.6	0.6		6.6	0.0	2	35.5	1.7		0%
9136	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 142.3	7/26/13	7/31/13	5	975	3	2	3	8.6	8	134.3 ↔ 142.3				3	31.5	1.6		4.0	0.0		13.6	0.0		100%
9229	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 134.3	9/25/13	4/8/14	195	1						134.3 ↔ 134.3														
9230	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 134.3	9/25/13	2/19/14	147	1						134.3 ↔ 134.3														
9231	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 134.3	9/25/13	5/30/14	247	477	1	1	1	7.7	17.5	116.8 ↔ 134.3				1	35.3	1.8		5.9	0.0		21.1	0.0		100%
9232	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 134.3	9/25/13	7/2/14	280	13			1		2.7	134.3 ↔ 134.3		Chulitna River	2.7 ↔ 2.7		59.7	0.0		8.2	0.0	1	17.7	4.8		0%
9233	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 134.3	9/25/13	4/30/14	217	1						134.3 ↔ 134.3														
9234	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 134.3	9/25/13	12/16/13	82	1						134.3 ↔ 134.3														
9235	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 142	9/25/13	4/23/15	575	3076	5	1	27	12.6	2.9	139.2 ↔ 142.1				20	49.5	1.4	7	7.2	3.3		36.5	0.0		100%
9178	Round Whitefish	Upper River	Watana Creek TRM 0.1	9/18/13	12/18/13	91	13			2	0.2	0.2	196.8 ↔ 196.9		Watana Creek	0 ↔ 0.1		62.3	0.0	2	9.7	10.7		31.7	0.0		100%
9180	Round Whitefish	Upper River	Watana Creek TRM 0.1	9/18/13	10/7/13	19	20			2	0.5		196.9 ↔ 196.9		Watana Creek	0 ↔ 0.1		62.3	0.0	2	9.7	10.7		31.7	0.0		100%
9183	Round Whitefish	Upper River	Watana Creek TRM 0.1	9/18/13	12/2/13	75	7			1	0.6	0.1	196.9 ↔ 196.9		Watana Creek	0 ↔ 0.1	1	62.3	1.7		9.8	0.0		31.0	0.0		100%
9193	Round Whitefish	Upper River	Susitna River PRM 206.7	9/19/13	9/24/14	370	151	1	1	24	47.3	99.7	107 ↔ 206.7				23	74.7	1.6	1	10.0	0.5		40.3	0.0		100%
9196	Round Whitefish	Upper River	Susitna River PRM 206.7	9/19/13	10/26/13	36	9460	2	1	2	2.9		206.7 ↔ 209.2		Kosina Creek	0 ↔ 0.1	1	62.3	0.8	1	9.7	5.3		31.7	0.0		100%
9198	Round Whitefish	Upper River	Susitna River PRM 206.7	9/19/13	6/4/15	623	7712	6	1	11	90.2	38.1	186.2 ↔ 209.3	2 ↑	Kosina Creek	0 ↔ 15	4	61.9	0.7	1	8.9	1.2	6	46.7	1.4		55%
9201	Round Whitefish	Upper River	Susitna River PRM 198.1	9/20/13	4/30/14	222	4			1	0	0	198.1 ↔ 198.1				1	62.3	1.7		9.8	0.0		31.0	0.0		100%
9202	Round Whitefish	Upper River	Susitna River PRM 198.1	9/20/13	11/13/13	54	15			2	1.4		196.7 ↔ 198.1					62.3	0.0	2	9.7	10.7		31.7	0.0		100%
9203	Round Whitefish	Upper River	Susitna River PRM 203.5	9/20/13	3/25/15	551	19353	4	1	17	13.5	17.3	187.2 ↔ 204		Deadman Creek	0 ↔ 0.5	11	52.2	1.2	4	8.6	2.6	2	35.3	0.3		94%
9204	Round Whitefish	Upper River	Susitna River PRM 203.5	9/20/13	12/18/13	89	1						203.5 ↔ 203.5														
9207	Round Whitefish	Upper River	Susitna River PRM 201.4	9/21/13	1/6/14	107	7			2	0.8	0.5	200.9 ↔ 201.4				2	62.3	1.7		9.7	0.0		31.7	0.0		100%
9208	Round Whitefish	Upper River	Susitna River PRM 201.4	9/21/13	8/30/14	343	2371	5	3	13	101.4	95.2	127.6 ↔ 209.2	1 ↓	Gilbert Creek, Kosina Creek	0 ↔ 7.4	6	46.7	0.9	4	7.7	3.8	3	39.8	0.5		77%
9213	Round Whitefish	Upper River	Goose Creek TRM 0.1	9/22/13	10/29/13	37	2384	2	1	2	3.9		232.8 ↔ 235.2		Goose Creek	0 ↔ 0.1	1	62.3	0.8	1	9.7	5.3		31.7	0.0		0%
9218	Round Whitefish	Upper River	Susitna River PRM 206.7	9/23/13	11/13/13	51	12			2	1		206.1 ↔ 206.9				1	62.3	0.8	1	9.7	5.3		31.7	0.0		100%
9219	Round Whitefish	Upper River	Susitna River PRM 206.7	9/23/13	1/28/14	127	4			1	9.5	9.5	197.2 ↔ 206.7				1	62.3	1.7		9.6	0.0		32.4	0.0		100%
9220	Round Whitefish	Upper River	Susitna River PRM 206.7	9/23/13	1/6/14	105	10			1	0.3	0.3	206.7 ↔ 207				1	62.3	1.7		9.8	0.0		31.0	0.0		100%
9221	Round Whitefish	Upper River	Susitna River PRM 206.7	9/23/13	2/17/14	147	12			2	0.7	0.4	206.6 ↔ 207				2	62.3	1.7		9.7	0.0		31.7	0.0		100%
9223	Round Whitefish	Upper River	Susitna River PRM 196.4	9/23/13	11/13/13	51	7			1	0.1		196.4 ↔ 196.5				1	62.3	1.7		9.8	0.0		31.0	0.0		100%
9344	Round Whitefish	Upper River	Watana Creek TRM 0.1	6/6/14	6/23/15	382	7111	11	2	16	43.3	12.4	196.9 ↔ 209.2		Watana Creek	0 ↔ 0.1	12	61.0	1.4	4	9.0	3.1		42.8	0.0		100%
9346	Round Whitefish	Upper River	Watana Creek TRM 0.1	6/6/14	7/25/14	49	7572	4	1	7	11.7		196.9 ↔ 200.3		Watana Creek	0 ↔ 0.1	6	56.6	1.6	1	8.7	1.7		39.5	0.0		100%
9369	Round Whitefish	Upper River	Susitna River PRM 206.7	6/7/14	9/17/14	102	8800	6	1	13	30.1	5.1	204.2 ↔ 209.2		Kosina Creek	0 ↔ 0.1	9	52.0	1.4	4	8.7	3.6		42.3	0.0		100%
9385	Round Whitefish	Upper River	Watana Creek TRM 0.1	6/8/14	6/23/15	380	29507	12	2	18	39.8	16.6	195.8 ↔ 209.2		Watana Creek	0 ↔ 3.2	9	59.5	0.9	5	8.9	3.4	4	39.5	0.6		100%
9387	Round Whitefish	Upper River	Susitna River PRM 198.9	6/8/14	9/5/14	89	34543	11	1	14	32.9	15.6	184.2 ↔ 198.9	1 ↓	Watana Creek	0 ↔ 0.9	9	50.3	1.2	4	8.3	3.3	1	35.7	0.2		100%

Table A-4. Tag summary for individual fish during the foraging season (Page 9 of 9).

							Foraging Season																				
Tag ID	Species	Tagging Segment	Release Location	Release Date	Last Live Date	Days Active	Total Detections	Fixed Station Events	# Fixed Stations Detected	# Aerial Surveys Detected	Distance Traveled (RM)	Linear Home Range (mi)	Mainstem Range (PRM)	Movments Past Dam Site	Tributaries & Lakes	Tributary Range (TRM)	Mainstem Aerial Detections	Ave Mainstem Survey Length (mi)	Mainstem Selection Ratio	Confluence Areal Detections	Ave Confluence Survey Length (mi)	Confluence Selection Ratio	Tributary Aerial Detections	Ave Tributary Survey Length (mi)	Tributary Selection Ratio	Lake Aerial Detections	% Aerial Detections in ZHI
9389	Round Whitefish	Upper River	Susitna River PRM 198.9	6/8/14	6/4/15	361	14131	3	1	13	17.8	9.5	196.9 ↔ 199.7		Watana Creek	0 ↔ 6.7	10	55.7	1.4	2	8.5	1.8	1	36.7	0.2		100%
9390	Round Whitefish	Upper River	Susitna River PRM 198.9	6/8/14	6/23/15	380	24967	11	2	15	76.9	28.1	181.1 ↔ 209.2	1 ↑			14	58.6	1.7	1	8.8	0.8		39.9	0.0		100%
9505	Round Whitefish	Upper River	Susitna River PRM 247.3	9/2/14	10/14/14	42	1						247.3 ↔ 247.3														
9506	Round Whitefish	Upper River	Susitna River PRM 247.3	9/2/14	10/14/14	42	3			1	0.3		247.3 ↔ 247.3		Tyone River	0 ↔ 0.3		74.0	0.0		10.7	0.0	1	75.0	2.1		0%
9524	Round Whitefish	Upper River	Susitna River PRM 213.6	9/4/14	1/6/15	124	6			1	0.2	0.2	213.6 ↔ 213.8				1	62.3	2.0		9.4	0.0		51.4	0.0		100%
9526	Round Whitefish	Upper River	Susitna River PRM 206.7	9/4/14	6/4/15	273	2372	2	1	3	6.1	20.3	206.7 ↔ 227				3	76.4	2.0		10.3	0.0		68.4	0.0		100%
9527	Round Whitefish	Upper River	Susitna River PRM 206.7	9/4/14	6/4/15	273	10085	1	1	3	2.5	3.9	206.7 ↔ 209.2		Kosina Creek	1.4 ↔ 1.4	2	76.4	1.4		10.3	0.0	1	68.4	0.8		100%
9528	Round Whitefish	Upper River	Susitna River PRM 206.7	9/4/14	6/23/15	292	86	1	1	3	9.4	7	204.5 ↔ 209.2		Kosina Creek	0 ↔ 2.3		88.3	0.0	1	9.7	5.0	2	46.0	2.1		100%
9529	Round Whitefish	Upper River	Susitna River PRM 206.7	9/4/14	2/19/15	168	10081	2	1	2	5.9	3.5	205.7 ↔ 209.2				2	68.2	2.1		10.1	0.0		63.2	0.0		100%
9543	Round Whitefish	Upper River	Susitna River PRM 206.7	9/6/14	10/14/14	38	1						206.7 ↔ 206.7														
9544	Round Whitefish	Upper River	Susitna River PRM 206.7	9/6/14	10/2/14	26	3			1	5.3		201.4 ↔ 206.7				1	74.0	2.2		10.7	0.0		75.0	0.0		100%
9545	Round Whitefish	Upper River	Susitna River PRM 198.9	9/6/14	6/23/15	290	1361	1	1	2	1.9	8	190.9 ↔ 198.9				2	92.8	1.9		10.8	0.0		69.1	0.0		100%
9551	Round Whitefish	Upper River	Susitna River PRM 198.9	9/7/14	1/6/15	121	832	1	1	1	3.2	3.2	195.7 ↔ 198.9				1	74.0	2.2		10.7	0.0		75.0	0.0		100%
9552	Round Whitefish	Upper River	Susitna River PRM 198.9	9/7/14	10/14/14	37	11			1	1.8		198.9 ↔ 200.7				1	74.0	2.2		10.7	0.0		75.0	0.0		100%
9553	Round Whitefish	Upper River	Susitna River PRM 198.9	9/7/14	10/16/14	39	231	1	1	1	1.9		197 ↔ 198.9				1	74.0	2.2		10.7	0.0		75.0	0.0		100%
9556	Round Whitefish	Upper River	Susitna River PRM 198.9	9/7/14	12/17/14	101	232	2	2	1	11.7	11.7	187.2 ↔ 198.9				1	74.0	2.2		10.7	0.0		75.0	0.0		100%
9557	Round Whitefish	Upper River	Susitna River PRM 198.9	9/7/14	9/22/14	15	812	4	3	1	36.7		167 ↔ 198.9	1 ↓	Unnamed 194.8	0 ↔ 0.2		74.0	0.0	1	10.7	14.9		75.0	0.0		100%
9560	Round Whitefish	Upper River	Susitna River PRM 198.9	9/7/14	10/9/14	32	1						198.9 ↔ 198.9														

Table A-5. Tag summary for individual fish during the overwintering season (Page 1 of 9).

				Overwintering Season																							
Tag ID	Species	Tagging Segment	Release Location	Release Date	Last Live Date	Days Active	Total Detections	Fixed Station Events	# Fixed Stations Detected	# Aerial Surveys Detected	Distance Traveled (RM)	Linear Home Range (mi)	Mainstem Range (PRM)	Movments Past Dam Site	Tributaries & Lakes	Tributary Range (TRM)	Mainstem Aerial Detections	Ave Mainstem Survey Length (mi)	Mainstem Selection Ratio	Confluence Aerial Detections	Ave Confluence Survey Length (mi)	Confluence Selection Ratio	Tributary Aerial Detections	Ave Tributary Survey Length (mi)	Tributary Selection Ratio	Lake Aerial Detections	% Aerial Detections in ZHI
9001	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 124.2	6/13/13	7/28/13	45																					
9002	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 124.2	6/13/13	7/25/14	407	42			6	37.1	35.4	103.6 ↔ 139				5	65.6	1.1	1	8.5	1.7		12.9	0.0		100%
9003	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 124.2	6/13/13	8/27/13	75																					
9004	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 124.2	6/13/13	10/28/14	502	2671	3	1	9	47.4	57.7	84.5 ↔ 142.2				4	52.0	0.7	5	7.2	6.7		27.7	0.0		100%
9007	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 124.2	6/14/13	7/9/13	25																					
9010	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 124.2	6/14/13	7/13/13	28																					
9014	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 124.2	6/15/13	3/25/15	648	414	1	1	10	68.4	68.4	83.9 ↔ 152.3				8	53.1	1.4	2	7.6	2.4		29.7	0.0		100%
9015	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 124.2	6/16/13	8/10/13	55																					
9016	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 124.2	6/16/13	12/17/14	549	50	1	1	5	10.2	10	134.1 ↔ 144.1				2	51.5	0.8	3	7.2	8.8		47.3	0.0		100%
9020	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 124.2	6/16/13	8/12/13	57																					
9029	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 124.2	6/17/13	8/10/13	54																					
9115	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 152.3	7/23/13	8/27/13	35																					
9170	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 134.3	9/19/13	10/13/13	23																					
9227	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 134.3	9/25/13	10/22/13	27																					
9236	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 142	9/25/13	5/29/14	246	50			7	10.5	7.6	120.4 ↔ 128				7	61.2	1.3		8.0	0.0		13.2	0.0		100%
9091	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	7/18/13	7/23/13	5																					
9092	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	7/18/13	8/13/13	26																					
9093	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	7/18/13	9/23/13	67																					
9094	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	7/18/13	9/30/13	74																					
9095	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	7/18/13	10/15/13	89																					
9096	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	7/18/13	10/2/13	76																					
9097	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	7/18/13	8/20/13	33																					
9098	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	7/18/13	9/16/13	60																					
9124	Arctic Grayling	Middle/Lower US of DC	Susitna River PRM 179.4	7/24/13	6/28/14	339	66			7	1.4	0.7	180.2 ↔ 180.9				7	52.5	1.5		7.6	0.0		19.0	0.0		100%
9125	Arctic Grayling	Middle/Lower US of DC	Susitna River PRM 179.4	7/24/13	12/18/13	147	17			3	0.3	0.2	180.7 ↔ 180.9				3	32.7	1.5		6.0	0.0		11.6	0.0		100%
9126	Arctic Grayling	Middle/Lower US of DC	Susitna River PRM 179.4	7/24/13	5/12/14	292	37			6	4.7	4.6	169 ↔ 173.6				3	57.9	0.8	3	8.4	5.2		21.5	0.0		100%
9127	Arctic Grayling	Middle/Lower US of DC	Susitna River PRM 179.4	7/24/13	9/7/13	45																					
9128	Arctic Grayling	Middle/Lower US of DC	Susitna River PRM 179.4	7/24/13	12/18/13	147	21			3	2	1.7	172.9 ↔ 174.6				3	32.7	1.5		6.0	0.0		11.6	0.0		100%
9129	Arctic Grayling	Middle/Lower US of DC	Susitna River PRM 179.4	7/24/13	10/21/13	89																					
9130	Arctic Grayling	Middle/Lower US of DC	Susitna River PRM 179.4	7/24/13	12/18/13	147	25			3	2.3	2	178.6 ↔ 180.6				3	32.7	1.5		6.0	0.0		11.6	0.0		100%
9131	Arctic Grayling	Middle/Lower US of DC	Susitna River PRM 179.4	7/24/13	11/13/13	112	29	1	1	1	0.2	0.2	166.8 ↔ 167				1	19.8	1.3		2.9	0.0		3.9	0.0		100%
9164	Arctic Grayling	Middle/Lower US of DC	Susitna River PRM 175	8/21/13	8/21/13	0																					
9240	Arctic Grayling	Middle/Lower US of DC	Susitna River PRM 179.4	9/26/13	9/5/14	344	45			7	2.9	1.8	172.7 ↔ 174.5				2	52.5	0.4	5	7.6	7.4		19.0	0.0		100%
9241	Arctic Grayling	Middle/Lower US of DC	Susitna River PRM 179.4	9/26/13	12/2/13	67	4			1			183.3 ↔ 183.3				1	39.2	2.0		8.2	0.0		31.0	0.0		100%
9381	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	6/8/14	6/23/15	380	1272	2	2	7	64.5	32.8	184.6 ↔ 217.3	1 ↑	Jay Creek	0 ↔ 0.1	5	80.5	1.2	2	9.4	4.2		47.9	0.0		100%
9382	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	6/8/14	7/14/14	36																					
9406	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	6/9/14	7/10/14	31																					
9407	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	6/9/14	6/23/15	379	74			9	11.4	7.3	173.5 ↔ 180.8				8	59.4	1.4	1	7.3	1.4		25.3	0.0		100%
9408	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	6/9/14	6/23/15	379	93	1	1	9	17.3	15.1	235.2 ↔ 247.3		Tyone River	0 ↔ 3	3	81.0	0.6		9.3	0.0	6	45.3	2.0		0%
9409	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	6/9/14	9/17/14	100																					
9410	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	6/9/14	7/10/14	31																					
9411	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	6/9/14	6/23/15	379	314	1	1	7	40.5	19.7	189.5 ↔ 209.2				5	83.3	1.2	2	9.9	4.1		47.8	0.0		100%
9081	Arctic Grayling	Upper River	Oshetna River TRM 18.3	7/17/13	2/17/14	215	20			3	0.4	0.4			Tyone River	1.4 ↔ 1.8		47.9	0.0		4.1	0.0	3	5.7	10.1		0%
9082	Arctic Grayling	Upper River	Oshetna River TRM 18.3	7/17/13	9/2/13	47																					
9083	Arctic Grayling	Upper River	Oshetna River TRM 21.7	7/17/13	10/18/13	93																					
9084	Arctic Grayling	Upper River	Oshetna River TRM 21.7	7/17/13	10/7/13	82																					
9085	Arctic Grayling	Upper River	Oshetna River TRM 21.7	7/17/13	6/29/14	347	22			4	2.4	2.2	244.1 ↔ 246.3				4	54.4	1.4		5.7	0.0		18.0	0.0		0%
9086	Arctic Grayling	Upper River	Oshetna River TRM 21.7	7/17/13	6/23/15	706	176			13	2.4	2.8			Tyone River	2.5 ↔ 5.3		75.7	0.0		8.8	0.0	13	39.0	3.2		0%
9087	Arctic Grayling	Upper River	Oshetna River TRM 21.7	7/17/13	7/17/13	0																					
9088	Arctic Grayling	Upper River	Oshetna River TRM 21.7	7/17/13	7/17/13	0																					

Table A-5. Tag summary for individual fish during the overwintering season (Page 2 of 9).

				Overwintering Season																							
Tag ID	Species	Tagging Segment	Release Location	Release Date	Last Live Date	Days Active	Total Detections	Fixed Station Events	# Fixed Stations Detected	# Aerial Surveys Detected	Distance Traveled (RM)	Linear Home Range (mi)	Mainstem Range (PRM)	Movments Past Dam Site	Tributaries & Lakes	Tributary Range (TRM)	Mainstem Aerial Detections	Ave Mainstem Survey Length (mi)	Mainstem Selection Ratio	Confluence Aerial Detections	Ave Confluence Survey Length (mi)	Confluence Selection Ratio	Tributary Aerial Detections	Ave Tributary Survey Length (mi)	Tributary Selection Ratio	Lake Aerial Detections	% Aerial Detections in ZHI
9089	Arctic Grayling	Upper River	Susitna River PRM 189.5	7/18/13	9/2/13	46																					
9090	Arctic Grayling	Upper River	Susitna River PRM 189.5	7/18/13	7/26/13	8																					
9099	Arctic Grayling	Upper River	Watana Creek TRM 0.1	7/18/13	5/20/14	306	49			7	4.6	3.9	194.2 ↔ 198.1				3	52.0	0.7	4	7.8	5.8		19.6	0.0		100%
9100	Arctic Grayling	Upper River	Watana Creek TRM 0.1	7/18/13	12/2/13	137	25			2	8.6	8.6	184.8 ↔ 193.4	1 ↓			1	29.5	0.9	1	5.6	4.7		17.5	0.0		100%
9101	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	7/19/13	10/9/13	82																					
9102	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	7/19/13	9/30/13	73																					
9103	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	7/19/13	7/31/13	12																					
9104	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	7/19/13	9/9/13	52																					
9105	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	7/19/13	8/20/13	32																					
9106	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	7/19/13	8/26/13	38																					
9107	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	7/19/13	6/29/14	345	56			7	15.2	15.2	184.9 ↔ 200.1	1 ↓			7	52.0	1.5		7.8	0.0		19.6	0.0		100%
9108	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	7/19/13	9/24/13	67																					
9109	Arctic Grayling	Upper River	Goose Creek TRM 0.3	7/22/13	7/31/13	9																					
9110	Arctic Grayling	Upper River	Goose Creek TRM 0.3	7/22/13	8/6/13	15																					
9111	Arctic Grayling	Upper River	Goose Creek TRM 0.1	7/22/13	8/13/13	22																					
9113	Arctic Grayling	Upper River	Clearwater Creek TRM 0.9	7/22/13	7/22/13	0																					
9114	Arctic Grayling	Upper River	Clearwater Creek TRM 0.9	7/22/13	11/11/13	112	1			1					Tyone River	0.2 ↔ 0.2		34.8	0.0	1	2.1	24.4		14.3	0.0		0%
9132	Arctic Grayling	Upper River	Watana Creek TRM 0.1	7/25/13	8/6/13	12																					
9139	Arctic Grayling	Upper River	Susitna River PRM 189.5	7/27/13	8/26/13	30																					
9140	Arctic Grayling	Upper River	Susitna River PRM 189.5	7/27/13	9/16/13	51																					
9141	Arctic Grayling	Upper River	Susitna River PRM 189.5	7/27/13	1/28/14	185	37			4	1.4	0.6	184.9 ↔ 185.5	1 ↓			4	49.9	1.5		7.9	0.0		18.6	0.0		100%
9142	Arctic Grayling	Upper River	Susitna River PRM 189.5	7/27/13	4/30/14	277	69			7	4.1	3.8	172.1 ↔ 175.9				7	52.5	1.5		7.6	0.0		19.0	0.0		100%
9143	Arctic Grayling	Upper River	Susitna River PRM 189.5	7/27/13	5/20/14	297	39			5	1.2	0.8	185.7 ↔ 186.5	1 ↓			5	61.7	1.5		8.5	0.0		19.6	0.0		100%
9163	Arctic Grayling	Upper River	Susitna River PRM 203.5	8/20/13	5/20/14	273	54			7	23.5	23.1	174.6 ↔ 197.7	1 ↓			6	52.0	1.3	1	7.8	1.5		19.6	0.0		100%
9171	Arctic Grayling	Upper River	Watana Creek TRM 0.1	9/18/13	5/20/14	244	74			7	10	9.7	185 ↔ 194.7	1 ↓			6	52.0	1.3	1	7.8	1.5		19.6	0.0		100%
9172	Arctic Grayling	Upper River	Watana Creek TRM 0.1	9/18/13	4/30/14	224	107			7	7.5	4.2	195.3 ↔ 199.5				6	52.0	1.3	1	7.8	1.5		19.6	0.0		100%
9173	Arctic Grayling	Upper River	Watana Creek TRM 0.1	9/18/13	1/6/15	475	120	1	1	10	7.8	2.6	194.4 ↔ 197				5	64.6	0.8	5	8.6	6.2		33.8	0.0		100%
9174	Arctic Grayling	Upper River	Watana Creek TRM 0.1	9/18/13	4/30/14	224	91			7	4.8	3.3	197.7 ↔ 201				5	52.0	1.1	2	7.8	2.9		19.6	0.0		100%
9175	Arctic Grayling	Upper River	Watana Creek TRM 0.1	9/18/13	6/2/14	257	105			7	2	1.7	200.1 ↔ 201.8				7	52.0	1.5		7.8	0.0		19.6	0.0		100%
9176	Arctic Grayling	Upper River	Watana Creek TRM 0.1	9/18/13	10/22/13	34																					
9177	Arctic Grayling	Upper River	Watana Creek TRM 0.1	9/18/13	11/12/13	55	5			1			197.9 ↔ 197.9					16.2	0.0	1	3.7	7.6		8.2	0.0		100%
9179	Arctic Grayling	Upper River	Watana Creek TRM 0.1	9/18/13	12/18/13	91	14			2	1.1	1.1	195.1 ↔ 196.2				2	39.2	1.6		7.6	0.0		15.5	0.0		100%
9181	Arctic Grayling	Upper River	Watana Creek TRM 0.1	9/18/13	10/7/13	19																					
9182	Arctic Grayling	Upper River	Watana Creek TRM 0.1	9/18/13	1/6/14	110	39			4	4.2	4	194 ↔ 198				4	38.8	1.5		6.8	0.0		14.3	0.0		100%
9184	Arctic Grayling	Upper River	Watana Creek TRM 0.1	9/18/13	6/16/14	271	108			7	3.2	3.1	196.2 ↔ 199.3				6	52.0	1.3	1	7.8	1.5		19.6	0.0		100%
9185	Arctic Grayling	Upper River	Susitna River PRM 187.7	9/19/13	11/13/13	55	3			1			181.6 ↔ 181.6				1	19.8	1.3		2.9	0.0		3.9	0.0		100%
9186	Arctic Grayling	Upper River	Susitna River PRM 208.3	9/19/13	11/11/13	53	2			1					Tyone River	1.1 ↔ 1.1		34.8	0.0		2.1	0.0	1	14.3	3.6		0%
9187	Arctic Grayling	Upper River	Susitna River PRM 208.3	9/19/13	6/4/15	623	7105	1	1	15	16.7	6.7	202.5 ↔ 209.2				12	69.1	1.2	3	8.7	2.5		30.1	0.0		100%
9188	Arctic Grayling	Upper River	Susitna River PRM 208.3	9/19/13	3/18/14	180	105			7	5.4	5.4	200.1 ↔ 205.5				6	52.0	1.3	1	7.8	1.5		19.6	0.0		100%
9189	Arctic Grayling	Upper River	Susitna River PRM 206.7	9/19/13	6/11/14	265	10			1					Tyone River	0.3 ↔ 0.3		74.0	0.0		8.5	0.0	1	0.0			0%
9194	Arctic Grayling	Upper River	Susitna River PRM 206.7	9/19/13	12/3/13	75	17			2	0	0	131.8 ↔ 131.8				2	47.3	1.4		6.9	0.0		14.4	0.0		100%
9210	Arctic Grayling	Upper River	Susitna River PRM 211	9/22/13	7/10/14	291	61			7	22	20.8	190.2 ↔ 211				4	52.0	0.9	3	7.8	4.4		19.6	0.0		100%
9211	Arctic Grayling	Upper River	Susitna River PRM 211	9/22/13	10/21/13	29																					
9212	Arctic Grayling	Upper River	Goose Creek TRM 0.1	9/22/13	9/23/14	366	103			6	31	31	203.8 ↔ 234.8				6	57.2	1.5		7.4	0.0		18.8	0.0		83%
9214	Arctic Grayling	Upper River	Goose Creek TRM 0.1	9/22/13	7/5/14	286																					
9215	Arctic Grayling	Upper River	Goose Creek TRM 0.1	9/22/13	11/11/13	50	2			1			243.1 ↔ 243.1				1	34.8	1.5		2.1	0.0		14.3	0.0		0%
9216	Arctic Grayling	Upper River	Goose Creek TRM 0.1	9/22/13	11/11/13	50	2			1			237.7 ↔ 237.7				1	34.8	1.5		2.1	0.0		14.3	0.0		0%
9217	Arctic Grayling	Upper River	Goose Creek TRM 0.1	9/22/13	6/23/15	639	152			17	42.7	21.4	192 ↔ 213.4				13	68.5	1.2	4	8.7	3.0		34.5	0.0		100%
9225	Arctic Grayling	Upper River	Susitna River PRM 196.4	9/23/13	8/3/14	313	71			7	6.8	6.3	194.4 ↔ 200.7				4	52.0	0.9	3	7.8	4.4		19.6	0.0		100%
9226	Arctic Grayling	Upper River	Susitna River PRM 196.4	9/23/13	9/23/13	0																					

Table A-5. Tag summary for individual fish during the overwintering season (Page 3 of 9).

				Overwintering Season																							
Tag ID	Species	Tagging Segment	Release Location	Release Date	Last Live Date	Days Active	Total Detections	Fixed Station Events	# Fixed Stations Detected	# Aerial Surveys Detected	Distance Traveled (RM)	Linear Home Range (mi)	Mainstem Range (PRM)	Movments Past Dam Site	Tributaries & Lakes	Tributary Range (TRM)	Mainstem Aerial Detections	Ave Mainstem Survey Length (mi)	Mainstem Selection Ratio	Confluence Aerial Detections	Ave Confluence Survey Length (mi)	Confluence Selection Ratio	Tributary Aerial Detections	Ave Tributary Survey Length (mi)	Tributary Selection Ratio	Lake Aerial Detections	% Aerial Detections in ZHI
9300	Arctic Grayling	Upper River	Susitna River PRM 203.5	6/2/14	7/10/14	38																					
9301	Arctic Grayling	Upper River	Susitna River PRM 203.5	6/2/14	6/23/15	386	93			10	35.5	24.6	190.6 ↔ 215.2				9	80.2	1.5	1	9.4	1.4		45.0	0.0		100%
9303	Arctic Grayling	Upper River	Susitna River PRM 203.5	6/2/14	6/23/15	386	420	1	1	11	15.5	14.3	184.8 ↔ 199.1	1 ↑			10	75.4	1.5	1	8.9	1.3		42.1	0.0		100%
9305	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/2/14	6/23/15	386	285	1	1	9	15.4	15	181.6 ↔ 196.6	1 ↑			7	81.1	1.3	2	9.7	3.2		47.0	0.0		100%
9306	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/2/14	2/3/15	246	61			7	9.9	9.7	189.2 ↔ 198.9				6	71.0	1.5	1	8.4	2.1		43.3	0.0		100%
9311	Arctic Grayling	Upper River	Susitna River PRM 194.8	6/3/14	6/23/15	385	69			10	4.6	3.9	177 ↔ 180.9				10	60.6	1.6		7.6	0.0		27.0	0.0		100%
9312	Arctic Grayling	Upper River	Susitna River PRM 194.8	6/3/14	11/24/14	174	1595	1	1	3	9.5	8.3	167 ↔ 175.3				3	58.1	1.9		8.3	0.0		41.1	0.0		100%
9313	Arctic Grayling	Upper River	Susitna River PRM 227.1	6/4/14	9/17/14	105																					
9314	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/4/14	10/2/14	120	6			1			208.4 ↔ 208.4				1	72.1	1.7		9.6	0.0		41.9	0.0		100%
9315	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/4/14	6/28/14	24																					
9317	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/4/14	12/4/14	183	8136	2	1	3	4.7	3.8	184.3 ↔ 188.1	2 ↕			3	42.8	1.6		6.2	0.0		19.5	0.0		100%
9318	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/4/14	10/2/14	120																					
9319	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/4/14	8/21/14	78																					
9320	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/4/14	6/23/15	384	30782	2	1	10	19.1	9.1	201.3 ↔ 210.3		Kosina Creek	0 ↔ 0.1	8	80.2	1.3	2	9.4	2.9		45.0	0.0		100%
9322	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/4/14	10/14/14	132	15			2	0.5	0.5	188.9 ↔ 189.4				1	73.1	0.9	1	10.1	6.9		54.8	0.0		100%
9323	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/4/14	4/23/15	323	13383	3	3	9	37.9	37.5	171.7 ↔ 209.2	1 ↓			8	59.2	1.3	1	7.2	1.4		22.4	0.0		100%
9324	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/4/14	12/16/14	195	13			4	8.8	8.8	198.3 ↔ 207.1				3	69.9	1.4	1	9.0	3.8		55.6	0.0		100%
9325	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/4/14	6/23/15	384	5376	1	1	10	33.7	14.2	202.4 ↔ 216.6				8	80.2	1.3	2	9.4	2.9		45.0	0.0		100%
9326	Arctic Grayling	Upper River	Susitna River PRM 203.5	6/4/14	2/3/15	244	17			5	1.9	1.8	196.6 ↔ 198.4				1	75.4	0.4	4	8.4	13.0		51.8	0.0		100%
9327	Arctic Grayling	Upper River	Susitna River PRM 203.5	6/4/14	6/29/14	25																					
9333	Arctic Grayling	Upper River	Susitna River PRM 206.7	6/5/14	6/4/15	364	10573	1	1	9	17.2	11.6	202.2 ↔ 211		Kosina Creek	0 ↔ 2.8	6	83.0	1.1	2	9.6	3.1	1	42.4	0.4		100%
9334	Arctic Grayling	Upper River	Susitna River PRM 206.7	6/5/14	2/3/15	243	354	1	1	5	3.5	3.5	193.5 ↔ 197				5	75.4	1.8		8.4	0.0		51.8	0.0		100%
9335	Arctic Grayling	Upper River	Susitna River PRM 206.7	6/5/14	6/4/15	364	1508	1	1	9	10	6.5	192.1 ↔ 198.6				8	80.8	1.5	1	9.2	1.6		42.4	0.0		100%
9337	Arctic Grayling	Upper River	Susitna River PRM 227.1	6/5/14	1/6/15	215	27			5	5.7	5.7	188.1 ↔ 193.8				5	69.3	1.7		8.6	0.0		42.2	0.0		100%
9349	Arctic Grayling	Upper River	Susitna River PRM 203.5	6/6/14	4/14/15	312	4637	1	1	9	25.2	12.2	197 ↔ 209.2				7	80.8	1.3	2	9.2	3.2		42.4	0.0		100%
9355	Arctic Grayling	Upper River	Watana Creek TRM 0.1	6/7/14	7/10/14	33																					
9357	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/7/14	6/4/15	362	27926	2	1	10	17.4	14	195.2 ↔ 209.2				9	80.2	1.5	1	9.4	1.4		45.0	0.0		100%
9358	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/7/14	9/30/14	115																					
9359	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/7/14	6/28/14	21																					
9360	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/7/14	7/17/14	40																					
9361	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/7/14	9/17/14	102																					
9362	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/7/14	6/23/15	381	3330	2	1	10	27.8	12.6	199.2 ↔ 211.8				8	80.2	1.3	2	9.4	2.9		45.0	0.0		100%
9363	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/7/14	5/20/15	347	55			10	16.5	14.2	190.5 ↔ 204.7				7	80.2	1.2	3	9.4	4.3		45.0	0.0		100%
9364	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/7/14	8/11/14	65																					
9365	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/7/14	7/14/14	37																					
9366	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/7/14	7/25/14	48																					
9367	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/7/14	6/23/15	381	7884	1	1	9	41.3	29.4	198.6 ↔ 228				9	80.8	1.6		9.2	0.0		42.4	0.0		100%
9374	Arctic Grayling	Upper River	Susitna River PRM 196.4	6/7/14	8/3/14	57																					
9383	Arctic Grayling	Upper River	Watana Creek TRM 0.1	6/8/14	6/17/14	9																					
9386	Arctic Grayling	Upper River	Susitna River PRM 198.9	6/8/14	10/14/14	128	5			1			195.3 ↔ 195.3				1	74.0	2.1		10.5	0.0		67.6	0.0		100%
9391	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	7/4/14	25																					
9392	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	8/13/14	65																					
9393	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	6/28/14	19																					
9394	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	6/28/14	19																					
9395	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	10/20/14	132	281	1	1	1	2	2	187.2 ↔ 189.2					72.1	0.0	1	9.6	12.9		41.9	0.0		100%
9396	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	7/15/14	36																					
9397	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	8/22/14	74																					
9399	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	7/22/14	43																					
9400	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	10/2/14	115	3			1			174.6 ↔ 174.6				1	72.1	1.7		9.6	0.0		41.9	0.0		100%
9401	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	8/21/14	73																					

Table A-5. Tag summary for individual fish during the overwintering season (Page 4 of 9).

				Overwintering Season																							
Tag ID	Species	Tagging Segment	Release Location	Release Date	Last Live Date	Days Active	Total Detections	Fixed Station Events	# Fixed Stations Detected	# Aerial Surveys Detected	Distance Traveled (RM)	Linear Home Range (mi)	Mainstem Range (PRM)	Movments Past Dam Site	Tributaries & Lakes	Tributary Range (TRM)	Mainstem Aerial Detections	Ave Mainstem Survey Length (mi)	Mainstem Selection Ratio	Confluence Aerial Detections	Ave Confluence Survey Length (mi)	Confluence Selection Ratio	Tributary Aerial Detections	Ave Tributary Survey Length (mi)	Tributary Selection Ratio	Lake Aerial Detections	% Aerial Detections in ZHI
9402	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	7/17/14	38																					
9403	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	6/4/15	360	74			10	5.3	2.2	182.5 ↔ 184.7				6	67.3	1.0	4	8.3	5.2		33.3	0.0		100%
9404	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	8/6/14	58																					
9047	Burbot	Middle/Lower DS of DC	Susitna River PRM 107	6/21/13	10/24/13	125																					
9050	Burbot	Middle/Lower DS of DC	Susitna River PRM 107	6/21/13	3/19/14	271	42			5	13.3	13.3	102.2 ↔ 115.5				3	70.6	0.8	2	8.5	4.2		9.9	0.0		100%
9144	Burbot	Middle/Lower DS of DC	Susitna River PRM 124.2	8/8/13	8/12/13	4																					
9147	Burbot	Middle/Lower DS of DC	Susitna River PRM 33.9	8/16/13	9/13/13	28																					
9148	Burbot	Middle/Lower DS of DC	Susitna River PRM 33.9	8/16/13	9/20/13	35																					
9149	Burbot	Middle/Lower DS of DC	Susitna River PRM 33.8	8/16/13	8/30/13	14																					
9150	Burbot	Middle/Lower DS of DC	Fish Creek (Krotb) TRM 1.9	8/16/13	9/20/13	35																					
9245	Burbot	Middle/Lower DS of DC	Susitna River PRM 80.9	9/28/13	12/17/14	445	100			9	27	12.2	80.4 ↔ 92.6				7	82.0	1.2	2	9.9	2.9		37.9	0.0		56%
9246	Burbot	Middle/Lower DS of DC	Susitna River PRM 80.9	9/28/13	10/24/13	26																					
9561	Burbot	Middle/Lower US of DC	Susitna River PRM 186.8	9/8/14	12/16/14	99	29			3	0.6	0.6	186.1 ↔ 186.7	1 ↓			3	45.2	1.6		5.8	0.0		20.4	0.0		100%
9562	Burbot	Middle/Lower US of DC	Susitna River PRM 186.8	9/8/14	10/29/14	51																					
9563	Burbot	Middle/Lower US of DC	Susitna River PRM 183.8	9/8/14	6/23/15	288	86			9	11	11	174.1 ↔ 185.1				9	68.0	1.7		8.3	0.0		36.4	0.0		100%
9564	Burbot	Middle/Lower US of DC	Susitna River PRM 185.2	9/9/14	6/23/15	287	92			10	10.4	10.4	174.9 ↔ 185.3				10	68.4	1.7		8.4	0.0		37.0	0.0		100%
9565	Burbot	Middle/Lower US of DC	Susitna River PRM 186.8	9/9/14	4/23/15	226	1375	2	1	9	4.7	1.7	185.5 ↔ 187.2	5 ↕			9	79.5	1.7		9.4	0.0		43.8	0.0		100%
9191	Burbot	Upper River	Susitna River PRM 206.7	9/19/13	9/23/13	4																					
9192	Burbot	Upper River	Susitna River PRM 206.7	9/19/13	4/9/14	202	40			5	1.8	1.6	206.2 ↔ 207.8				3	45.8	0.9	2	7.4	3.7		15.0	0.0		100%
9205	Burbot	Upper River	Watana Creek TRM 0.1	9/20/13	12/18/13	89	39			3	3.2	3.2	194.2 ↔ 197.4				2	32.7	1.0	1	6.0	2.8		11.6	0.0		100%
9206	Burbot	Upper River	Watana Creek TRM 0.1	9/21/13	6/24/14	276	174			5	2.8	1.5	195.4 ↔ 196.9				4	64.4	1.2	1	9.1	2.1		21.9	0.0		100%
9209	Burbot	Upper River	Susitna River PRM 215.2	9/21/13	5/20/14	241	59			6	4.7	4.7	212.3 ↔ 217				6	56.3	1.5		8.2	0.0		19.6	0.0		100%
9222	Burbot	Upper River	Watana Creek TRM 0.1	9/23/13	6/23/15	638	124			14	22.2	22.2	197 ↔ 219.2				6	75.8	0.7	8	9.2	7.6		37.8	0.0		100%
9224	Burbot	Upper River	Susitna River PRM 196.4	9/23/13	4/23/15	577	153			16	6.6	2.5	193.4 ↔ 195.9				13	69.9	1.3	3	8.9	2.4		37.1	0.0		100%
9304	Burbot	Upper River	Susitna River PRM 203.5	6/2/14	7/10/14	38																					
9309	Burbot	Upper River	Watana Creek TRM 0.1	6/3/14	5/20/15	351	88			10	5.9	5.9	192.5 ↔ 198.4				7	81.3	1.2	3	9.4	4.4		48.7	0.0		100%
9310	Burbot	Upper River	Watana Creek TRM 0.1	6/3/14	6/28/14	25																					
9329	Burbot	Upper River	Watana Creek TRM 0.1	6/5/14	9/5/14	92																					
9330	Burbot	Upper River	Watana Creek TRM 0.1	6/5/14	11/5/14	153	20			4	2.8	2.6	189.6 ↔ 192.2				3	57.1	1.5	1	8.0	3.5		47.9	0.0		100%
9331	Burbot	Upper River	Susitna River PRM 203.5	6/5/14	9/5/14	92																					
9332	Burbot	Upper River	Susitna River PRM 203.5	6/5/14	10/14/14	131	8			2	0.1	0.1	193.9 ↔ 194				2	73.1	1.9		10.1	0.0		54.8	0.0		100%
9336	Burbot	Upper River	Susitna River PRM 206.7	6/5/14	10/2/14	119	3			1			207.3 ↔ 207.3				1	72.1	1.7		9.6	0.0		41.9	0.0		100%
9343	Burbot	Upper River	Watana Creek TRM 0.1	6/6/14	6/23/15	382	133			10	3.4	2.3	198.2 ↔ 200.5				10	81.3	1.7		9.4	0.0		48.7	0.0		100%
9351	Burbot	Upper River	Susitna River PRM 203.5	6/6/14	4/14/15	312	83			7	2.3	2.3	203.3 ↔ 205.6				3	82.0	0.7	4	9.1	8.5		43.4	0.0		100%
9352	Burbot	Upper River	Susitna River PRM 203.5	6/6/14	6/23/15	382	86			9	6.3	3.1	202 ↔ 205.1				3	82.3	0.6	6	9.4	10.0		49.4	0.0		100%
9373	Burbot	Upper River	Susitna River PRM 196.4	6/7/14	6/23/15	381	88			9	6.5	6.5	195.1 ↔ 201.6				9	82.3	1.7		9.4	0.0		49.4	0.0		100%
9378	Burbot	Upper River	Susitna River PRM 211	6/8/14	2/19/15	256	49			6	6.1	5.2	205.9 ↔ 211.1				1	74.0	0.3	5	8.8	12.7		50.6	0.0		100%
9379	Burbot	Upper River	Susitna River PRM 211	6/8/14	8/30/14	84																					
9511	Burbot	Upper River	Susitna River PRM 247.3	9/3/14	11/4/14	62	13			2	1.2	0.2	247.3 ↔ 247.3		Tyone River	0 ↔ 0.2	1	63.2	1.0	1	8.4	7.5		55.1	0.0		0%
9512	Burbot	Upper River	Susitna River PRM 247.3	9/3/14	6/23/15	293	146			10	6.2	1.6	247.1 ↔ 248.6		Tyone River	0 ↔ 0.1	4	81.3	0.7	6	9.4	8.9		48.7	0.0		0%
9514	Burbot	Upper River	Susitna River PRM 247.3	9/3/14	6/23/15	293	71			9	2.4	2.2	244.4 ↔ 246.6				9	82.1	1.7		9.3	0.0		46.6	0.0		0%
9515	Burbot	Upper River	Susitna River PRM 247.3	9/3/14	9/17/14	14																					
9516	Burbot	Upper River	Susitna River PRM 247.3	9/3/14	9/3/14	0																					
9517	Burbot	Upper River	Susitna River PRM 232.4	9/3/14	6/23/15	293	15572	1	1	10	7.4	7.4	229.7 ↔ 237.1				9	81.3	1.5	1	9.4	1.5		48.7	0.0		40%
9518	Burbot	Upper River	Susitna River PRM 232.4	9/3/14	3/25/15	203	39			8	18.8	18.8	230.8 ↔ 249.6				8	78.7	1.7		9.2	0.0		43.2	0.0		75%
9519	Burbot	Upper River	Susitna River PRM 211.1	9/4/14	6/23/15	292	135			10	7.3	7.3	210 ↔ 217.3				7	81.3	1.2	3	9.4	4.4		48.7	0.0		100%
9520	Burbot	Upper River	Susitna River PRM 210.3	9/4/14	6/23/15	292	50085	2	1	10	10.2	9.6	199.8 ↔ 209.4				9	81.3	1.5	1	9.4	1.5		48.7	0.0		100%
9521	Burbot	Upper River	Susitna River PRM 210.3	9/4/14	10/2/14	28	5			1			211.1 ↔ 211.1					72.1	0.0	1	9.6	12.9		41.9	0.0		100%
9522	Burbot	Upper River	Susitna River PRM 210.3	9/4/14	11/4/14	61	52384	2	1	3	1.2	0.8	208.6 ↔ 209.2		Kosina Creek	0 ↔ 0.2	1	66.8	0.7	2	9.1	9.9		59.2	0.0		100%
9523	Burbot	Upper River	Susitna River PRM 210.3	9/4/14	4/23/15	231	94	1	1	8	2	1.4	209.2 ↔ 210.6				7	85.6	1.4	1	9.6	1.8		43.9	0.0		100%

Table A-5. Tag summary for individual fish during the overwintering season (Page 5 of 9).

				Overwintering Season																							
Tag ID	Species	Tagging Segment	Release Location	Release Date	Last Live Date	Days Active	Total Detections	Fixed Station Events	# Fixed Stations Detected	# Aerial Surveys Detected	Distance Traveled (RM)	Linear Home Range (mi)	Mainstem Range (PRM)	Movments Past Dam Site	Tributaries & Lakes	Tributary Range (TRM)	Mainstem Aerial Detections	Ave Mainstem Survey Length (mi)	Mainstem Selection Ratio	Confluence Aerial Detections	Ave Confluence Survey Length (mi)	Confluence Selection Ratio	Tributary Aerial Detections	Ave Tributary Survey Length (mi)	Tributary Selection Ratio	Lake Aerial Detections	% Aerial Detections in ZHI
9539	Burbot	Upper River	Watana Creek TRM 0.1	9/6/14	6/23/15	290	15893	1	1	10	2.8	1.1	196 ↔ 197		Watana Creek	0 ↔ 0.1	1	81.3	0.2	9	9.4	13.3		48.7	0.0		100%
9541	Burbot	Upper River	Susitna River PRM 192.7	9/6/14	6/23/15	290	51			10	3.6	2.3	190.2 ↔ 192.5				10	77.0	1.7		9.2	0.0		46.3	0.0		100%
9546	Burbot	Upper River	Susitna River PRM 192.7	9/7/14	6/23/15	289	68			9	4.6	2.7	190.3 ↔ 193				9	72.4	1.7		8.5	0.0		40.8	0.0		100%
9547	Burbot	Upper River	Susitna River PRM 194.3	9/7/14	9/27/14	20																					
9548	Burbot	Upper River	Watana Creek TRM 0.1	9/7/14	5/20/15	255	39			7	0.9	0.9	195.2 ↔ 196.1				7	87.7	1.6		10.0	0.0		46.3	0.0		100%
9549	Burbot	Upper River	Watana Creek TRM 0.1	9/7/14	10/2/14	25	3			1			195.6 ↔ 195.6				1	72.1	1.7		9.6	0.0		41.9	0.0		100%
9554	Burbot	Upper River	Susitna River PRM 198.9	9/7/14	6/23/15	289	84			10	1.9	0.9	198.7 ↔ 199.6				10	81.3	1.7		9.4	0.0		48.7	0.0		100%
9031	Dolly Varden	Middle/Lower DS of DC	Susitna River PRM 124.2	6/17/13	11/15/13	151	6			1			99.6 ↔ 99.6				1	59.7	1.4		8.8	0.0		14.0	0.0		100%
9060	Dolly Varden	Middle/Lower DS of DC	Talkeetna River TRM 6.3	7/14/13	7/15/13	1																					
9064	Dolly Varden	Middle/Lower DS of DC	Talkeetna River TRM 6.3	7/14/13	7/19/14	370	70			6	7.9	3.8			Talkeetna River	2.9 ↔ 6.7		61.1	0.0		7.4	0.0	6	22.6	4.0		0%
9065	Dolly Varden	Middle/Lower DS of DC	Talkeetna River TRM 6.3	7/14/13	7/24/13	10																					
9066	Dolly Varden	Middle/Lower DS of DC	Talkeetna River TRM 5.9	7/14/13	7/24/13	10																					
9067	Dolly Varden	Middle/Lower DS of DC	Talkeetna River TRM 5.9	7/14/13	9/20/13	68																					
9072	Dolly Varden	Middle/Lower DS of DC	Talkeetna River TRM 5.9	7/14/13	6/4/14	325	89			6	26.1	20	83.4 ↔ 100.5		Talkeetna River	0 ↔ 2.9	4	67.4	1.0		8.2	0.0	2	20.8	1.5		67%
9145	Dolly Varden	Middle/Lower DS of DC	Susitna River PRM 124.2	8/8/13	8/15/13	6																					
9157	Dolly Varden	Middle/Lower DS of DC	Susitna River PRM 142	8/18/13	9/1/13	14																					
9005	Humpback Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/13/13	6/13/13	0																					
9042	Humpback Whitefish	Middle/Lower DS of DC	Susitna River PRM 107	6/21/13	6/28/13	7																					
9048	Humpback Whitefish	Middle/Lower DS of DC	Susitna River PRM 107	6/21/13	7/10/13	19																					
9112	Humpback Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	7/21/13	8/31/13	41																					
9116	Humpback Whitefish	Middle/Lower DS of DC	Susitna River PRM 152.3	7/23/13	8/5/13	13																					
9117	Humpback Whitefish	Middle/Lower DS of DC	Susitna River PRM 152.3	7/23/13	8/9/13	17																					
9138	Humpback Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	7/24/13	8/12/13	18																					
9530	Lake Trout	Upper River	Tsisi Lake 1	9/5/14	5/20/15	257	51			6	0.5				Tsisi Lake 1			81.6	0.0		9.3	0.0		56.8	0.0	6	0%
9531	Lake Trout	Upper River	Tsisi Lake 1	9/5/14	6/4/15	272	44			5	0.4				Tsisi Lake 1			87.1	0.0		9.7	0.0		54.5	0.0	5	0%
9532	Lake Trout	Upper River	Tsisi Lake 1	9/5/14	6/4/15	272	31			6	0.9				Tsisi Lake 1			81.6	0.0		9.3	0.0		56.8	0.0	6	0%
9533	Lake Trout	Upper River	Tsisi Lake 1	9/5/14	6/4/15	272	63			6	1.1				Tsisi Lake 1			81.6	0.0		9.3	0.0		56.8	0.0	6	0%
9534	Lake Trout	Upper River	Tsisi Lake 1	9/5/14	6/4/15	272	85			6	0.4				Tsisi Lake 1			81.6	0.0		9.3	0.0		56.8	0.0	6	0%
9535	Lake Trout	Upper River	Tsisi Lake 1	9/5/14	6/4/15	272	100			6	1.2				Tsisi Lake 1			81.6	0.0		9.3	0.0		56.8	0.0	6	0%
9536	Lake Trout	Upper River	Tsisi Lake 1	9/5/14	6/4/15	272	94			6	0.6				Tsisi Lake 1			81.6	0.0		9.3	0.0		56.8	0.0	6	0%
9537	Lake Trout	Upper River	Tsisi Lake 1	9/5/14	6/4/15	272	76			6	0.4				Tsisi Lake 1			81.6	0.0		9.3	0.0		56.8	0.0	6	0%
9538	Lake Trout	Upper River	Tsisi Lake 1	9/5/14	6/4/15	272	64			6	0.5				Tsisi Lake 1			81.6	0.0		9.3	0.0		56.8	0.0	6	0%
9566	Lake Trout	Upper River	Sally Lake	9/9/14	6/4/15	268	83			6	0.5				Sally Lake			81.6	0.0		9.3	0.0		56.8	0.0	6	100%
9567	Lake Trout	Upper River	Tsisi Lake 1	9/9/14	6/4/15	268	66			6	0.6				Tsisi Lake 1			81.6	0.0		9.3	0.0		56.8	0.0	6	0%
9568	Lake Trout	Upper River	Tsisi Lake 1	9/9/14	11/4/14	56	9			1					Tsisi Lake 1			54.2	0.0		7.2	0.0		68.2	0.0	1	0%
9006	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 124.2	6/14/13	6/14/13	0																					
9028	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 124.2	6/17/13	8/27/14	436	1630	1	1	8	23.2	23	119.1 ↔ 142.1				8	66.7	1.3		8.1	0.0		13.4	0.0		100%
9032	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 124.2	6/17/13	9/7/13	82																					
9035	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 124.2	6/18/13	7/3/13	15																					
9036	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 124.2	6/18/13	8/16/13	59																					
9037	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 107	6/20/13	9/21/13	93																					
9038	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 107	6/20/13	7/15/13	25																					
9039	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 107	6/20/13	6/24/13	4																					
9043	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 107	6/21/13	7/3/13	12																					
9044	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 107	6/21/13	6/28/13	7																					
9045	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 107	6/21/13	6/28/13	6																					
9046	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 107	6/21/13	7/25/13	34																					
9049	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 107	6/21/13	6/26/13	5																					
9068	Longnose Sucker	Middle/Lower DS of DC	Talkeetna River TRM 5.9	7/14/13	8/2/13	19																					
9070	Longnose Sucker	Middle/Lower DS of DC	Talkeetna River TRM 5.9	7/14/13	7/24/13	10																					

Table A-5. Tag summary for individual fish during the overwintering season (Page 6 of 9).

				Overwintering Season																							
Tag ID	Species	Tagging Segment	Release Location	Release Date	Last Live Date	Days Active	Total Detections	Fixed Station Events	# Fixed Stations Detected	# Aerial Surveys Detected	Distance Traveled (RM)	Linear Home Range (mi)	Mainstem Range (PRM)	Movments Past Dam Site	Tributaries & Lakes	Tributary Range (TRM)	Mainstem Aerial Detections	Ave Mainstem Survey Length (mi)	Mainstem Selection Ratio	Confluence Aerial Detections	Ave Confluence Survey Length (mi)	Confluence Selection Ratio	Tributary Aerial Detections	Ave Tributary Survey Length (mi)	Tributary Selection Ratio	Lake Aerial Detections	% Aerial Detections in ZHI
9073	Longnose Sucker	Middle/Lower DS of DC	Talkeetna River TRM 5.9	7/14/13	7/25/13	11																					
9074	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 107	7/15/13	7/19/13	4																					
9118	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 152.3	7/23/13	8/1/13	9																					
9134	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 142.3	7/25/13	8/28/13	34																					
9135	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 142.3	7/25/13	8/1/13	7																					
9137	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 142.3	7/26/13	8/10/13	15																					
9156	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 142	8/18/13	8/30/13	12																					
9158	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 142	8/18/13	1/28/14	163	57			4	9.9	9.7	127.9 ↔ 137.6				4	57.0	1.3		7.2	0.0		8.6	0.0		100%
9160	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 117.5	8/18/13	4/8/14	233	97			7	3.7	2.6			Chulitna River	0.2 ↔ 2.8		71.0	0.0	2	9.1	3.1	5	17.8	3.9		43%
9161	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 113.8	8/19/13	12/18/13	121	25			2	1.6	1.6	104.9 ↔ 106.5				1	48.1	0.7	1	5.3	6.0		10.2	0.0		100%
9162	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 113.8	8/19/13	8/30/13	11																					
9165	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 142.3	8/29/13	9/4/13	6																					
9167	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 142	9/18/13	12/3/13	76	3238	1	1	2	3.4	2.2	142.1 ↔ 144.3				2	47.3	1.4		6.9	0.0		14.4	0.0		100%
9119	Longnose Sucker	Upper River	Tyone River TRM 0.4	7/23/13	7/23/13	0																					
9120	Longnose Sucker	Upper River	Tyone River TRM 0.4	7/23/13	7/23/13	0																					
9121	Longnose Sucker	Upper River	Tyone River TRM 0.4	7/23/13	7/27/13	4																					
9122	Longnose Sucker	Upper River	Tyone River TRM 0.4	7/23/13	8/9/13	17																					
9123	Longnose Sucker	Upper River	Tyone River TRM 0.4	7/23/13	8/20/13	28																					
9190	Longnose Sucker	Upper River	Susitna River PRM 206.7	9/19/13	9/30/13	11																					
9195	Longnose Sucker	Upper River	Susitna River PRM 206.7	9/19/13	2/19/15	518	136			16	17.7	15.2	191 ↔ 206.2				14	66.0	1.4	2	8.6	1.6		33.7	0.0		100%
9197	Longnose Sucker	Upper River	Susitna River PRM 206.7	9/19/13	11/12/13	54	5			1			205.5 ↔ 205.5				1	16.2	1.7		3.7	0.0		8.2	0.0		100%
9199	Longnose Sucker	Upper River	Susitna River PRM 206.7	9/19/13	11/4/14	411	9662	1	1	11	3.8	11.6	209.2 ↔ 220.8				10	61.2	1.5	1	8.5	1.1		29.1	0.0		100%
9200	Longnose Sucker	Upper River	Susitna River PRM 198.1	9/20/13	7/17/14	300	60			9	4.8	4.6	192.2 ↔ 196.8				7	56.9	1.2	2	8.3	2.3		19.3	0.0		100%
9339	Longnose Sucker	Upper River	Watana Creek TRM 0.1	6/6/14	6/17/14	11																					
9340	Longnose Sucker	Upper River	Watana Creek TRM 0.1	6/6/14	8/7/14	62																					
9341	Longnose Sucker	Upper River	Watana Creek TRM 0.1	6/6/14	7/15/14	39																					
9342	Longnose Sucker	Upper River	Watana Creek TRM 0.1	6/6/14	7/9/14	33																					
9347	Longnose Sucker	Upper River	Watana Creek TRM 0.1	6/6/14	8/5/14	60																					
9348	Longnose Sucker	Upper River	Watana Creek TRM 0.1	6/6/14	8/7/14	62																					
9354	Longnose Sucker	Upper River	Susitna River PRM 203.5	6/6/14	12/16/14	193	23			5	3.6	2.4	199.1 ↔ 201.5				5	70.2	1.8		8.4	0.0		49.9	0.0		100%
9356	Longnose Sucker	Upper River	Susitna River PRM 203.5	6/7/14	8/18/14	72																					
9368	Longnose Sucker	Upper River	Susitna River PRM 206.7	6/7/14	11/12/14	158	10048	2	2	2	24	24	167 ↔ 191	1 ↓			2	50.1	1.7		7.2	0.0		27.9	0.0		100%
9370	Longnose Sucker	Upper River	Susitna River PRM 206.7	6/7/14	11/4/14	150	14			3	1.1	0.7	199.8 ↔ 200.5				3	66.8	2.0		9.1	0.0		59.2	0.0		100%
9371	Longnose Sucker	Upper River	Susitna River PRM 206.7	6/7/14	10/2/14	117	3			1			192.3 ↔ 192.3				1	72.1	1.7		9.6	0.0		41.9	0.0		100%
9372	Longnose Sucker	Upper River	Susitna River PRM 206.7	6/7/14	11/4/14	150	21	1	1	3	2	1.6	197 ↔ 198.6				3	66.8	2.0		9.1	0.0		59.2	0.0		100%
9375	Longnose Sucker	Upper River	Susitna River PRM 196.4	6/7/14	10/14/14	129	5			2	1	1	192 ↔ 193				2	73.1	1.9		10.1	0.0		54.8	0.0		100%
9376	Longnose Sucker	Upper River	Susitna River PRM 196.4	6/7/14	10/2/14	117	16			1			189.1 ↔ 189.1					72.1	0.0	1	9.6	12.9		41.9	0.0		100%
9377	Longnose Sucker	Upper River	Susitna River PRM 196.4	6/7/14	12/3/14	179	27			3	1.1	1.1	196.9 ↔ 197.9		Watana Creek	0 ↔ 0.1	1	66.5	0.6	2	8.0	10.7		54.2	0.0		100%
9384	Longnose Sucker	Upper River	Watana Creek TRM 0.1	6/8/14	6/4/15	361	72			12	7	5	193.8 ↔ 198.5		Watana Creek	0 ↔ 0.3	9	82.1	1.3	2	9.5	2.5	1	49.2	0.2		100%
9388	Longnose Sucker	Upper River	Susitna River PRM 198.9	6/8/14	10/2/14	116	94	1	1	1	2	2	185.2 ↔ 187.2	1 ↓			1	72.1	1.7		9.6	0.0		41.9	0.0		100%
9500	Longnose Sucker	Upper River	Susitna River PRM 247.3	9/2/14	12/16/14	105	49			4	1.7	1.6	247.3 ↔ 248.8		Tyone River	0 ↔ 0.1	2	74.2	0.9	2	8.8	7.3		45.3	0.0		0%
9501	Longnose Sucker	Upper River	Susitna River PRM 247.3	9/2/14	6/23/15	294	99			9	1.6	0.6	250.5 ↔ 251.1				9	87.2	1.6		9.6	0.0		45.9	0.0		0%
9502	Longnose Sucker	Upper River	Susitna River PRM 247.3	9/2/14	9/2/14	0																					
9503	Longnose Sucker	Upper River	Susitna River PRM 247.3	9/2/14	12/3/14	92	43			4	3	2.5	246.4 ↔ 248.9				4	67.9	1.9		8.4	0.0		51.2	0.0		0%
9504	Longnose Sucker	Upper River	Susitna River PRM 247.3	9/2/14	9/2/14	0																					
9507	Longnose Sucker	Upper River	Susitna River PRM 247	9/2/14	6/23/15	294	107			9	0.6	0.2	250.6 ↔ 250.8				9	87.2	1.6		9.6	0.0		45.9	0.0		0%
9508	Longnose Sucker	Upper River	Susitna River PRM 247	9/2/14	9/10/14	7																					
9509	Longnose Sucker	Upper River	Susitna River PRM 247	9/2/14	9/17/14	15																					
9510	Longnose Sucker	Upper River	Susitna River PRM 247	9/2/14	11/4/14	63	4595	1	1	3	12.7	12.4	206.1 ↔ 218.2		Jay Creek	0 ↔ 0.3	1	66.8	0.7	1	9.1	4.9	1	59.2	0.8		100%
9513	Longnose Sucker	Upper River	Susitna River PRM 247.3	9/3/14	9/3/14	0																					

Table A-5. Tag summary for individual fish during the overwintering season (Page 7 of 9).

				Overwintering Season																						
Tag ID	Species	Tagging Segment	Release Location	Release Date	Last Live Date	Days Active	Total Detections	Fixed Station Events	# Fixed Stations Detected	# Aerial Surveys Detected	Distance Traveled (RM)	Linear Home Range (mi)	Mainstem Range (PRM)	Movments Past Dam Site	Tributaries & Lakes	Tributary Range (TRM)	Mainstem Aerial Detections	Ave Mainstem Survey Length (mi)	Mainstem Selection Ratio	Confluence Aerial Detections	Ave Confluence Survey Length (mi)	Confluence Selection Ratio	Tributary Aerial Detections	Ave Tributary Survey Length (mi)	Tributary Selection Ratio	Lake Aerial Detections	% Aerial Detections in ZHI
9525	Longnose Sucker	Upper River	Susitna River PRM 213.6	9/4/14	11/4/14	61	5950	2	1	3	5.8	4.4	206.3 ↔ 210.7				1	66.8	0.7	2	9.1	9.9		59.2	0.0		100%
9540	Longnose Sucker	Upper River	Watana Creek TRM 0.1	9/6/14	11/5/14	60	4987	1	1	3	6.7	6.7	186.3 ↔ 193	1 ↓			3	58.1	1.9		8.3	0.0		41.1	0.0		100%
9542	Longnose Sucker	Upper River	Susitna River PRM 192.7	9/6/14	10/14/14	38	2			1			193.3 ↔ 193.3				1	74.0	2.1		10.5	0.0		67.6	0.0		100%
9550	Longnose Sucker	Upper River	Susitna River PRM 198.9	9/7/14	9/22/14	15																				
9555	Longnose Sucker	Upper River	Susitna River PRM 198.9	9/7/14	6/23/15	289	91			12	3.8	1.6	194.5 ↔ 196.1				7	82.1	1.0	5	9.5	6.2		49.2	0.0		100%
9558	Longnose Sucker	Upper River	Susitna River PRM 198.9	9/7/14	6/23/15	289	132			12	8.1	2.7	196.7 ↔ 199.4				9	82.1	1.3	3	9.5	3.7		49.2	0.0		100%
9559	Longnose Sucker	Upper River	Susitna River PRM 198.9	9/7/14	9/17/14	10																				
9151	Northern Pike	Middle/Lower DS of DC	Fish Creek (Krotz) TRM 3.3	8/16/13	10/29/14	439	70			10	1.2	0.9			Fish Creek (Krotz)	3.3 ↔ 4.2		69.7	0.0		5.9	0.0	10	13.4	6.7		0%
9152	Northern Pike	Middle/Lower DS of DC	Fish Creek (Krotz) TRM 3.3	8/16/13	5/14/14	271																				
9153	Northern Pike	Middle/Lower DS of DC	Fish Creek (Krotz) TRM 3.3	8/16/13	1/7/14	144	33			3	0.8	0.8			Fish Creek (Krotz)	3.8 ↔ 4.6		72.6	0.0		6.6	0.0	3	6.7	12.8		0%
9154	Northern Pike	Middle/Lower DS of DC	Fish Creek (Krotz) TRM 3.3	8/16/13	8/16/13	0																				
9155	Northern Pike	Middle/Lower DS of DC	Fish Creek (Krotz) TRM 3.3	8/16/13	4/8/14	235	92			7	1.5	0.5			Fish Creek (Krotz)	3.7 ↔ 4.2		69.7	0.0		6.4	0.0	7	11.4	7.6		0%
9008	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 124.2	6/14/13	9/2/14	445	80			9	6.1	5.8	113.6 ↔ 119.4				9	65.9	1.3		8.1	0.0		13.4	0.0		100%
9017	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 134.3	6/16/13	8/12/13	57																				
9018	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 134.3	6/16/13	4/30/14	318	86			8	6.8	3.5	131.4 ↔ 134.9				8	54.8	1.4		7.2	0.0		13.7	0.0		100%
9019	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 134.3	6/16/13	9/3/13	79																				
9021	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 124.2	6/16/13	4/30/14	318	41			7	9.7	9.1	118.9 ↔ 128				7	70.2	1.3		8.4	0.0		12.4	0.0		100%
9022	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 124.2	6/16/13	9/3/13	79																				
9026	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 124.2	6/17/13	7/30/13	43																				
9040	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 124.2	6/20/13	4/8/14	292	42			5	7.6	6.6	122.8 ↔ 129.4				5	76.8	1.3		8.8	0.0		16.4	0.0		100%
9041	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 124.2	6/21/13	8/25/13	65																				
9051	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 124.2	6/24/13	5/21/14	331	617	1	1	7	6.3	2.9	102.9 ↔ 105.8				6	69.4	1.1	1	8.4	1.6		15.3	0.0		100%
9052	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 124.2	6/25/13	7/24/13	29																				
9054	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 134.3	7/9/13	9/21/14	439	70			9	2.9	2.7	129.7 ↔ 132.4				9	55.3	1.4		7.4	0.0		13.7	0.0		100%
9055	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 134.3	7/9/13	9/8/13	61																				
9056	Rainbow Trout	Middle/Lower DS of DC	Talkeetna River TRM 6.3	7/14/13	9/30/14	443	54			7	0.9	0.7	102.8 ↔ 103.5				7	59.4	1.3		7.7	0.0		12.1	0.0		100%
9057	Rainbow Trout	Middle/Lower DS of DC	Talkeetna River TRM 6.3	7/14/13	8/23/13	40																				
9058	Rainbow Trout	Middle/Lower DS of DC	Talkeetna River TRM 6.3	7/14/13	8/2/13	19																				
9059	Rainbow Trout	Middle/Lower DS of DC	Talkeetna River TRM 6.3	7/14/13	8/9/13	26																				
9061	Rainbow Trout	Middle/Lower DS of DC	Talkeetna River TRM 6.3	7/14/13	8/19/14	401	78			5	0.1	0.1			Chulitna River	6.1 ↔ 6.2		69.5	0.0		8.0	0.0	5	25.0	4.1		0%
9062	Rainbow Trout	Middle/Lower DS of DC	Talkeetna River TRM 6.3	7/14/13	8/2/13	19																				
9063	Rainbow Trout	Middle/Lower DS of DC	Talkeetna River TRM 6.3	7/14/13	8/30/13	47																				
9071	Rainbow Trout	Middle/Lower DS of DC	Talkeetna River TRM 5.9	7/14/13	7/24/13	10																				
9075	Rainbow Trout	Middle/Lower DS of DC	Montana Creek TRM 2.3	7/15/13	8/23/13	39																				
9076	Rainbow Trout	Middle/Lower DS of DC	Montana Creek TRM 2.3	7/15/13	8/1/13	17																				
9077	Rainbow Trout	Middle/Lower DS of DC	Montana Creek TRM 2.3	7/15/13	8/9/13	25																				
9078	Rainbow Trout	Middle/Lower DS of DC	Montana Creek TRM 2.3	7/15/13	8/9/13	25																				
9079	Rainbow Trout	Middle/Lower DS of DC	Montana Creek TRM 2.3	7/15/13	2/4/15	569	115			13	5.6	5.6	80.5 ↔ 85.3		Montana Creek	0 ↔ 0.8	9	79.0	1.1	1	9.5	1.0	3	33.8	0.8		62%
9080	Rainbow Trout	Middle/Lower DS of DC	Montana Creek TRM 2.3	7/15/13	8/17/13	33																				
9133	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 142	7/25/13	8/31/13	37																				
9146	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 124.2	8/16/13	8/29/13	13																				
9159	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 142	8/18/13	8/31/13	13																				
9166	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 142.3	8/29/13	11/3/13	66																				
9168	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 142	9/18/13	9/24/13	6																				
9169	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 142	9/18/13	9/24/13	6																				
9228	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 134.3	9/25/13	7/14/14	292	45			8	1.8	0.8	136.8 ↔ 137.6				8	57.9	1.4		7.7	0.0		13.6	0.0		100%
9237	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 142	9/25/13	4/23/15	575	6942	3	1	18	8.1	3.5	138.6 ↔ 142.1				14	48.8	1.2	4	6.7	2.6		21.4	0.0		100%
9238	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 142	9/25/13	6/3/15	616	127			14	8.9	2.6	136.7 ↔ 139.3				14	52.9	1.6		7.1	0.0		22.9	0.0		100%
9239	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 142	9/25/13	7/6/15	649	102			16	12.8	7.3	134 ↔ 141.2		Fourth of July Creek	0 ↔ 0.1	12	52.6	1.2	4	7.2	2.9		23.8	0.0		88%
9242	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 80.9	9/27/13	2/4/15	495	152			12	12.5	9.1	79.8 ↔ 88.8		Montana Creek	0 ↔ 0.1	6	75.9	0.8	6	9.4	6.3		32.1	0.0		67%

Table A-5. Tag summary for individual fish during the overwintering season (Page 8 of 9).

Overwintering Season																												
Tag ID	Species	Tagging Segment	Release Location	Release Date	Last Live Date	Days Active	Total Detections	Fixed Station Events	# Fixed Stations Detected	# Aerial Surveys Detected	Distance Traveled (RM)	Linear Home Range (mi)	Mainstem Range (PRM)	Movments Past Dam Site	Tributaries & Lakes	Tributary Range (TRM)	Mainstem Aerial Detections	Ave Mainstem Survey Length (mi)	Mainstem Selection Ratio	Confluence Aerial Detections	Ave Confluence Survey Length (mi)	Confluence Selection Ratio	Tributary Aerial Detections	Ave Tributary Survey Length (mi)	Tributary Selection Ratio	Lake Aerial Detections	% Aerial Detections in ZHI
9243	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 80.9	9/27/13	7/6/15	647	100			13	26.5	26.5	80.9 ↔ 106.3		Montana Creek	0 ↔ 1.1	11	75.2	1.3	1	9.0	1.0	1	30.7	0.3		85%
9244	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 80.9	9/28/13	8/19/14	325	23			5	3.8	2.8	76 ↔ 78.8				4	79.7	1.1	1	9.6	2.3		21.0	0.0		0%
9247	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 80.9	9/28/13	10/29/14	396	146			11	12.2	10.6	69.9 ↔ 80.5				10	76.2	1.4	1	8.5	1.2		31.4	0.0		0%
9248	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 80.9	9/28/13	8/22/14	328	175			7	7.6	5.3	71.9 ↔ 77.2				7	74.8	1.3		8.3	0.0		16.1	0.0		0%
9249	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 80.9	9/28/13	12/17/14	445	179			14	5.4	3.3	80 ↔ 83.1		Montana Creek	0 ↔ 0.2	11	73.1	1.3	3	8.8	2.9		37.9	0.0		93%
9250	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 80.9	9/28/13	8/28/14	334	143			8	3.1	1.6	87.2 ↔ 88.8				4	73.8	0.7	4	8.7	5.7		17.1	0.0		100%
9009	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/14/13	6/26/13	12																					
9011	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/14/13	5/24/14	343	162			7	6.7	6.5	116.7 ↔ 123.2				3	69.4	0.6	4	8.4	6.4		15.3	0.0		100%
9012	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/14/13	9/20/13	98																					
9013	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/15/13	12/3/13	171	4			2	0.5	0.5	129.9 ↔ 130.4				2	47.3	1.4		6.9	0.0		14.4	0.0		100%
9023	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/16/13	9/8/13	84																					
9024	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/16/13	10/2/13	108																					
9025	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/16/13	2/18/14	247	43			6	10	9.6	123.3 ↔ 132.9				6	57.0	1.3		7.7	0.0		11.2	0.0		100%
9027	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/17/13	9/13/13	88																					
9030	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/17/13	10/9/13	114																					
9033	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/18/13	9/3/13	77																					
9034	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/18/13	9/20/13	94																					
9053	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	7/7/13	8/17/14	406	37			7	80	43.4	56.9 ↔ 100.3				6	57.9	1.3	1	7.4	1.7		21.0	0.0		71%
9069	Round Whitefish	Middle/Lower DS of DC	Talkeetna River TRM 5.9	7/14/13	8/16/13	33																					
9136	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 142.3	7/26/13	7/31/13	5																					
9229	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 134.3	9/25/13	4/8/14	195	117			8	61.3	35.3	98.9 ↔ 134.2				7	68.2	1.2	1	8.4	1.4		14.4	0.0		100%
9230	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 134.3	9/25/13	2/19/14	147	25			6	54.8	54.8	81.5 ↔ 136.3				5	56.4	1.1	1	7.2	1.7		8.6	0.0		100%
9231	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 134.3	9/25/13	5/30/14	247	114			9	25.3	20.7	104.4 ↔ 125.1				7	67.4	1.0	2	8.1	2.4		12.4	0.0		100%
9232	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 134.3	9/25/13	7/2/14	280	158			8	9.8	6.9	98.2 ↔ 105.1				2	72.3	0.3	6	8.8	8.2		15.0	0.0		100%
9233	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 134.3	9/25/13	4/30/14	217	74			7	7.8	4.1	130.9 ↔ 134.3		Fourth of July Creek	0 ↔ 0.7	6	57.6	1.2		7.5	0.0	1	13.5	0.8		86%
9234	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 134.3	9/25/13	12/16/13	82	23			3	1.3	1.3	132.7 ↔ 134				2	47.4	0.9	1	6.6	3.2		9.6	0.0		100%
9235	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 142	9/25/13	4/23/15	575	531	1	1	14	6.2	4.9	137.2 ↔ 142.1				14	53.4	1.5		7.3	0.0		17.5	0.0		100%
9178	Round Whitefish	Upper River	Watana Creek TRM 0.1	9/18/13	12/18/13	91	17			3	0.7	0.7	189.8 ↔ 190.5				3	32.7	1.5		6.0	0.0		11.6	0.0		100%
9180	Round Whitefish	Upper River	Watana Creek TRM 0.1	9/18/13	10/7/13	19																					
9183	Round Whitefish	Upper River	Watana Creek TRM 0.1	9/18/13	12/2/13	75	7			1			202.3 ↔ 202.3				1	39.2	2.0		8.2	0.0		31.0	0.0		100%
9193	Round Whitefish	Upper River	Susitna River PRM 206.7	9/19/13	9/24/14	370	51			9	8.5	8.2	180.8 ↔ 189	1 ↓			9	57.3	1.5		8.2	0.0		18.8	0.0		100%
9196	Round Whitefish	Upper River	Susitna River PRM 206.7	9/19/13	10/26/13	36																					
9198	Round Whitefish	Upper River	Susitna River PRM 206.7	9/19/13	6/4/15	623	78			17	21.8	9.5	178.2 ↔ 187.7	1 ↓			10	65.1	0.9	7	8.3	5.0		27.6	0.0		100%
9201	Round Whitefish	Upper River	Susitna River PRM 198.1	9/20/13	4/30/14	222	125			9	30.8	21.8	187.6 ↔ 209.4				7	56.9	1.2	2	8.3	2.3		19.3	0.0		100%
9202	Round Whitefish	Upper River	Susitna River PRM 198.1	9/20/13	11/13/13	54	4			1			192.3 ↔ 192.3				1	19.8	1.3		2.9	0.0		3.9	0.0		100%
9203	Round Whitefish	Upper River	Susitna River PRM 203.5	9/20/13	3/25/15	551	93			9	18.7	18.7	185.1 ↔ 203.8	1 ↓			7	69.8	1.1	2	9.0	2.5		22.4	0.0		100%
9204	Round Whitefish	Upper River	Susitna River PRM 203.5	9/20/13	12/18/13	89	35			3	0.6	0.5	197.8 ↔ 198.3				2	31.5	1.1	1	6.3	2.7		13.1	0.0		100%
9207	Round Whitefish	Upper River	Susitna River PRM 201.4	9/21/13	1/6/14	107	22			3	0.5	0.5	186.2 ↔ 186.7	1 ↓			3	46.3	1.5		7.8	0.0		16.3	0.0		100%
9208	Round Whitefish	Upper River	Susitna River PRM 201.4	9/21/13	8/30/14	343	96			8	12.9	8.8	191.8 ↔ 200.6				7	54.7	1.4	1	8.2	1.3		21.7	0.0		100%
9213	Round Whitefish	Upper River	Goose Creek TRM 0.1	9/22/13	10/29/13	37																					
9218	Round Whitefish	Upper River	Susitna River PRM 206.7	9/23/13	11/13/13	51	5			1			190.9 ↔ 190.9				1	19.8	1.3		2.9	0.0		3.9	0.0		100%
9219	Round Whitefish	Upper River	Susitna River PRM 206.7	9/23/13	1/28/14	127	97			5	10.5	8	184.3 ↔ 192.3	1 ↓			5	43.9	1.5		6.9	0.0		15.6	0.0		100%
9220	Round Whitefish	Upper River	Susitna River PRM 206.7	9/23/13	1/6/14	105	39			4	4.3	4	199.8 ↔ 203.8				4	38.8	1.5		6.8	0.0		14.3	0.0		100%
9221	Round Whitefish	Upper River	Susitna River PRM 206.7	9/23/13	2/17/14	147	47			5	14.9	14.3	191.5 ↔ 205.8				5	50.1	1.3		7.1	0.0		10.3	0.0		100%
9223	Round Whitefish	Upper River	Susitna River PRM 196.4	9/23/13	11/13/13	51	2			1			191.6 ↔ 191.6				1	19.8	1.3		2.9	0.0		3.9	0.0		100%
9344	Round Whitefish	Upper River	Watana Creek TRM 0.1	6/6/14	6/23/15	382	72			9	8.9	6.1	193.6 ↔ 199.7				9	82.9	1.7		9.3	0.0		51.2	0.0		100%
9346	Round Whitefish	Upper River	Watana Creek TRM 0.1	6/6/14	7/25/14	49																					
9369	Round Whitefish	Upper River	Susitna River PRM 206.7	6/7/14	9/17/14	102																					
9385	Round Whitefish	Upper River	Watana Creek TRM 0.1	6/8/14	6/23/15	380	76			7	6.3	3.9	195.4 ↔ 199.3				4	83.2	1.0	3	9.5	6.5		51.5	0.0		100%
9387	Round Whitefish	Upper River	Susitna River PRM 198.9	6/8/14	9/5/14	89																					

Table A-5. Tag summary for individual fish during the overwintering season (Page 9 of 9).

				Overwintering Season																							
Tag ID	Species	Tagging Segment	Release Location	Release Date	Last Live Date	Days Active	Total Detections	Fixed Station Events	# Fixed Stations Detected	# Aerial Surveys Detected	Distance Traveled (RM)	Linear Home Range (mi)	Mainstem Range (PRM)	Movments Past Dam Site	Tributaries & Lakes	Tributary Range (TRM)	Mainstem Aerial Detections	Ave Mainstem Survey Length (mi)	Mainstem Selection Ratio	Confluence Aerial Detections	Ave Confluence Survey Length (mi)	Confluence Selection Ratio	Tributary Aerial Detections	Ave Tributary Survey Length (mi)	Tributary Selection Ratio	Lake Aerial Detections	% Aerial Detections in ZHI
9389	Round Whitefish	Upper River	Susitna River PRM 198.9	6/8/14	6/4/15	361	65			10	8.1	4.1	196.4 ↔ 200.5				5	83.9	0.8	5	9.4	7.5		48.1	0.0		100%
9390	Round Whitefish	Upper River	Susitna River PRM 198.9	6/8/14	6/23/15	380	87			10	17.5	14.9	177.1 ↔ 192	1 ↓			7	67.0	1.2	3	7.9	4.2		35.6	0.0		100%
9505	Round Whitefish	Upper River	Susitna River PRM 247.3	9/2/14	10/14/14	42																					
9506	Round Whitefish	Upper River	Susitna River PRM 247.3	9/2/14	10/14/14	42																					
9524	Round Whitefish	Upper River	Susitna River PRM 213.6	9/4/14	1/6/15	124	49			4	23.1	23.1	195.9 ↔ 219				2	74.4	0.9	2	8.1	8.1		48.6	0.0		100%
9526	Round Whitefish	Upper River	Susitna River PRM 206.7	9/4/14	6/4/15	273	63			10	3.6	1.7	204.7 ↔ 206.4				8	83.9	1.3	2	9.4	3.0		48.1	0.0		100%
9527	Round Whitefish	Upper River	Susitna River PRM 206.7	9/4/14	6/4/15	273	59			10	9.1	5.1	195.4 ↔ 200.5				8	83.9	1.3	2	9.4	3.0		48.1	0.0		100%
9528	Round Whitefish	Upper River	Susitna River PRM 206.7	9/4/14	6/23/15	292	146			10	4.8	2.2	195.4 ↔ 197.6				4	83.9	0.7	6	9.4	9.0		48.1	0.0		100%
9529	Round Whitefish	Upper River	Susitna River PRM 206.7	9/4/14	2/19/15	168	87			6	14.4	14.4	196.6 ↔ 211				3	78.3	0.9	3	8.7	7.8		49.7	0.0		100%
9543	Round Whitefish	Upper River	Susitna River PRM 206.7	9/6/14	10/14/14	38																					
9544	Round Whitefish	Upper River	Susitna River PRM 206.7	9/6/14	10/2/14	26																					
9545	Round Whitefish	Upper River	Susitna River PRM 198.9	9/6/14	6/23/15	290	43			9	1.7	1.2	190.1 ↔ 191.3				9	82.4	1.6		9.4	0.0		43.2	0.0		100%
9551	Round Whitefish	Upper River	Susitna River PRM 198.9	9/7/14	1/6/15	121	11			3	1.5	1.5	192.1 ↔ 193.6				3	75.5	1.9		8.7	0.0		55.8	0.0		100%
9552	Round Whitefish	Upper River	Susitna River PRM 198.9	9/7/14	10/14/14	37																					
9553	Round Whitefish	Upper River	Susitna River PRM 198.9	9/7/14	10/16/14	39																					
9556	Round Whitefish	Upper River	Susitna River PRM 198.9	9/7/14	12/17/14	101	9			1			148.4 ↔ 148.4					80.5	0.0	1	12.0	13.7		71.5	0.0		100%
9557	Round Whitefish	Upper River	Susitna River PRM 198.9	9/7/14	9/22/14	15																					
9560	Round Whitefish	Upper River	Susitna River PRM 198.9	9/7/14	10/9/14	32																					

Table A-6. Tag summary for individual fish during the spawning season (Page 1 of 9).

				Spawning Season																								
Tag ID	Species	Tagging Segment	Release Location	Release Date	Last Live Date	Days Active	Total Detections	Fixed Station Events	# Fixed Stations Detected	# Aerial Surveys Detected	Distance Traveled (RM)	Linear Home Range (mi)	Mainstem Range (PRM)	Movments Past Dam Site	Tributaries & Lakes	Tributary Range (TRM)	Mainstem Aerial Detections	Mainstem Survey Length (mi)	Mainstem Selection Ratio	Confluence Aerial Detections	Ave Confluence Survey Length (mi)	Confluence Selection Ratio	Tributary Aerial Detections	Ave Tributary Survey Length (mi)	Tributary Selection Ratio	Lake Aerial Detections	% Aerial Detections in ZHI
9001	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 124.2	6/13/13	7/28/13	45																						
9002	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 124.2	6/13/13	7/25/14	407	20			2	57.2	57.2	49.9 ↔ 107.1				2	90.0	1.4		9.6	0.0		24.3	0.0		50%
9003	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 124.2	6/13/13	8/27/13	75																						
9004	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 124.2	6/13/13	10/28/14	502	6			1			85.2 ↔ 85.2				1	117.1	1.3		10.7	0.0		22.5	0.0		100%
9007	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 124.2	6/14/13	7/9/13	25																						
9010	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 124.2	6/14/13	7/13/13	28																						
9014	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 124.2	6/15/13	3/25/15	648	8			1			81.7 ↔ 81.7				1	117.1	1.3		10.7	0.0		22.5	0.0		100%
9015	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 124.2	6/16/13	8/10/13	55																						
9016	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 124.2	6/16/13	12/17/14	549																						
9020	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 124.2	6/16/13	8/12/13	57																						
9029	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 124.2	6/17/13	8/10/13	54																						
9115	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 152.3	7/23/13	8/27/13	35																						
9170	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 134.3	9/19/13	10/13/13	23																						
9227	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 134.3	9/25/13	10/22/13	27																						
9236	Arctic Grayling	Middle/Lower DS of DC	Susitna River PRM 142	9/25/13	5/29/14	246	19			2	2.7	2.7	127.9 ↔ 130.6				2	34.8	1.6		5.2	0.0		15.5	0.0		100%
9091	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	7/18/13	7/23/13	5																						
9092	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	7/18/13	8/13/13	26																						
9093	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	7/18/13	9/23/13	67																						
9094	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	7/18/13	9/30/13	74																						
9095	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	7/18/13	10/15/13	89																						
9096	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	7/18/13	10/2/13	76																						
9097	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	7/18/13	8/20/13	33																						
9098	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	7/18/13	9/16/13	60																						
9124	Arctic Grayling	Middle/Lower US of DC	Susitna River PRM 179.4	7/24/13	6/28/14	339	14			2	1.8	1.8	180.8 ↔ 182.6				2	74.0	1.4		10.0	0.0		18.3	0.0		100%
9125	Arctic Grayling	Middle/Lower US of DC	Susitna River PRM 179.4	7/24/13	12/18/13	147																						
9126	Arctic Grayling	Middle/Lower US of DC	Susitna River PRM 179.4	7/24/13	5/12/14	292	82	1	1	2	26	26	142.1 ↔ 168.1				2	74.0	1.4		10.0	0.0		18.3	0.0		100%
9127	Arctic Grayling	Middle/Lower US of DC	Susitna River PRM 179.4	7/24/13	9/7/13	45																						
9128	Arctic Grayling	Middle/Lower US of DC	Susitna River PRM 179.4	7/24/13	12/18/13	147																						
9129	Arctic Grayling	Middle/Lower US of DC	Susitna River PRM 179.4	7/24/13	10/21/13	89																						
9130	Arctic Grayling	Middle/Lower US of DC	Susitna River PRM 179.4	7/24/13	12/18/13	147																						
9131	Arctic Grayling	Middle/Lower US of DC	Susitna River PRM 179.4	7/24/13	11/13/13	112																						
9164	Arctic Grayling	Middle/Lower US of DC	Susitna River PRM 175	8/21/13	8/21/13	0																						
9240	Arctic Grayling	Middle/Lower US of DC	Susitna River PRM 179.4	9/26/13	9/5/14	344	14			2	0.1	0.1	174.6 ↔ 174.7				2	74.0	1.4		10.0	0.0		18.3	0.0		100%
9241	Arctic Grayling	Middle/Lower US of DC	Susitna River PRM 179.4	9/26/13	12/2/13	67																						
9381	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	6/8/14	6/23/15	380	28			2	19	19	233 ↔ 247.3		Tyone River	0 ↔ 4.7		91.9	0.0	1	10.3	3.9	1	70.6	1.2		0%
9382	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	6/8/14	7/14/14	36																						
9406	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	6/9/14	7/10/14	31																						
9407	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	6/9/14	6/23/15	379	16			2	19	19	200 ↔ 219	1 ↑			2	91.9	1.9		10.3	0.0		70.6	0.0		100%
9408	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	6/9/14	6/23/15	379	10			2	0	0			Tyone River	10.5 ↔ 10.5		91.9	0.0		10.3	0.0	2	70.6	2.4		0%
9409	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	6/9/14	9/17/14	100																						
9410	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	6/9/14	7/10/14	31																						
9411	Arctic Grayling	Middle/Lower US of DC	Tsusena Creek TRM 0.1	6/9/14	6/23/15	379	8			2	17.5	17.5	223.8 ↔ 241.3				2	91.9	1.9		10.3	0.0		70.6	0.0		50%
9081	Arctic Grayling	Upper River	Oshetna River TRM 18.3	7/17/13	2/17/14	215																						
9082	Arctic Grayling	Upper River	Oshetna River TRM 18.3	7/17/13	9/2/13	47																						
9083	Arctic Grayling	Upper River	Oshetna River TRM 21.7	7/17/13	10/18/13	93																						
9084	Arctic Grayling	Upper River	Oshetna River TRM 21.7	7/17/13	10/7/13	82																						
9085	Arctic Grayling	Upper River	Oshetna River TRM 21.7	7/17/13	6/29/14	347	11			1			246.3 ↔ 246.3				1	74.0	1.4		10.1	0.0		17.8	0.0		0%
9086	Arctic Grayling	Upper River	Oshetna River TRM 21.7	7/17/13	6/23/15	706	35			3	10.3	10.3			Tyone River	2.7 ↔ 13		85.9	0.0		10.2	0.0	3	53.0	2.8		0%
9087	Arctic Grayling	Upper River	Oshetna River TRM 21.7	7/17/13	7/17/13	0																						
9088	Arctic Grayling	Upper River	Oshetna River TRM 21.7	7/17/13	7/17/13	0																						

Table A-6. Tag summary for individual fish during the spawning season (Page 2 of 9).

				Spawning Season																							
Tag ID	Species	Tagging Segment	Release Location	Release Date	Last Live Date	Days Active	Total Detections	Fixed Station Events	# Fixed Stations Detected	# Aerial Surveys Detected	Distance Traveled (RM)	Linear Home Range (mi)	Mainstem Range (PRM)	Movments Past Dam Site	Tributaries & Lakes	Tributary Range (TRM)	Mainstem Aerial Detections	Mainstem Survey Length (mi)	Mainstem Selection Ratio	Confluence Aerial Detections	Ave Confluence Survey Length (mi)	Confluence Selection Ratio	Tributary Aerial Detections	Ave Tributary Survey Length (mi)	Tributary Selection Ratio	Lake Aerial Detections	% Aerial Detections in ZHI
9089	Arctic Grayling	Upper River	Susitna River PRM 189.5	7/18/13	9/2/13	46																					
9090	Arctic Grayling	Upper River	Susitna River PRM 189.5	7/18/13	7/26/13	8																					
9099	Arctic Grayling	Upper River	Watana Creek TRM 0.1	7/18/13	5/20/14	306	24			2	4.1	4.1	194.5 ↔ 198.6				1	74.0	0.7	1	10.0	1.4		18.3	0.0		100%
9100	Arctic Grayling	Upper River	Watana Creek TRM 0.1	7/18/13	12/2/13	137																					
9101	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	7/19/13	10/9/13	82																					
9102	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	7/19/13	9/30/13	73																					
9103	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	7/19/13	7/31/13	12																					
9104	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	7/19/13	9/9/13	52																					
9105	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	7/19/13	8/20/13	32																					
9106	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	7/19/13	8/26/13	38																					
9107	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	7/19/13	6/29/14	345	9870	1	1	2	8.7	5.3	207.3 ↔ 212.6	1 ↑			2	74.0	1.4		10.0	0.0		18.3	0.0		100%
9108	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	7/19/13	9/24/13	67																					
9109	Arctic Grayling	Upper River	Goose Creek TRM 0.3	7/22/13	7/31/13	9																					
9110	Arctic Grayling	Upper River	Goose Creek TRM 0.3	7/22/13	8/6/13	15																					
9111	Arctic Grayling	Upper River	Goose Creek TRM 0.1	7/22/13	8/13/13	22																					
9113	Arctic Grayling	Upper River	Clearwater Creek TRM 0.9	7/22/13	7/22/13	0																					
9114	Arctic Grayling	Upper River	Clearwater Creek TRM 0.9	7/22/13	11/11/13	112																					
9132	Arctic Grayling	Upper River	Watana Creek TRM 0.1	7/25/13	8/6/13	12																					
9139	Arctic Grayling	Upper River	Susitna River PRM 189.5	7/27/13	8/26/13	30																					
9140	Arctic Grayling	Upper River	Susitna River PRM 189.5	7/27/13	9/16/13	51																					
9141	Arctic Grayling	Upper River	Susitna River PRM 189.5	7/27/13	1/28/14	185																					
9142	Arctic Grayling	Upper River	Susitna River PRM 189.5	7/27/13	4/30/14	277	25			2	0.3	0.3	172.7 ↔ 173				2	74.0	1.4		10.0	0.0		18.3	0.0		100%
9143	Arctic Grayling	Upper River	Susitna River PRM 189.5	7/27/13	5/20/14	297	7			2	27.8	27.8	187.7 ↔ 215.5	1 ↑			2	74.0	1.4		10.0	0.0		18.3	0.0		100%
9163	Arctic Grayling	Upper River	Susitna River PRM 203.5	8/20/13	5/20/14	273	17			2	0.5	0.5	174.2 ↔ 174.7				2	74.0	1.4		10.0	0.0		18.3	0.0		100%
9171	Arctic Grayling	Upper River	Watana Creek TRM 0.1	9/18/13	5/20/14	244	16			2	0.1	0.1	185 ↔ 185.1				2	74.0	1.4		10.0	0.0		18.3	0.0		100%
9172	Arctic Grayling	Upper River	Watana Creek TRM 0.1	9/18/13	4/30/14	224	30			2	3.9	3.9	198.7 ↔ 202.6				2	74.0	1.4		10.0	0.0		18.3	0.0		100%
9173	Arctic Grayling	Upper River	Watana Creek TRM 0.1	9/18/13	1/6/15	475	21			2	3.2	3.2	195 ↔ 198.2				1	74.0	0.7	1	10.0	1.4		18.3	0.0		100%
9174	Arctic Grayling	Upper River	Watana Creek TRM 0.1	9/18/13	4/30/14	224	26			2	0.1	0.1	198.6 ↔ 198.7				2	74.0	1.4		10.0	0.0		18.3	0.0		100%
9175	Arctic Grayling	Upper River	Watana Creek TRM 0.1	9/18/13	6/2/14	257	14			2	18.8	18.8	202.6 ↔ 221.4				2	74.0	1.4		10.0	0.0		18.3	0.0		100%
9176	Arctic Grayling	Upper River	Watana Creek TRM 0.1	9/18/13	10/22/13	34																					
9177	Arctic Grayling	Upper River	Watana Creek TRM 0.1	9/18/13	11/12/13	55																					
9179	Arctic Grayling	Upper River	Watana Creek TRM 0.1	9/18/13	12/18/13	91																					
9181	Arctic Grayling	Upper River	Watana Creek TRM 0.1	9/18/13	10/7/13	19																					
9182	Arctic Grayling	Upper River	Watana Creek TRM 0.1	9/18/13	1/6/14	110																					
9184	Arctic Grayling	Upper River	Watana Creek TRM 0.1	9/18/13	6/16/14	271	29			2	0.9	0.9	199 ↔ 199.9				2	74.0	1.4		10.0	0.0		18.3	0.0		100%
9185	Arctic Grayling	Upper River	Susitna River PRM 187.7	9/19/13	11/13/13	55																					
9186	Arctic Grayling	Upper River	Susitna River PRM 208.3	9/19/13	11/11/13	53																					
9187	Arctic Grayling	Upper River	Susitna River PRM 208.3	9/19/13	6/4/15	623	41			4	44.7	44.7	209.9 ↔ 247.3		Tyone River	0 ↔ 7.3	3	82.9	1.2		10.1	0.0	1	44.4	0.8		50%
9188	Arctic Grayling	Upper River	Susitna River PRM 208.3	9/19/13	3/18/14	180																					
9189	Arctic Grayling	Upper River	Susitna River PRM 206.7	9/19/13	6/11/14	265	14			1					Tyone River	4.7 ↔ 4.7		74.0	0.0		10.1	0.0	1	17.8	5.7		0%
9194	Arctic Grayling	Upper River	Susitna River PRM 206.7	9/19/13	12/3/13	75																					
9210	Arctic Grayling	Upper River	Susitna River PRM 211	9/22/13	7/10/14	291	14048	1	1	2	22.6	14.6	202.6 ↔ 217.2				2	74.0	1.4		10.0	0.0		18.3	0.0		100%
9211	Arctic Grayling	Upper River	Susitna River PRM 211	9/22/13	10/21/13	29																					
9212	Arctic Grayling	Upper River	Goose Creek TRM 0.1	9/22/13	9/23/14	366	31			2	6.4	6.4	204.7 ↔ 211.1				1	74.0	0.7	1	10.0	1.4		18.3	0.0		100%
9214	Arctic Grayling	Upper River	Goose Creek TRM 0.1	9/22/13	7/5/14	286																					
9215	Arctic Grayling	Upper River	Goose Creek TRM 0.1	9/22/13	11/11/13	50																					
9216	Arctic Grayling	Upper River	Goose Creek TRM 0.1	9/22/13	11/11/13	50																					
9217	Arctic Grayling	Upper River	Goose Creek TRM 0.1	9/22/13	6/23/15	639	35			4	38.5	35.5	191.9 ↔ 227.4				4	82.9	1.7		10.1	0.0		44.4	0.0		100%
9225	Arctic Grayling	Upper River	Susitna River PRM 196.4	9/23/13	8/3/14	313	32			2	2.5	2.5	196.6 ↔ 199.1				1	74.0	0.7	1	10.0	1.4		18.3	0.0		100%
9226	Arctic Grayling	Upper River	Susitna River PRM 196.4	9/23/13	9/23/13	0																					

Table A-6. Tag summary for individual fish during the spawning season (Page 3 of 9).

				Spawning Season																							
Tag ID	Species	Tagging Segment	Release Location	Release Date	Last Live Date	Days Active	Total Detections	Fixed Station Events	# Fixed Stations Detected	# Aerial Surveys Detected	Distance Traveled (RM)	Linear Home Range (mi)	Mainstem Range (PRM)	Movments Past Dam Site	Tributaries & Lakes	Tributary Range (TRM)	Mainstem Aerial Detections	Mainstem Survey Length (mi)	Mainstem Selection Ratio	Confluence Aerial Detections	Ave Confluence Survey Length (mi)	Confluence Selection Ratio	Tributary Aerial Detections	Ave Tributary Survey Length (mi)	Tributary Selection Ratio	Lake Aerial Detections	% Aerial Detections in ZHI
9300	Arctic Grayling	Upper River	Susitna River PRM 203.5	6/2/14	7/10/14	38																					
9301	Arctic Grayling	Upper River	Susitna River PRM 203.5	6/2/14	6/23/15	386	25			2	1.7	1.7	222.3 ↔ 224				2	91.9	1.9		10.3	0.0		70.6	0.0		100%
9303	Arctic Grayling	Upper River	Susitna River PRM 203.5	6/2/14	6/23/15	386	15			2	18.1	18.1	219.1 ↔ 237.2				2	91.9	1.9		10.3	0.0		70.6	0.0		50%
9305	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/2/14	6/23/15	386	25			2	43.4	43.4	202.7 ↔ 246.1				2	91.9	1.9		10.3	0.0		70.6	0.0		50%
9306	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/2/14	2/3/15	246																					
9311	Arctic Grayling	Upper River	Susitna River PRM 194.8	6/3/14	6/23/15	385	13			2	10.3	10.3	177.2 ↔ 187.5	1 ↑			2	91.9	1.9		10.3	0.0		70.6	0.0		100%
9312	Arctic Grayling	Upper River	Susitna River PRM 194.8	6/3/14	11/24/14	174																					
9313	Arctic Grayling	Upper River	Susitna River PRM 227.1	6/4/14	9/17/14	105																					
9314	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/4/14	10/2/14	120																					
9315	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/4/14	6/28/14	24																					
9317	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/4/14	12/4/14	183																					
9318	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/4/14	10/2/14	120																					
9319	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/4/14	8/21/14	78																					
9320	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/4/14	6/23/15	384	23			2	5.1	5.1	229.2 ↔ 234.3				2	91.9	1.9		10.3	0.0		70.6	0.0		50%
9322	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/4/14	10/14/14	132																					
9323	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/4/14	4/23/15	323	20			2	0.7	0.7	188.8 ↔ 189.5	1 ↑			1	91.9	0.9	1	10.3	4.0		70.6	0.0		100%
9324	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/4/14	12/16/14	195																					
9325	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/4/14	6/23/15	384	27			2	12	12	230.6 ↔ 242.6				2	91.9	1.9		10.3	0.0		70.6	0.0		50%
9326	Arctic Grayling	Upper River	Susitna River PRM 203.5	6/4/14	2/3/15	244																					
9327	Arctic Grayling	Upper River	Susitna River PRM 203.5	6/4/14	6/29/14	25																					
9333	Arctic Grayling	Upper River	Susitna River PRM 206.7	6/5/14	6/4/15	364	4			1			202.5 ↔ 202.5				1	90.9	1.9		10.1	0.0		67.4	0.0		100%
9334	Arctic Grayling	Upper River	Susitna River PRM 206.7	6/5/14	2/3/15	243																					
9335	Arctic Grayling	Upper River	Susitna River PRM 206.7	6/5/14	6/4/15	364	13			2	24.7	24.7	209.5 ↔ 234.2				2	91.9	1.9		10.3	0.0		70.6	0.0		50%
9337	Arctic Grayling	Upper River	Susitna River PRM 227.1	6/5/14	1/6/15	215																					
9349	Arctic Grayling	Upper River	Susitna River PRM 203.5	6/6/14	4/14/15	312	9			1			228.1 ↔ 228.1				1	90.9	1.9		10.1	0.0		67.4	0.0		100%
9355	Arctic Grayling	Upper River	Watana Creek TRM 0.1	6/7/14	7/10/14	33																					
9357	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/7/14	6/4/15	362	16			2	0.4	0.4	196.5 ↔ 196.9				1	91.9	0.9	1	10.3	4.0		70.6	0.0		100%
9358	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/7/14	9/30/14	115																					
9359	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/7/14	6/28/14	21																					
9360	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/7/14	7/17/14	40																					
9361	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/7/14	9/17/14	102																					
9362	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/7/14	6/23/15	381	25			2	0	0	209.1 ↔ 209.1					91.9	0.0	2	10.3	7.9		70.6	0.0		100%
9363	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/7/14	5/20/15	347	22			2	0.4	0.4	190.3 ↔ 190.7				2	91.9	1.9		10.3	0.0		70.6	0.0		100%
9364	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/7/14	8/11/14	65																					
9365	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/7/14	7/14/14	37																					
9366	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/7/14	7/25/14	48																					
9367	Arctic Grayling	Upper River	Kosina Creek TRM 0.1	6/7/14	6/23/15	381	24			2	5.6	5.6			Tyone River	6.1 ↔ 11.7		91.9	0.0		10.3	0.0	2	70.6	2.4		0%
9374	Arctic Grayling	Upper River	Susitna River PRM 196.4	6/7/14	8/3/14	57																					
9383	Arctic Grayling	Upper River	Watana Creek TRM 0.1	6/8/14	6/17/14	9																					
9386	Arctic Grayling	Upper River	Susitna River PRM 198.9	6/8/14	10/14/14	128																					
9391	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	7/4/14	25																					
9392	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	8/13/14	65																					
9393	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	6/28/14	19																					
9394	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	6/28/14	19																					
9395	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	10/20/14	132																					
9396	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	7/15/14	36																					
9397	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	8/22/14	74																					
9399	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	7/22/14	43																					
9400	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	10/2/14	115																					
9401	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	8/21/14	73																					

Table A-6. Tag summary for individual fish during the spawning season (Page 4 of 9).

				Spawning Season																							
Tag ID	Species	Tagging Segment	Release Location	Release Date	Last Live Date	Days Active	Total Detections	Fixed Station Events	# Fixed Stations Detected	# Aerial Surveys Detected	Distance Traveled (RM)	Linear Home Range (mi)	Mainstem Range (PRM)	Movments Past Dam Site	Tributaries & Lakes	Tributary Range (TRM)	Mainstem Aerial Detections	Mainstem Survey Length (mi)	Mainstem Selection Ratio	Confluence Aerial Detections	Ave Confluence Survey Length (mi)	Confluence Selection Ratio	Tributary Aerial Detections	Ave Tributary Survey Length (mi)	Tributary Selection Ratio	Lake Aerial Detections	% Aerial Detections in ZHI
9402	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	7/17/14	38																					
9403	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	6/4/15	360	11			2	0.1	0.1	183.3 ↔ 183.4				2	91.9	1.9		10.3	0.0		70.6	0.0		100%
9404	Arctic Grayling	Upper River	Susitna River PRM 189.5	6/9/14	8/6/14	58																					
9047	Burbot	Middle/Lower DS of DC	Susitna River PRM 107	6/21/13	10/24/13	125																					
9050	Burbot	Middle/Lower DS of DC	Susitna River PRM 107	6/21/13	3/19/14	271	19			2	1.8	1.8	115.5 ↔ 117.3				1	50.9	0.7	1	7.2	1.7		17.0	0.0		100%
9144	Burbot	Middle/Lower DS of DC	Susitna River PRM 124.2	8/8/13	8/12/13	4																					
9147	Burbot	Middle/Lower DS of DC	Susitna River PRM 33.9	8/16/13	9/13/13	28																					
9148	Burbot	Middle/Lower DS of DC	Susitna River PRM 33.9	8/16/13	9/20/13	35																					
9149	Burbot	Middle/Lower DS of DC	Susitna River PRM 33.8	8/16/13	8/30/13	14																					
9150	Burbot	Middle/Lower DS of DC	Fish Creek (Kroto) TRM 1.9	8/16/13	9/20/13	35																					
9245	Burbot	Middle/Lower DS of DC	Susitna River PRM 80.9	9/28/13	12/17/14	445	32			2	2.4	2.4	90.6 ↔ 93				2	35.8	1.9		6.8	0.0		25.4	0.0		100%
9246	Burbot	Middle/Lower DS of DC	Susitna River PRM 80.9	9/28/13	10/24/13	26																					
9561	Burbot	Middle/Lower US of DC	Susitna River PRM 186.8	9/8/14	12/16/14	99																					
9562	Burbot	Middle/Lower US of DC	Susitna River PRM 186.8	9/8/14	10/29/14	51																					
9563	Burbot	Middle/Lower US of DC	Susitna River PRM 183.8	9/8/14	6/23/15	288	12			2	3.5	3.5	177.5 ↔ 181				2	53.0	1.5		6.2	0.0		20.5	0.0		100%
9564	Burbot	Middle/Lower US of DC	Susitna River PRM 185.2	9/9/14	6/23/15	287	23			2	0.1	0.1	176.3 ↔ 176.4				2	53.0	1.5		6.2	0.0		20.5	0.0		100%
9565	Burbot	Middle/Lower US of DC	Susitna River PRM 186.8	9/9/14	4/23/15	226	11			2	0.1	0.1	185.6 ↔ 185.7				2	86.1	1.7		10.0	0.0		51.9	0.0		100%
9191	Burbot	Upper River	Susitna River PRM 206.7	9/19/13	9/23/13	4																					
9192	Burbot	Upper River	Susitna River PRM 206.7	9/19/13	4/9/14	202	20			2	0.1	0.1	207.1 ↔ 207.2				2	67.3	1.3		8.4	0.0		12.7	0.0		100%
9205	Burbot	Upper River	Watana Creek TRM 0.1	9/20/13	12/18/13	89																					
9206	Burbot	Upper River	Watana Creek TRM 0.1	9/21/13	6/24/14	276	133			2	0.2	0.2	195.4 ↔ 195.6				2	67.3	1.3		8.4	0.0		12.7	0.0		100%
9209	Burbot	Upper River	Susitna River PRM 215.2	9/21/13	5/20/14	241	82			3	0.4	0.4	213.2 ↔ 213.6				3	56.5	1.3		6.2	0.0		9.4	0.0		100%
9222	Burbot	Upper River	Watana Creek TRM 0.1	9/23/13	6/23/15	638	51			4	6.7	6.7	202.7 ↔ 209.4				2	76.7	0.8	2	9.2	2.3		32.3	0.0		100%
9224	Burbot	Upper River	Susitna River PRM 196.4	9/23/13	4/23/15	577	62			4	2.2	2.2	193.7 ↔ 195.9				4	76.7	1.5		9.2	0.0		32.3	0.0		100%
9304	Burbot	Upper River	Susitna River PRM 203.5	6/2/14	7/10/14	38																					
9309	Burbot	Upper River	Watana Creek TRM 0.1	6/3/14	5/20/15	351	18			2	3.7	3.7	194 ↔ 197.7				1	86.1	0.9	1	10.0	3.2		51.9	0.0		100%
9310	Burbot	Upper River	Watana Creek TRM 0.1	6/3/14	6/28/14	25																					
9329	Burbot	Upper River	Watana Creek TRM 0.1	6/5/14	9/5/14	92																					
9330	Burbot	Upper River	Watana Creek TRM 0.1	6/5/14	11/5/14	153																					
9331	Burbot	Upper River	Susitna River PRM 203.5	6/5/14	9/5/14	92																					
9332	Burbot	Upper River	Susitna River PRM 203.5	6/5/14	10/14/14	131																					
9336	Burbot	Upper River	Susitna River PRM 206.7	6/5/14	10/2/14	119																					
9343	Burbot	Upper River	Watana Creek TRM 0.1	6/6/14	6/23/15	382	36			2	0		200.5 ↔ 200.5				2	86.1	1.7		10.0	0.0		51.9	0.0		100%
9351	Burbot	Upper River	Susitna River PRM 203.5	6/6/14	4/14/15	312	28			2	0.8	0.8	204.5 ↔ 205.3				1	86.1	0.9	1	10.0	3.2		51.9	0.0		100%
9352	Burbot	Upper River	Susitna River PRM 203.5	6/6/14	6/23/15	382	30			2	0.4	0.4	202.9 ↔ 203.3				1	86.1	0.9	1	10.0	3.2		51.9	0.0		100%
9373	Burbot	Upper River	Susitna River PRM 196.4	6/7/14	6/23/15	381	42			2	0		197.6 ↔ 197.6					86.1	0.0	2	10.0	6.2		51.9	0.0		100%
9378	Burbot	Upper River	Susitna River PRM 211	6/8/14	2/19/15	256	13			2	1.8	1.8	204.4 ↔ 206.2					86.1	0.0	2	10.0	6.2		51.9	0.0		100%
9379	Burbot	Upper River	Susitna River PRM 211	6/8/14	8/30/14	84																					
9511	Burbot	Upper River	Susitna River PRM 247.3	9/3/14	11/4/14	62																					
9512	Burbot	Upper River	Susitna River PRM 247.3	9/3/14	6/23/15	293	30			2	0.1	0.1	247.1 ↔ 247.2					86.1	0.0	2	10.0	6.2		51.9	0.0		0%
9514	Burbot	Upper River	Susitna River PRM 247.3	9/3/14	6/23/15	293	18			2	0		246.5 ↔ 246.5				2	86.1	1.7		10.0	0.0		51.9	0.0		0%
9515	Burbot	Upper River	Susitna River PRM 247.3	9/3/14	9/17/14	14																					
9516	Burbot	Upper River	Susitna River PRM 247.3	9/3/14	9/3/14	0																					
9517	Burbot	Upper River	Susitna River PRM 232.4	9/3/14	6/23/15	293	38			2	0.3	0.3	234.4 ↔ 234.7				2	86.1	1.7		10.0	0.0		51.9	0.0		0%
9518	Burbot	Upper River	Susitna River PRM 232.4	9/3/14	3/25/15	203	32			2	1.9	1.9	233 ↔ 234.9					86.1	0.0	2	10.0	6.2		51.9	0.0		0%
9519	Burbot	Upper River	Susitna River PRM 211.1	9/4/14	6/23/15	292	32			2	1.4	1.4	210 ↔ 211.4				2	86.1	1.7		10.0	0.0		51.9	0.0		100%
9520	Burbot	Upper River	Susitna River PRM 210.3	9/4/14	6/23/15	292	53			2	0.1	0.1	199.8 ↔ 199.9				2	86.1	1.7		10.0	0.0		51.9	0.0		100%
9521	Burbot	Upper River	Susitna River PRM 210.3	9/4/14	10/2/14	28																					
9522	Burbot	Upper River	Susitna River PRM 210.3	9/4/14	11/4/14	61																					
9523	Burbot	Upper River	Susitna River PRM 210.3	9/4/14	4/23/15	231	22			2	0.1	0.1	210.3 ↔ 210.4				2	86.1	1.7		10.0	0.0		51.9	0.0		100%

Table A-6. Tag summary for individual fish during the spawning season (Page 5 of 9).

				Spawning Season																							
Tag ID	Species	Tagging Segment	Release Location	Release Date	Last Live Date	Days Active	Total Detections	Fixed Station Events	# Fixed Stations Detected	# Aerial Surveys Detected	Distance Traveled (RM)	Linear Home Range (mi)	Mainstem Range (PRM)	Movments Past Dam Site	Tributaries & Lakes	Tributary Range (TRM)	Mainstem Aerial Detections	Mainstem Survey Length (mi)	Mainstem Selection Ratio	Confluence Aerial Detections	Ave Confluence Survey Length (mi)	Confluence Selection Ratio	Tributary Aerial Detections	Ave Tributary Survey Length (mi)	Tributary Selection Ratio	Lake Aerial Detections	% Aerial Detections in ZHI
9539	Burbot	Upper River	Watana Creek TRM 0.1	9/6/14	6/23/15	290	29			2	0.4	0.4	196.8 ↔ 197.2				1	86.1	0.9	1	10.0	3.2		51.9	0.0		100%
9541	Burbot	Upper River	Susitna River PRM 192.7	9/6/14	6/23/15	290	9			2	0		190.3 ↔ 190.3				2	86.1	1.7		10.0	0.0		51.9	0.0		100%
9546	Burbot	Upper River	Susitna River PRM 192.7	9/7/14	6/23/15	289	15			2	0.2	0.2	191.1 ↔ 191.3				2	86.1	1.7		10.0	0.0		51.9	0.0		100%
9547	Burbot	Upper River	Susitna River PRM 194.3	9/7/14	9/27/14	20																					
9548	Burbot	Upper River	Watana Creek TRM 0.1	9/7/14	5/20/15	255	14			2	0.7	0.7	195.2 ↔ 195.9				2	86.1	1.7		10.0	0.0		51.9	0.0		100%
9549	Burbot	Upper River	Watana Creek TRM 0.1	9/7/14	10/2/14	25																					
9554	Burbot	Upper River	Susitna River PRM 198.9	9/7/14	6/23/15	289	32			2	0		198.9 ↔ 198.9				2	86.1	1.7		10.0	0.0		51.9	0.0		100%
9031	Dolly Varden	Middle/Lower DS of DC	Susitna River PRM 124.2	6/17/13	11/15/13	151																					
9060	Dolly Varden	Middle/Lower DS of DC	Talkeetna River TRM 6.3	7/14/13	7/15/13	1																					
9064	Dolly Varden	Middle/Lower DS of DC	Talkeetna River TRM 6.3	7/14/13	7/19/14	370	4			1					Talkeetna River	5.9 ↔ 5.9		66.5	0.0		10.0	0.0	1	21.5	4.6		0%
9065	Dolly Varden	Middle/Lower DS of DC	Talkeetna River TRM 6.3	7/14/13	7/24/13	10																					
9066	Dolly Varden	Middle/Lower DS of DC	Talkeetna River TRM 5.9	7/14/13	7/24/13	10																					
9067	Dolly Varden	Middle/Lower DS of DC	Talkeetna River TRM 5.9	7/14/13	9/20/13	68	3			1			80.9 ↔ 80.9					78.3	0.0	1	10.4	1.9		9.4	0.0		0%
9072	Dolly Varden	Middle/Lower DS of DC	Talkeetna River TRM 5.9	7/14/13	6/4/14	325																					
9145	Dolly Varden	Middle/Lower DS of DC	Susitna River PRM 124.2	8/8/13	8/15/13	6																					
9157	Dolly Varden	Middle/Lower DS of DC	Susitna River PRM 142	8/18/13	9/1/13	14																					
9005	Humpback Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/13/13	6/13/13	0																					
9042	Humpback Whitefish	Middle/Lower DS of DC	Susitna River PRM 107	6/21/13	6/28/13	7																					
9048	Humpback Whitefish	Middle/Lower DS of DC	Susitna River PRM 107	6/21/13	7/10/13	19																					
9112	Humpback Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	7/21/13	8/31/13	41																					
9116	Humpback Whitefish	Middle/Lower DS of DC	Susitna River PRM 152.3	7/23/13	8/5/13	13																					
9117	Humpback Whitefish	Middle/Lower DS of DC	Susitna River PRM 152.3	7/23/13	8/9/13	17																					
9138	Humpback Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	7/24/13	8/12/13	18																					
9530	Lake Trout	Upper River	Tsisi Lake 1	9/5/14	5/20/15	257	18			2	0.2				Tsisi Lake 1			73.1	0.0		10.1	0.0		54.8	0.0	2	0%
9531	Lake Trout	Upper River	Tsisi Lake 1	9/5/14	6/4/15	272	3			1					Tsisi Lake 1			74.0	0.0		10.5	0.0		67.6	0.0	1	0%
9532	Lake Trout	Upper River	Tsisi Lake 1	9/5/14	6/4/15	272	5			2	0.1				Tsisi Lake 1			73.1	0.0		10.1	0.0		54.8	0.0	2	0%
9533	Lake Trout	Upper River	Tsisi Lake 1	9/5/14	6/4/15	272	7			2	0.6				Tsisi Lake 1			73.1	0.0		10.1	0.0		54.8	0.0	2	0%
9534	Lake Trout	Upper River	Tsisi Lake 1	9/5/14	6/4/15	272	8			2	0.1				Tsisi Lake 1			73.1	0.0		10.1	0.0		54.8	0.0	2	0%
9535	Lake Trout	Upper River	Tsisi Lake 1	9/5/14	6/4/15	272	9			2	0.5				Tsisi Lake 1			73.1	0.0		10.1	0.0		54.8	0.0	2	0%
9536	Lake Trout	Upper River	Tsisi Lake 1	9/5/14	6/4/15	272	5			2	0.4				Tsisi Lake 1			73.1	0.0		10.1	0.0		54.8	0.0	2	0%
9537	Lake Trout	Upper River	Tsisi Lake 1	9/5/14	6/4/15	272	11			2	0.1				Tsisi Lake 1			73.1	0.0		10.1	0.0		54.8	0.0	2	0%
9538	Lake Trout	Upper River	Tsisi Lake 1	9/5/14	6/4/15	272	10			2	0.2				Tsisi Lake 1			73.1	0.0		10.1	0.0		54.8	0.0	2	0%
9566	Lake Trout	Upper River	Sally Lake	9/9/14	6/4/15	268																					
9567	Lake Trout	Upper River	Tsisi Lake 1	9/9/14	6/4/15	268	13			2	0.2				Tsisi Lake 1			73.1	0.0		10.1	0.0		54.8	0.0	2	0%
9568	Lake Trout	Upper River	Tsisi Lake 1	9/9/14	11/4/14	56	4			1					Tsisi Lake 1			74.0	0.0		10.5	0.0		67.6	0.0	1	0%
9006	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 124.2	6/14/13	6/14/13	0																					
9028	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 124.2	6/17/13	8/27/14	436	26			2	0.4	0.4	118.7 ↔ 119.1				2	76.2	1.3		8.6	0.0		16.1	0.0		100%
9032	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 124.2	6/17/13	9/7/13	82																					
9035	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 124.2	6/18/13	7/3/13	15																					
9036	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 124.2	6/18/13	8/16/13	59																					
9037	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 107	6/20/13	9/21/13	93																					
9038	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 107	6/20/13	7/15/13	25																					
9039	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 107	6/20/13	6/24/13	4																					
9043	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 107	6/21/13	7/3/13	12																					
9044	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 107	6/21/13	6/28/13	7																					
9045	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 107	6/21/13	6/28/13	6																					
9046	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 107	6/21/13	7/25/13	34																					
9049	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 107	6/21/13	6/26/13	5																					
9068	Longnose Sucker	Middle/Lower DS of DC	Talkeetna River TRM 5.9	7/14/13	8/2/13	19																					
9070	Longnose Sucker	Middle/Lower DS of DC	Talkeetna River TRM 5.9	7/14/13	7/24/13	10																					

Table A-6. Tag summary for individual fish during the spawning season (Page 6 of 9).

				Spawning Season																							
Tag ID	Species	Tagging Segment	Release Location	Release Date	Last Live Date	Days Active	Total Detections	Fixed Station Events	# Fixed Stations Detected	# Aerial Surveys Detected	Distance Traveled (RM)	Linear Home Range (mi)	Mainstem Range (PRM)	Movments Past Dam Site	Tributaries & Lakes	Tributary Range (TRM)	Mainstem Aerial Detections	Mainstem Survey Length (mi)	Mainstem Selection Ratio	Confluence Aerial Detections	Ave Confluence Survey Length (mi)	Confluence Selection Ratio	Tributary Aerial Detections	Ave Tributary Survey Length (mi)	Tributary Selection Ratio	Lake Aerial Detections	% Aerial Detections in ZHI
9073	Longnose Sucker	Middle/Lower DS of DC	Talkeetna River TRM 5.9	7/14/13	7/25/13	11																					
9074	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 107	7/15/13	7/19/13	4																					
9118	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 152.3	7/23/13	8/1/13	9																					
9134	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 142.3	7/25/13	8/28/13	34																					
9135	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 142.3	7/25/13	8/1/13	7																					
9137	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 142.3	7/26/13	8/10/13	15																					
9156	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 142	8/18/13	8/30/13	12																					
9158	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 142	8/18/13	1/28/14	163																					
9160	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 117.5	8/18/13	4/8/14	233																					
9161	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 113.8	8/19/13	12/18/13	121																					
9162	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 113.8	8/19/13	8/30/13	11																					
9165	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 142.3	8/29/13	9/4/13	6																					
9167	Longnose Sucker	Middle/Lower DS of DC	Susitna River PRM 142	9/18/13	12/3/13	76																					
9119	Longnose Sucker	Upper River	Tyone River TRM 0.4	7/23/13	7/23/13	0																					
9120	Longnose Sucker	Upper River	Tyone River TRM 0.4	7/23/13	7/23/13	0																					
9121	Longnose Sucker	Upper River	Tyone River TRM 0.4	7/23/13	7/27/13	4																					
9122	Longnose Sucker	Upper River	Tyone River TRM 0.4	7/23/13	8/9/13	17																					
9123	Longnose Sucker	Upper River	Tyone River TRM 0.4	7/23/13	8/20/13	28																					
9190	Longnose Sucker	Upper River	Susitna River PRM 206.7	9/19/13	9/30/13	11																					
9195	Longnose Sucker	Upper River	Susitna River PRM 206.7	9/19/13	2/19/15	518	227	1	1	2	4	4	205.2 ↔ 209.2				2	74.0	2.0		10.4	0.0		63.1	0.0		100%
9197	Longnose Sucker	Upper River	Susitna River PRM 206.7	9/19/13	11/12/13	54																					
9199	Longnose Sucker	Upper River	Susitna River PRM 206.7	9/19/13	11/4/14	411	2116	1	1	2	2	1.8	209.2 ↔ 211				1	74.0	1.0	1	10.4	3.6		63.1	0.0		100%
9200	Longnose Sucker	Upper River	Susitna River PRM 198.1	9/20/13	7/17/14	300	8			1			192.2 ↔ 192.2				1	74.0	2.1		10.5	0.0		72.5	0.0		100%
9339	Longnose Sucker	Upper River	Watana Creek TRM 0.1	6/6/14	6/17/14	11	503	4	4	1	66.8	66.8	130.2 ↔ 196.9	1 ↓	Watana Creek	0 ↔ 0.1	1	74.0	1.9		10.3	0.0		53.6	0.0		100%
9340	Longnose Sucker	Upper River	Watana Creek TRM 0.1	6/6/14	8/7/14	62	626	1	1		0.2	0.1	196.9 ↔ 196.9		Watana Creek	0 ↔ 0.1											
9341	Longnose Sucker	Upper River	Watana Creek TRM 0.1	6/6/14	7/15/14	39	42	1	1	1	0.2	0.2	196.9 ↔ 197		Watana Creek	0 ↔ 0.1		74.0	0.0	1	10.3	6.2		53.6	0.0		100%
9342	Longnose Sucker	Upper River	Watana Creek TRM 0.1	6/6/14	7/9/14	33	1287	1	1	1	0.4	0.2	196.9 ↔ 197		Watana Creek	0 ↔ 0.1		74.0	0.0	1	10.3	6.2		53.6	0.0		100%
9347	Longnose Sucker	Upper River	Watana Creek TRM 0.1	6/6/14	8/5/14	60	8101	1	1		0.2	0.1	196.9 ↔ 196.9		Watana Creek	0 ↔ 0.1											
9348	Longnose Sucker	Upper River	Watana Creek TRM 0.1	6/6/14	8/7/14	62	1								Watana Creek	0.1 ↔ 0.1											
9354	Longnose Sucker	Upper River	Susitna River PRM 203.5	6/6/14	12/16/14	193	20			1	2.4	2.4	201.1 ↔ 203.5				1	74.0	1.9		10.3	0.0		53.6	0.0		100%
9356	Longnose Sucker	Upper River	Susitna River PRM 203.5	6/7/14	8/18/14	72	8			1	0.6	0.6	203.5 ↔ 204.1					74.0	0.0	1	10.3	6.2		53.6	0.0		100%
9368	Longnose Sucker	Upper River	Susitna River PRM 206.7	6/7/14	11/12/14	158	7			1	4.7	4.7	202 ↔ 206.7				1	74.0	1.9		10.3	0.0		53.6	0.0		100%
9370	Longnose Sucker	Upper River	Susitna River PRM 206.7	6/7/14	11/4/14	150	1						206.7 ↔ 206.7														
9371	Longnose Sucker	Upper River	Susitna River PRM 206.7	6/7/14	10/2/14	117	3			1	0.9	0.9	205.8 ↔ 206.7				1	74.0	1.9		10.3	0.0		53.6	0.0		100%
9372	Longnose Sucker	Upper River	Susitna River PRM 206.7	6/7/14	11/4/14	150	7			1	0.3	0.3	206.7 ↔ 207				1	74.0	1.9		10.3	0.0		53.6	0.0		100%
9375	Longnose Sucker	Upper River	Susitna River PRM 196.4	6/7/14	10/14/14	129	1						196.4 ↔ 196.4														
9376	Longnose Sucker	Upper River	Susitna River PRM 196.4	6/7/14	10/2/14	117	134	1	1	1	1	0.8	196.2 ↔ 197				1	74.0	1.9		10.3	0.0		53.6	0.0		100%
9377	Longnose Sucker	Upper River	Susitna River PRM 196.4	6/7/14	12/3/14	179	622	1	1	1	1.4	1	196 ↔ 197				1	74.0	1.9		10.3	0.0		53.6	0.0		100%
9384	Longnose Sucker	Upper River	Watana Creek TRM 0.1	6/8/14	6/4/15	361	628	1	1	2	0.7	1.4	196.9 ↔ 198.2		Watana Creek	0 ↔ 0.1	1	86.1	0.8	1	9.2	2.7		39.4	0.0		100%
9388	Longnose Sucker	Upper River	Susitna River PRM 198.9	6/8/14	10/2/14	116	30			1	0.1	0.1	198.9 ↔ 199				1	74.0	1.9		10.3	0.0		53.6	0.0		100%
9500	Longnose Sucker	Upper River	Susitna River PRM 247.3	9/2/14	12/16/14	105																					
9501	Longnose Sucker	Upper River	Susitna River PRM 247.3	9/2/14	6/23/15	294	53			2	12.9	12.9	235.2 ↔ 247.3		Tyone River	0 ↔ 0.8		86.1	0.0	1	9.2	2.7	1	39.4	1.7		0%
9502	Longnose Sucker	Upper River	Susitna River PRM 247.3	9/2/14	9/2/14	0																					
9503	Longnose Sucker	Upper River	Susitna River PRM 247.3	9/2/14	12/3/14	92																					
9504	Longnose Sucker	Upper River	Susitna River PRM 247.3	9/2/14	9/2/14	0																					
9507	Longnose Sucker	Upper River	Susitna River PRM 247	9/2/14	6/23/15	294	39			2	3.4	3.9			Oshetna River	0.5 ↔ 3.9		86.1	0.0		9.2	0.0	2	39.4	3.4		0%
9508	Longnose Sucker	Upper River	Susitna River PRM 247	9/2/14	9/10/14	7																					
9509	Longnose Sucker	Upper River	Susitna River PRM 247	9/2/14	9/17/14	15																					
9510	Longnose Sucker	Upper River	Susitna River PRM 247	9/2/14	11/4/14	63																					
9513	Longnose Sucker	Upper River	Susitna River PRM 247.3	9/3/14	9/3/14	0																					

Table A-6. Tag summary for individual fish during the spawning season (Page 7 of 9).

				Spawning Season																							
Tag ID	Species	Tagging Segment	Release Location	Release Date	Last Live Date	Days Active	Total Detections	Fixed Station Events	# Fixed Stations Detected	# Aerial Surveys Detected	Distance Traveled (RM)	Linear Home Range (mi)	Mainstem Range (PRM)	Movments Past Dam Site	Tributaries & Lakes	Tributary Range (TRM)	Mainstem Aerial Detections	Mainstem Survey Length (mi)	Mainstem Selection Ratio	Confluence Aerial Detections	Ave Confluence Survey Length (mi)	Confluence Selection Ratio	Tributary Aerial Detections	Ave Tributary Survey Length (mi)	Tributary Selection Ratio	Lake Aerial Detections	% Aerial Detections in ZHI
9525	Longnose Sucker	Upper River	Susitna River PRM 213.6	9/4/14	11/4/14	61																					
9540	Longnose Sucker	Upper River	Watana Creek TRM 0.1	9/6/14	11/5/14	60																					
9542	Longnose Sucker	Upper River	Susitna River PRM 192.7	9/6/14	10/14/14	38																					
9550	Longnose Sucker	Upper River	Susitna River PRM 198.9	9/7/14	9/22/14	15																					
9555	Longnose Sucker	Upper River	Susitna River PRM 198.9	9/7/14	6/23/15	289	11			1			195.3 ↔ 195.3				1	92.8	2.0		10.8	0.0		78.7	0.0		100%
9558	Longnose Sucker	Upper River	Susitna River PRM 198.9	9/7/14	6/23/15	289	18			1			199.4 ↔ 199.4				1	92.8	2.0		10.8	0.0		78.7	0.0		100%
9559	Longnose Sucker	Upper River	Susitna River PRM 198.9	9/7/14	9/17/14	10																					
9151	Northern Pike	Middle/Lower DS of DC	Fish Creek (Kroto) TRM 3.3	8/16/13	10/29/14	439	14			1					Fish Creek (Kroto)	3.6 ↔ 3.6		62.9	0.0		8.4	0.0	1	26.1	3.7		0%
9152	Northern Pike	Middle/Lower DS of DC	Fish Creek (Kroto) TRM 3.3	8/16/13	5/14/14	271																					
9153	Northern Pike	Middle/Lower DS of DC	Fish Creek (Kroto) TRM 3.3	8/16/13	1/7/14	144																					
9154	Northern Pike	Middle/Lower DS of DC	Fish Creek (Kroto) TRM 3.3	8/16/13	8/16/13	0																					
9155	Northern Pike	Middle/Lower DS of DC	Fish Creek (Kroto) TRM 3.3	8/16/13	4/8/14	235																					
9008	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 124.2	6/14/13	9/2/14	445	3935	5	4	4	61.1	41.4	106.3 ↔ 142.1		Indian River	0 ↔ 5.6	1	44.3	0.4		6.3	0.0	3	20.5	2.6		25%
9017	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 134.3	6/16/13	8/12/13	57	11457	3	1	3	1.5	0.6	134.3 ↔ 134.3		Fourth of July Creek	0 ↔ 0.6		64.2	0.0	1	8.0	0.8	2	10.1	5.5		33%
9018	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 134.3	6/16/13	4/30/14	318	6844	2	1	3	1.6	0.5	134.3 ↔ 134.8				2	58.7	0.9	1	7.3	1.0		14.2	0.0		100%
9019	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 134.3	6/16/13	9/3/13	79	6454	2	1	2	0.5	0.5	134.3 ↔ 134.3		Fourth of July Creek	0 ↔ 0.5		78.9	0.0	1	9.9	1.1	1	12.4	4.1		50%
9021	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 124.2	6/16/13	4/30/14	318	446	3	1	3	18.5	6.5	124.2 ↔ 130.7				3	60.0	1.3		7.3	0.0		12.1	0.0		100%
9022	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 124.2	6/16/13	9/3/13	79	1						124.2 ↔ 124.2														
9026	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 124.2	6/17/13	7/30/13	43	10			2	1.3	1	123.9 ↔ 124.9				2	41.2	1.5		5.0	0.0		14.8	0.0		100%
9040	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 124.2	6/20/13	4/8/14	292	1						124.2 ↔ 124.2														
9041	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 124.2	6/21/13	8/25/13	65	7			2	0.1	0.1	124.2 ↔ 124.3				2	72.6	1.3		9.0	0.0		9.2	0.0		100%
9051	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 124.2	6/24/13	5/21/14	331	28			2	1	8.7	123.2 ↔ 124.2		Chulitna River	7.7 ↔ 7.7*	1	72.8	0.7		9.8	0.0	1	17.1	2.9		50%
9052	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 124.2	6/25/13	7/24/13	29	2			1	0.3	0.3	124.2 ↔ 124.5				1	34.9	1.6		3.9	0.0		17.8	0.0		100%
9054	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 134.3	7/9/13	9/21/14	439	44			4	1.3	1.2			Fourth of July Creek	0.1 ↔ 1.2		47.5	0.0	1	7.0	1.0	3	21.1	2.7		0%
9055	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 134.3	7/9/13	9/8/13	61																					
9056	Rainbow Trout	Middle/Lower DS of DC	Talkeetna River TRM 6.3	7/14/13	9/30/14	443	8			1		2.9			Talkeetna River	2.9 ↔ 2.9		35.3	0.0		5.9	0.0	1	21.1	3.0		0%
9057	Rainbow Trout	Middle/Lower DS of DC	Talkeetna River TRM 6.3	7/14/13	8/23/13	40																					
9058	Rainbow Trout	Middle/Lower DS of DC	Talkeetna River TRM 6.3	7/14/13	8/2/13	19																					
9059	Rainbow Trout	Middle/Lower DS of DC	Talkeetna River TRM 6.3	7/14/13	8/9/13	26																					
9061	Rainbow Trout	Middle/Lower DS of DC	Talkeetna River TRM 6.3	7/14/13	8/19/14	401	32			6	14.7	11.2	97.2 ↔ 102.2		Chulitna River	0 ↔ 6.2	4	85.3	0.9	1	9.3	0.5	1	18.5	1.0		83%
9062	Rainbow Trout	Middle/Lower DS of DC	Talkeetna River TRM 6.3	7/14/13	8/2/13	19																					
9063	Rainbow Trout	Middle/Lower DS of DC	Talkeetna River TRM 6.3	7/14/13	8/30/13	47																					
9071	Rainbow Trout	Middle/Lower DS of DC	Talkeetna River TRM 5.9	7/14/13	7/24/13	10																					
9075	Rainbow Trout	Middle/Lower DS of DC	Montana Creek TRM 2.3	7/15/13	8/23/13	39																					
9076	Rainbow Trout	Middle/Lower DS of DC	Montana Creek TRM 2.3	7/15/13	8/1/13	17																					
9077	Rainbow Trout	Middle/Lower DS of DC	Montana Creek TRM 2.3	7/15/13	8/9/13	25																					
9078	Rainbow Trout	Middle/Lower DS of DC	Montana Creek TRM 2.3	7/15/13	8/9/13	25																					
9079	Rainbow Trout	Middle/Lower DS of DC	Montana Creek TRM 2.3	7/15/13	2/4/15	569	320	1	1	4	5.4	4	80.5 ↔ 83.5		Montana Creek	0 ↔ 1	2	74.3	0.7	2	7.8	1.7		18.2	0.0		25%
9080	Rainbow Trout	Middle/Lower DS of DC	Montana Creek TRM 2.3	7/15/13	8/17/13	33																					
9133	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 142	7/25/13	8/31/13	37																					
9146	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 124.2	8/16/13	8/29/13	13																					
9159	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 142	8/18/13	8/31/13	13																					
9166	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 142.3	8/29/13	11/3/13	66																					
9168	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 142	9/18/13	9/24/13	6																					
9169	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 142	9/18/13	9/24/13	6																					
9228	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 134.3	9/25/13	7/14/14	292	51			5	5	2.5	131.8 ↔ 134.3				1	42.4	0.3	4	6.4	3.0		17.4	0.0		100%
9237	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 142	9/25/13	4/23/15	575	14953	1	1	5	8.2	7.6	135.1 ↔ 142.1		Indian River	0 ↔ 0.6	1	42.4	0.3		6.4	0.0	4	17.4	3.0		20%
9238	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 142	9/25/13	6/3/15	616	89			5	1.5	94.7	40.9 ↔ 134.6		Fourth of July Creek	0 ↔ 1	2	57.6	0.7	1	8.6	1.2	2	41.0	1.0		40%
9239	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 142	9/25/13	7/6/15	649	3101	1	1	3	8.9	8.9	139.4 ↔ 142.1		Indian River	0 ↔ 6.2	1	60.3	0.7		9.2	0.0	2	54.0	1.5		33%
9242	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 80.9	9/27/13	2/4/15	495	88			6	11.6	9.6	79.2 ↔ 88.8				4	88.6	0.9	2	8.9	1.0		15.9	0.0		50%

Table A-6. Tag summary for individual fish during the spawning season (Page 8 of 9).

				Spawning Season																								
Tag ID	Species	Tagging Segment	Release Location	Release Date	Last Live Date	Days Active	Total Detections	Fixed Station Events	# Fixed Stations Detected	# Aerial Surveys Detected	Distance Traveled (RM)	Linear Home Range (mi)	Mainstem Range (PRM)	Movments Past Dam Site	Tributaries & Lakes	Tributary Range (TRM)	Mainstem Aerial Detections	Mainstem Survey Length (mi)	Mainstem Selection Ratio	Confluence Aerial Detections	Ave Confluence Survey Length (mi)	Confluence Selection Ratio	Tributary Aerial Detections	Ave Tributary Survey Length (mi)	Tributary Selection Ratio	Lake Aerial Detections	% Aerial Detections in ZHI
9243	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 80.9	9/27/13	7/6/15	647	59			6	8	9.7			Montana Creek	0.3 ↔ 9.7		89.9	0.0		9.7	0.0	6	35.7	3.8		17%
9244	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 80.9	9/28/13	8/19/14	325	2			1			76.6 ↔ 76.6				1	79.5	1.2		6.5	0.0		10.7	0.0		0%
9247	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 80.9	9/28/13	10/29/14	396	15			1			76.4 ↔ 76.4					62.9	0.0	1	8.4	4.1		26.1	0.0		0%
9248	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 80.9	9/28/13	8/22/14	328	13			1			71.6 ↔ 71.6				1	62.9	1.5		8.4	0.0		26.1	0.0		0%
9249	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 80.9	9/28/13	12/17/14	445	61			5	5.7	3.6	80.9 ↔ 82.6		Montana Creek	0 ↔ 1.9	1	82.8	0.3		8.4	0.0	4	16.8	5.1		20%
9250	Rainbow Trout	Middle/Lower DS of DC	Susitna River PRM 80.9	9/28/13	8/28/14	334	14			1			84.5 ↔ 84.5				1	62.9	1.5		8.4	0.0		26.1	0.0		100%
9009	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/14/13	6/26/13	12																					
9011	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/14/13	5/24/14	343	4			1			124.1 ↔ 124.1				1	34.9	2.4		4.5	0.0		43.6	0.0		100%
9012	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/14/13	9/20/13	98																					
9013	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/15/13	12/3/13	171	8			3	2.9	2.4	130.4 ↔ 132.8				3	49.6	2.0		7.1	0.0		41.3	0.0		100%
9023	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/16/13	9/8/13	84																					
9024	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/16/13	10/2/13	108	2			1			68 ↔ 68				1	75.4	1.4		10.2	0.0		22.8	0.0		0%
9025	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/16/13	2/18/14	247	347	1	1	2	5.5	5.5	136.7 ↔ 142.1		Indian River	0 ↔ 0.1	1	57.0	0.9	1	8.5	2.9		40.2	0.0		100%
9027	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/17/13	9/13/13	88																					
9030	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/17/13	10/9/13	114	22			2	0.3	0.3	98.8 ↔ 99.1				2	71.0	1.5		10.1	0.0		22.2	0.0		100%
9033	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/18/13	9/3/13	77																					
9034	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	6/18/13	9/20/13	94																					
9053	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 124.2	7/7/13	8/17/14	406	2			1			61 ↔ 61				1	79.5	1.2		6.5	0.0		7.7	0.0		0%
9069	Round Whitefish	Middle/Lower DS of DC	Talkeetna River TRM 5.9	7/14/13	8/16/13	33																					
9136	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 142.3	7/26/13	7/31/13	5																					
9229	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 134.3	9/25/13	4/8/14	195	127	1	1	2	7.9	7.9	134.2 ↔ 142.1				1	57.0	0.9	1	8.5	2.9		40.2	0.0		100%
9230	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 134.3	9/25/13	2/19/14	147	5			1			134.7 ↔ 134.7				1	66.5	1.5		10.0	0.0		21.5	0.0		100%
9231	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 134.3	9/25/13	5/30/14	247	7			1			134 ↔ 134					66.5	0.0	1	10.0	3.2		21.5	0.0		100%
9232	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 134.3	9/25/13	7/2/14	280	92	1	1	3	21.4	21.4	101.4 ↔ 122.8				3	64.5	1.6		7.8	0.0		29.3	0.0		100%
9233	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 134.3	9/25/13	4/30/14	217	43	1	1	2	7.8	7.8	134.3 ↔ 142.1				1	57.0	0.9	1	8.5	2.9		40.2	0.0		100%
9234	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 134.3	9/25/13	12/16/13	82	10			3	1.9	1.5	132.9 ↔ 134.3		Fourth of July Creek	0 ↔ 0.1	1	49.6	0.7	2	7.1	4.6		41.3	0.0		67%
9235	Round Whitefish	Middle/Lower DS of DC	Susitna River PRM 142	9/25/13	4/23/15	575	364	3	1	7	9	4	138.9 ↔ 142.9				4	41.6	1.2	3	5.9	3.2		37.7	0.0		100%
9178	Round Whitefish	Upper River	Watana Creek TRM 0.1	9/18/13	12/18/13	91	15			2	4.6	4.6	192.3 ↔ 196.9				1	39.3	0.8	1	6.7	1.9		17.8	0.0		100%
9180	Round Whitefish	Upper River	Watana Creek TRM 0.1	9/18/13	10/7/13	19	5			1			198.2 ↔ 198.2				1	62.3	1.6		9.6	0.0		27.1	0.0		100%
9183	Round Whitefish	Upper River	Watana Creek TRM 0.1	9/18/13	12/2/13	75	7455	1	1	1	10.3	10.3	198.9 ↔ 209.2				1	62.3	1.6		9.6	0.0		27.1	0.0		100%
9193	Round Whitefish	Upper River	Susitna River PRM 206.7	9/19/13	9/24/14	370	6			2	1.2	1.2	196.9 ↔ 198.1				1	39.3	0.8	1	6.7	1.9		17.8	0.0		100%
9196	Round Whitefish	Upper River	Susitna River PRM 206.7	9/19/13	10/26/13	36	19561	1	1	1	0		209.2 ↔ 209.2					62.3	0.0	1	9.6	3.8		27.1	0.0		100%
9198	Round Whitefish	Upper River	Susitna River PRM 206.7	9/19/13	6/4/15	623	7475	2	2	2	23.4	23.4	187.2 ↔ 210.6				2	39.3	1.6		6.7	0.0		17.8	0.0		100%
9201	Round Whitefish	Upper River	Susitna River PRM 198.1	9/20/13	4/30/14	222	7			2	1.9	1.9	195.8 ↔ 197.7				1	39.3	0.8	1	6.7	1.9		17.8	0.0		100%
9202	Round Whitefish	Upper River	Susitna River PRM 198.1	9/20/13	11/13/13	54	6			2	1.2	1.2	192.3 ↔ 193.5				2	39.3	1.6		6.7	0.0		17.8	0.0		100%
9203	Round Whitefish	Upper River	Susitna River PRM 203.5	9/20/13	3/25/15	551	602	2	1	1	2.2	1.1	209.2 ↔ 210.3				1	62.3	1.6		9.6	0.0		27.1	0.0		100%
9204	Round Whitefish	Upper River	Susitna River PRM 203.5	9/20/13	12/18/13	89	3			1			200.5 ↔ 200.5				1	62.3	1.6		9.6	0.0		27.1	0.0		100%
9207	Round Whitefish	Upper River	Susitna River PRM 201.4	9/21/13	1/6/14	107	6			2	7.8	7.8	197.2 ↔ 205				2	39.3	1.6		6.7	0.0		17.8	0.0		100%
9208	Round Whitefish	Upper River	Susitna River PRM 201.4	9/21/13	8/30/14	343	13			1			190 ↔ 190				1	62.3	1.6		9.6	0.0		27.1	0.0		100%
9213	Round Whitefish	Upper River	Goose Creek TRM 0.1	9/22/13	10/29/13	37	22	1	1				209.2 ↔ 209.2														
9218	Round Whitefish	Upper River	Susitna River PRM 206.7	9/23/13	11/13/13	51	8			2	11	11	194.7 ↔ 205.7				1	39.3	0.8	1	6.7	1.9		17.8	0.0		100%
9219	Round Whitefish	Upper River	Susitna River PRM 206.7	9/23/13	1/28/14	127	3			1			194.8 ↔ 194.8					62.3	0.0	1	9.6	3.8		27.1	0.0		100%
9220	Round Whitefish	Upper River	Susitna River PRM 206.7	9/23/13	1/6/14	105	3			1			205.7 ↔ 205.7				1	62.3	1.6		9.6	0.0		27.1	0.0		100%
9221	Round Whitefish	Upper River	Susitna River PRM 206.7	9/23/13	2/17/14	147	12			2	0.5	0.5	205.8 ↔ 206.3				1	39.3	0.8	1	6.7	1.9		17.8	0.0		100%
9223	Round Whitefish	Upper River	Susitna River PRM 196.4	9/23/13	11/13/13	51	12			2	0.1	0.1	196.9 ↔ 197					39.3	0.0	2	6.7	3.7		17.8	0.0		100%
9344	Round Whitefish	Upper River	Watana Creek TRM 0.1	6/6/14	6/23/15	382	2191	1	1	1	12.3	12.3	196.9 ↔ 209.2					74.0	0.0	1	10.5	7.4		67.6	0.0		100%
9346	Round Whitefish	Upper River	Watana Creek TRM 0.1	6/6/14	7/25/14	49																					
9369	Round Whitefish	Upper River	Susitna River PRM 206.7	6/7/14	9/17/14	102																					
9385	Round Whitefish	Upper River	Watana Creek TRM 0.1	6/8/14	6/23/15	380	13712	1	1	2	13.3	12.3	196.9 ↔ 209.2				1	73.1	0.9	1	10.1	3.3		54.8	0.0		100%
9387	Round Whitefish	Upper River	Susitna River PRM 198.9	6/8/14	9/5/14	89																					

Table A-6. Tag summary for individual fish during the spawning season (Page 9 of 9).

				Spawning Season																							
Tag ID	Species	Tagging Segment	Release Location	Release Date	Last Live Date	Days Active	Total Detections	Fixed Station Events	# Fixed Stations Detected	# Aerial Surveys Detected	Distance Traveled (RM)	Linear Home Range (mi)	Mainstem Range (PRM)	Movments Past Dam Site	Tributaries & Lakes	Tributary Range (TRM)	Mainstem Aerial Detections	Mainstem Survey Length (mi)	Mainstem Selection Ratio	Confluence Aerial Detections	Ave Confluence Survey Length (mi)	Confluence Selection Ratio	Tributary Aerial Detections	Ave Tributary Survey Length (mi)	Tributary Selection Ratio	Lake Aerial Detections	% Aerial Detections in ZHI
9389	Round Whitefish	Upper River	Susitna River PRM 198.9	6/8/14	6/4/15	361	24			2	1.3	1.3	199.2 ↔ 200.5				2	73.1	1.9		10.1	0.0		54.8	0.0		100%
9390	Round Whitefish	Upper River	Susitna River PRM 198.9	6/8/14	6/23/15	380	9			2	11.7	11.7	194 ↔ 205.7				2	73.1	1.9		10.1	0.0		54.8	0.0		100%
9505	Round Whitefish	Upper River	Susitna River PRM 247.3	9/2/14	10/14/14	42	4			1		1.5			Tyone River	1.5 ↔ 1.5		74.0	0.0		10.5	0.0	1	67.6	2.3		0%
9506	Round Whitefish	Upper River	Susitna River PRM 247.3	9/2/14	10/14/14	42	17			2	0.2	0.2			Tyone River	0.1 ↔ 0.3		73.1	0.0	1	10.1	3.2	1	54.8	1.3		0%
9524	Round Whitefish	Upper River	Susitna River PRM 213.6	9/4/14	1/6/15	124	10			2	2	2	232.6 ↔ 234.6				1	73.1	0.9	1	10.1	3.3		54.8	0.0		0%
9526	Round Whitefish	Upper River	Susitna River PRM 206.7	9/4/14	6/4/15	273	9596	2	1	2	1.9	0.9	208.3 ↔ 209.2				1	73.1	0.9	1	10.1	3.3		54.8	0.0		100%
9527	Round Whitefish	Upper River	Susitna River PRM 206.7	9/4/14	6/4/15	273	213	1	1	1	1.1	1.1	209.2 ↔ 210.3				1	74.0	2.1		10.5	0.0		67.6	0.0		100%
9528	Round Whitefish	Upper River	Susitna River PRM 206.7	9/4/14	6/23/15	292	8375	2	1	2	5.6	5.4	203.8 ↔ 209.2				1	73.1	0.9	1	10.1	3.3		54.8	0.0		100%
9529	Round Whitefish	Upper River	Susitna River PRM 206.7	9/4/14	2/19/15	168	17			2	0.1	0.1	211.2 ↔ 211.3				1	73.1	0.9	1	10.1	3.3		54.8	0.0		100%
9543	Round Whitefish	Upper River	Susitna River PRM 206.7	9/6/14	10/14/14	38	6			1			206 ↔ 206					74.0	0.0	1	10.5	7.4		67.6	0.0		100%
9544	Round Whitefish	Upper River	Susitna River PRM 206.7	9/6/14	10/2/14	26	4			1			201.5 ↔ 201.5				1	72.1	1.7		9.6	0.0		41.9	0.0		100%
9545	Round Whitefish	Upper River	Susitna River PRM 198.9	9/6/14	6/23/15	290	2			1			193.3 ↔ 193.3				1	72.1	1.7		9.6	0.0		41.9	0.0		100%
9551	Round Whitefish	Upper River	Susitna River PRM 198.9	9/7/14	1/6/15	121	6			1			195.2 ↔ 195.2				1	74.0	2.1		10.5	0.0		67.6	0.0		100%
9552	Round Whitefish	Upper River	Susitna River PRM 198.9	9/7/14	10/14/14	37	11			2	11.7	11.7	191.2 ↔ 202.9				2	73.1	1.9		10.1	0.0		54.8	0.0		100%
9553	Round Whitefish	Upper River	Susitna River PRM 198.9	9/7/14	10/16/14	39	31	1	1				187.2 ↔ 187.2														
9556	Round Whitefish	Upper River	Susitna River PRM 198.9	9/7/14	12/17/14	101	65	1	1	2	13.7	13.7	157.3 ↔ 171	1 ↓			2	41.3	2.0		6.0	0.0		34.7	0.0		100%
9557	Round Whitefish	Upper River	Susitna River PRM 198.9	9/7/14	9/22/14	15																					
9560	Round Whitefish	Upper River	Susitna River PRM 198.9	9/7/14	10/9/14	32	3067	3	3	1	31.9	31.9	167 ↔ 198.9	1 ↓			1	72.1	1.7		9.6	0.0		41.9	0.0		100%