10.11. Aquatic Furbearer Abundance and Habitat Use

10.11.1. General Description of the Proposed Study

The aquatic furbearer study will be conducted in 2013 and 2014. The study has been designed to elucidate the distribution of aquatic furbearers among habitats, to estimate population size for beavers, and to assess the relative abundance of other aquatic furbearers. Additional work will be done to provide information on the food habits and diets of piscivorous furbearers (river otter and mink) to inform the mercury assessment and bioaccumulation study.

10.11.1.1. Study Goals and Objectives

The goal of the aquatic furbearer study is to collect baseline data on aquatic furbearers in the study area to enable assessment of potential Project-related impacts. This information will be used to develop appropriate mitigation measures. Four species of aquatic furbearers occur in the Project area. The beaver is the most prominent aquatic furbearer statewide in terms of ecological and economic importance. Other aquatic furbearers in the Project area include river otter, mink, and muskrat (AEA 2011).

Five specific objectives have been identified for this study:

1) Delineate the distribution and estimate the current population size of beavers;
2) Describe the distribution and relative abundance of river otter, mink, and muskrat;
3) Describe habitat associations of aquatic furbearers;
4) Review available information on food habits and diets of piscivorous furbearers (river otter and mink) as background for the Mercury Assessment and Potential for Bioaccumulation study (Section 5.7); and
5) Collect and analyze fur samples from river otters and mink to characterize baseline tissue levels of mercury for the Mercury Assessment and Potential for Bioaccumulation study.

10.11.2. Existing Information and Need for Additional Information

Studies of aquatic furbearers for the original APA Susitna Hydroelectric Project proposed in the 1980s focused primarily on beavers and secondarily on muskrats; limited track surveys were conducted for river otters and mink. Beavers, which were selected to predict downstream impacts of the APA Susitna Hydroelectric Project on furbearers, were studied mainly downstream of the proposed dam site (Gipson et al 1982, 1984; Woolington et al. 1984, 1985; Woolington 1986). Aerial surveys were used to locate lodges and caches and to estimate population levels and overwinter survival, and boat surveys in summer were used to detect beaver sign. Surveys were conducted using boats and airplanes between Devils Canyon and Cook Inlet during summer 1980 and 1982; in general, beaver sign increased substantially with distance downriver from Devils Canyon (Gipson et al. 1982, 1984). Side channels and sloughs were the habitat types used most often. Caches, lodges, and dens were found most often in habitats that had silty banks, willows, and poplars nearby. Little or no sign of beaver activity was found in the mainstem Susitna River during summer surveys (Gipson et al. 1984). Away from the Susitna River, beaver sign was found along slow-flowing sections of most tributaries,

including Portage Creek, Indian River (especially along a tributary flowing out of Chulitna Pass), streams along the access alternative between Gold Creek and Devils Canyon, and Prairie Creek (Gipson et al. 1984).

Fall and spring counts of beaver lodges and food caches were conducted between Devils Canyon and Talkeetna (Gipson et al. 1984; Woolington et al. 1984, 1985; Woolington 1986). Fall counts were conducted annually during 1982–1985 and spring counts were conducted in 1984 and 1985. Between 1982 and 1985, the population in that area was estimated at 70–220 beavers. Aerial surveys for beavers (and muskrats) were conducted in the upstream study area during spring and summer 1980 (Gipson et al. 1982). Beaver colonies in the vicinity of the original APA Susitna Hydroelectric Project impoundment zones occurred mostly in lakes between 610 and 730 meter (2,000 and 2,400 feet) elevation. Colonies also were present in slow-moving sections of most of the larger tributaries, particularly Deadman Creek. No active beaver lodges or bank dens were found on the Susitna River upstream of Devils Canyon (Gipson et al. 1982), however.

Aerial surveys for muskrat pushups were flown upstream from Gold Creek during spring 1980 (Gipson et al. 1982). Muskrat sign was observed most often in lakes on plateaus above the river valley, at 610–730 meter (2,001–2,395 feet) elevation. Muskrats in the upstream area appeared to depend on fairly small, isolated areas of wetland habitats. Muskrats also were seen along slow-moving sections of creeks and at locations where creeks drained into larger streams, particularly near the Stephan Lake/Prairie Creek and Deadman Lake/Deadman Creek drainages.

Tracks of river otters and mink were recorded in the upper Susitna basin during the APA Susitna Hydroelectric Project studies in the 1980s, but the number of animals present was not estimated. Tracks were widespread but not abundant, although several unusually heavy concentrations of tracks (presumably representing a small number of animals spending an extended period in one area) were noted near river ice in early winter, the time of year when track surveys were conducted.

Data on the distribution, relative abundance, and movements of aquatic furbearers in GMU 13 is limited to that collected for the APA Susitna Hydroelectric Project, and that information is now 25–30 years old. Annual furbearer reports produced by ADF&G contain general abundance information obtained from trapper questionnaires (Schumacher 2010), but reports do not include drainage-specific population data. Current data on the abundance and distribution of aquatic furbearers is unavailable for GMU 13.

Current data on the abundance, distribution, and habitat use of aquatic furbearers is needed to enable analysis of Project impacts. A large body of research demonstrates that the beaver is a keystone species that exerts profound ecological effects on hydrology, geomorphology, vegetation, nutrient cycling, the productivity of aquatic and riparian habitats, and the distribution and abundance of fishes and other aquatic organisms (Butler 1995, Collen and Gibson 2001, Müller–Schwarze and Sun 2003, Rosell et al. 2005). As was the case for the APA Susitna Hydroelectric Project, current information on the abundance and distribution of beavers will be required. Additional data also will be needed to assess the current abundance and distribution of river otter and mink, including an effort to enumerate individual animals, particularly along the mainstem Susitna River and its clearwater tributaries. These baseline data are collected as input for the Mercury Assessment and Potential for Bioaccumulation Study, which was recommended by the USFWS in response to the request for comments and study requests on the Pre-

Application Document/FERC Scoping Document 1 for the Project (letter from USFWS to AEA dated 31 May 2012).

10.11.3. Study Area

The study area for aquatic furbearers will vary according to the species being surveyed (see Figure 10.11-1). Because of their ecological importance to riparian habitats, beavers will be surveyed from the reservoir impoundment zone downstream to the confluence of the Susitna and Chulitna rivers, as well as along access road corridors. In contrast, surveys of muskrats will be restricted to waterbodies and wetland areas likely to be affected by Project facilities and activities in the area of the dam and associated infrastructure, including the impoundment area. Surveys for river otters and mink will focus on the reservoir impoundment and nearby river stretches downstream from the proposed dam site, potentially using the same transect locations that were surveyed in the 1980s to obtain comparative data. Surveys will extend upstream along tributaries to provide comparative data on the extent of use of those drainages in comparison with the Susitna mainstem.

10.11.4. Study Methods

10.11.4.1. Field Surveys

Aerial surveys of beaver lodges and food caches will be conducted in a small helicopter to assess the distribution and abundance of beavers in the middle reach of the Susitna River below the proposed dam site (downstream extent to be informed by instream flow modeling, but extending at least far downstream as the Chulitna River confluence), the reservoir inundation zone in the upper basin, the proposed facilities and laydown/storage areas, and access road and transmission-line corridors. A survey will be flown each year in fall, shortly after deciduous trees have shed their leaves and before waterbodies freeze, to document the distribution and abundance of active colonies, as indicated by lodges and fresh food caches (Hay 1958, Payne 1981). Aerial surveys of active colonies located on the fall 2013 survey will be flown again in spring 2014 to estimate the overwinter survival of those colonies.

An aerial surveys of ponds and lakes will be conducted annually in a small helicopter in late winter to enumerate muskrat pushups in waterbodies in the portions of the study area in the upper basin that would be affected directly by Project infrastructure and activities.

Aerial surveys in a small helicopter will be flown at least once each year in early winter (October/November) and two to three times later each winter (February–early April) for snow-tracking of river otters and mink soon (within 3 days) after fresh snowfalls, generally following methods described by Reid et al. (1987) and Sulkava and Liukko (2007). Streams in the study area will be subdivided into sampling segments before the survey and tracks in each segment will be recorded as belonging to single or multiple animals. In general, it is expected that the tracks of river otters will be more readily located and followed during these surveys than will the tracks of mink. Wherever possible, tracks of river otters will be followed to obtain a count of group size, to delineate the length of river and streams traversed by the animals, and to evaluate the extent of use of the mainstem river and tributaries. All sightings of aquatic furbearers will be recorded with Global Positioning System (GPS) receivers for entry into a geospatial database for use in the wildlife habitat evaluation for the Project. [These otter and mink survey methods in

this interim draft RSP may be modified further following further consultation with Dr. Merav Ben-David of the University of Wyoming.]

Additional data on aquatic furbearers (primarily river otter and mink) also will be collected incidentally during winter track surveys and ground-based work for the terrestrial furbearer study (Section 10.10). In addition, historical and current data on harvest of aquatic furbearers in GMU subunits 13A, 13B, 13E, 14B, 16A and 20A will be synthesized for the separate wildlife harvest study, beginning in 2012 (AEA 2012) and continuing in 2013 and 2014 as additional data become available. Details of incidental sightings of aquatic furbearers will be requested from other Project researchers working on other wildlife surveys, as well as fish and water resources studies.

ADF&G management objectives are to maintain accurate annual harvest records based on sealing documents for those species that require sealing of hides and to develop specific population and harvest objectives. ADF&G requires that the pelts of river otters be sealed by an authorized ADF&G representative. This pelt-sealing requirement will provide an ideal opportunity to obtain hair samples from otters harvested in the study area for characterization of baseline mercury levels in tissues. Small amounts of hair will be taken from otter pelts for which reliable location information is available and will be sampled for methylmercury. Hair samples from mink will be more difficult to obtain, unless local trappers are working in the Project area. Another possibility for obtaining mink hair samples will be as incidental snags from the sampling being conducted for marten as part of the terrestrial furbearer study. If sufficient samples of river otter and mink fur cannot be obtained using these methods, then the use of hair-snag stations deployed along streams in the study area will be considered.

In addition to fur sampling, the scientific literature will be reviewed to locate and synthesize information on the food habits and diets of river otters and mink in freshwater aquatic systems, to support the pathways analysis being planned for the Mercury Assessment and Potential for Bioaccumulation Study.

10.11.4.2. Impact Assessment

The primary potential impact mechanisms of the proposed Project on aquatic furbearer populations could involve two broad categories:

- direct and indirect habitat loss and alteration, and
- changes in mortality rates from increased human harvest as a result of improved access.

For aquatic furbearers, direct and indirect habitat loss and alteration will occur in the impoundment area, access and transmission corridors, and other facility footprints as well as downstream of the dam site, where altered flow regimes will alter riparian habitats. Variable winter flows in the Susitna River may result in direct or indirect mortality of beavers. Other potential impacts, including death or injury due to vehicle strikes or exposure to contaminants, may affect relatively small numbers of aquatic furbearers.

Data on the distribution, abundance, and habitat use of aquatic furbearers in the study area can be used to assess Project impacts. Location data collected for all four species of aquatic furbearers will identify important habitats in the Project area for each species. For beavers and muskrats, additional quantitative data on the abundance of beaver colonies, muskrat pushups, and river otter groups can be used to obtain estimates of the number of animals potentially affected by

Project development. For all four species, direct habitat loss and habitat alteration that would result from the Project can be evaluated by overlaying furbearer location data and the Project features (including the reservoir impoundment, related infrastructure areas, and access road and power transmission corridors) onto the habitat map that will be developed under the botanical resources study plans (see Sections 11.5, 11.6, and 11.7). Additional indirect habitat loss and alteration also can be estimated by applying various buffer distances from proposed Project features, as determined from the available information on the anticipated effects. In this way, the GIS analysis can incorporate information from the literature to estimate the geographic extent, frequency, duration, and magnitude of Project effects on aquatic furbearers. Results from the geomorphology, instream flow, and riparian habitat studies will provide the information needed to evaluate potential effects on aquatic furbearer habitats downstream, such as those resulting from reduced spring flows. Any necessary PM&E measures will be developed by examining the distribution and abundance of species among habitats in relation to the geographic extent and seasonal timing of various Project activities.

An analysis of harvest data that are collected by ADF&G (described in Section 10.20) can provide baseline information with which to assess the potential effects of increased subsistence and recreational harvest of aquatic furbearers.

Documentation of the distribution and relative abundance of piscivorous furbearers (river otter and mink) and characterization of their dietary habits will provide information for the pathways analysis being planned for the Mercury Assessment and Potential for Bioaccumulation Study.

10.11.5. Consistency with Generally Accepted Scientific Practice

Survey methods for beaver colonies, muskrat structures, and winter track surveys follow standard practices for recording aquatic furbearers and their sign (Dozier 1948, Hay 1958, Payne 1981, Proulx and Gilbert 1984, Reid et al. 1987, Sulkava and Liukko 2007). The proposed methods for river otter and mink will focus on assessing relative abundance and minimum counts of those species, rather than using the more intensive sample-unit probability estimator techniques (Becker 1991, Becker et al. 2004) required to generate population estimates with accompanying variance estimates. The aquatic furbearer surveys generally will be similar to surveys conducted for the APA Susitna Hydroelectric Project during the 1980s (Gipson et al. 1982, 1984), except that no boat surveys of beaver are proposed because helicopter surveys will be more efficient. Habitat availability and habitat-use analyses allow an ecosystem approach to impact assessment and GIS-based analysis has become a standard method of quantifying the spatial impacts of habitat loss and alteration.

10.11.6. Schedule

This study will be conducted in 2013 and 2014, as described below:

2013

February–April	Two to three aerial surveys of river otter and mink tracks (following fresh snowfalls); literature review of food habits and diets of piscivorous furbearers in freshwater aquatic systems; collection of furbearer hair samples from trapper-harvested animals for mercury analysis.
April	Aerial survey of muskrat pushups.

May	Aerial survey of beaver colonies to assess overwinter survival; analysis of first winter survey results and literature review.
October	Aerial survey of lodges and fresh food caches to locate active beaver colonies.
November	Aerial track survey of river otters and mink (following fresh snowfall).
2014	
February	Initial Study Report completed.
February–April	Two to three aerial surveys of river otter and mink tracks (following fresh snowfalls); collection of furbearer hair samples from trapper-harvested animals for mercury analysis.
April	Aerial survey of muskrat pushups.
May	Aerial survey of beaver colonies to assess overwinter survival; analysis of second winter survey results.
October	Aerial survey of lodges and fresh food caches to locate active beaver colonies.
November	Aerial track survey of river otters and mink (following fresh snowfall).
2015	
February	Data analysis and Updated Study Report completed.

10.11.7. Level of Effort and Cost

Aerial surveys using a small piston helicopter will be conducted in fall, winter, and spring beginning in 2013 and extending through 2014 to assess the relative abundance and habitat use of aquatic furbearers in the Project area.

Beaver surveys will require up to a week of survey effort in October each year and 2–3 days in spring. Winter track surveys for river otter and mink, estimated to require approximately 3–5 days each, will be conducted in early winter (November) and two to three times in mid- to late winter (February to April), depending on the occurrence of fresh snowfall suitable for tracking. Surveys of muskrat pushups will be conducted in late winter (April) each year.

Collection of hair samples from river otters will be solicited from trappers working in the Project area and from ADF&G as part of their required pelt-sealing procedure. Collection of hair samples from mink will be more challenging, involving collection of hair samples from marten traps during the terrestrial furbearer survey, or through direct contact with local trappers, or both.

Project costs in 2013 and 2014 are estimated to be less than $150,000 annually (not including helicopter charter costs).

10.11.8. Literature Cited

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10.11.9. Figures

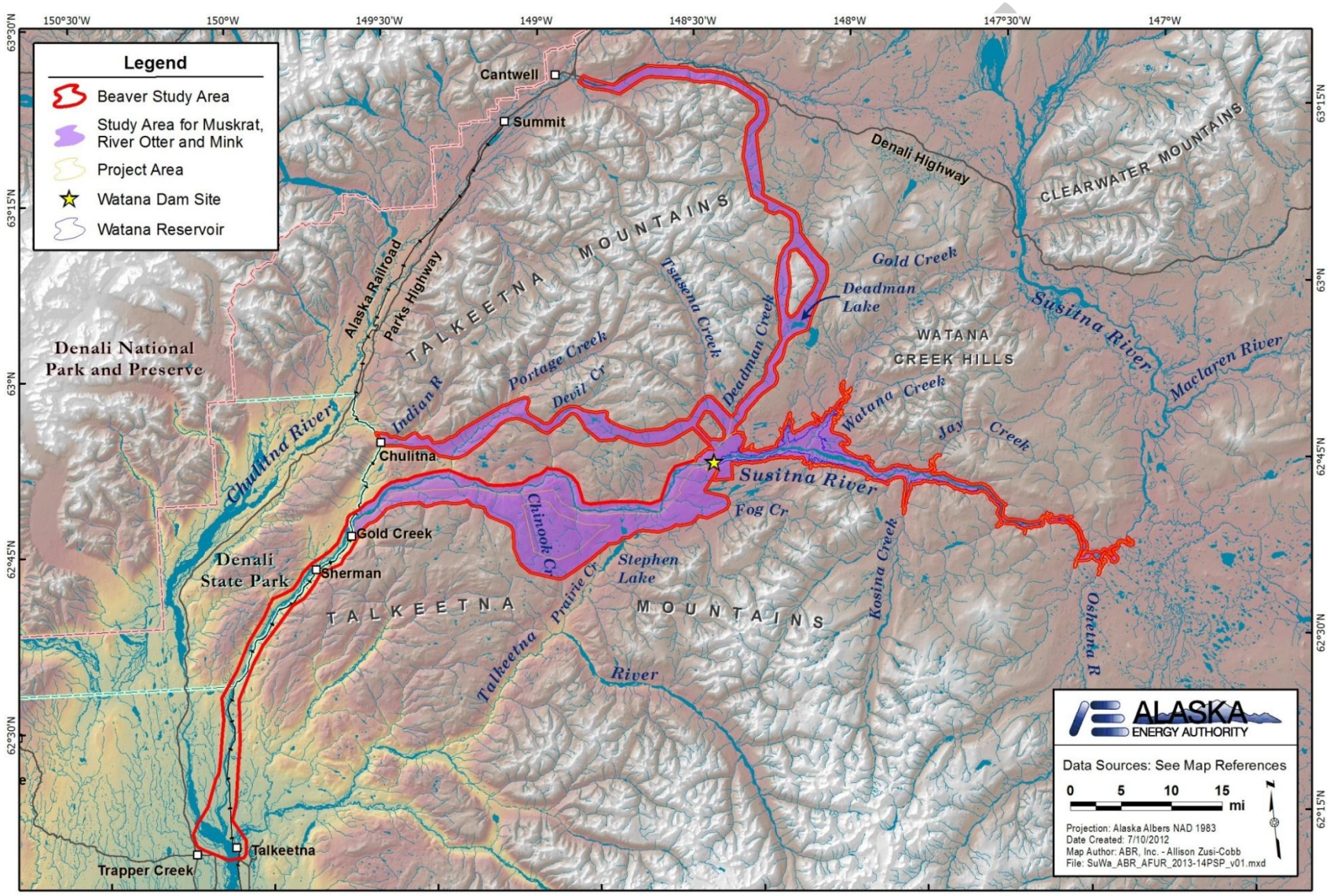

Figure 10.11-1. Aquatic furbearer study areas. TO BE REVISED FOR RSP