SUSITNA-WATANA HYDRO *Clean, reliable energy for the next 100 years.*

SUSITNA-WATANA HYDROELECTRIC PROJECT

Fish and Aquatic Resources Technical Work Group Meeting 4th Quarter 2013

December 4, 2013

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RSP	RSP Title	4th Quarter 2013 Activity
9.5	Fish Distribution and Abundance Upper River	3rd field event completed, RST and Pit demobilization, working on data management QAQC and ISR development
9.6	FDA Middle and Lower River	3rd field event completed, RST and Pit demobilization, working on data management QAQC and ISR development
9.7	Salmon Escapement	Demobilization of Fish Wheels, tagging
9.8	River Productivity	3rd field event completed, colonization study completed, samples sent for analysis, working on data management and QAQC, white paper and ISR development
9.9	Habitat Characterization	Field season completed, data management and QAQC ongoing, ISR development

RSP	RSP Title	4th Quarter 2013 Activity
9.10	Future Reservoir and Entrainment	ISR development
9.11	Fish Passage Feasibility	Development of biological tool, update of biological appendices, ISR development
9.12	Fish Passage Barriers Middle and Upper River	Field work completed, data management and QAQC ongoing, ISR development
9.13	Access, Alignment, Transmission and Construction Area	ISR development
9.14	Genetic Baseline	ISR development
9.15	Fish Harvest	ISR development
9.16	Eulachon Run Timing, Distribution, and Spawning	Data management and QAQC, ISR development
9.17	Cook Inlet Beluga Whales	Data management and QAQC, ISR development

9.05 FDAUP – Broadcast Sampling

Fall Event

Sept 10 to Oct 4

Tributaries

- 81 out of 101 GRTS sampling sites and 1 Direct Tributary
- No access or landing zones limited sampling sites

Mainstem

- 16 out of 20 transects sampled
- Dangerous conditions precluded sampling at 4 targeted transects

- Method effectiveness varies by habitat and lifestage

9.05 FDAUP–Macrohabitats

Tributaries

- 153 mesohabitat units
- 8 off-channel;145 main channel units

Tributary	Main	Split Main	Multi-Split Main	SC	SS	SSBC	US	USBC	Total
Oshetna River	15	5		6	1				**27**
Black River	4	2	1	2			2		**11**
Goose Creek	19	10		9					**38**
Kosina Creek		1	7	3					**11**
Tsisi Creek	2	4	1	2	1				**10**
Jay Creek[a]	5								**5**
Unnamed - 206.3[b]									**0**
Unnamed - 204.3[b]									**0**
Unnamed - 197.7[b]									**0**
Watana Creek	20	3	3	1	2	1			**30**
Watana Creek R5	12	3		1	1				**17**
Unnamed - 194.8	4								**4**
Total	**81**	**28**	**12**	**24**	**5**	**1**	**2**	**0**	**153**

Notes:

[a] This stream was sampled under the direct sample approach

[b] Land status and lack of LZ's precluded sampling effort in these streams.

9.05 FDAUP–Macrohabitats

Mainstem

- 4 off-channel/lateral habitat units sampled
- 18 main channel units sampled

Geo Reach	Transect PRM	Main	Split Main	SC	SS	Trib Plume	Total
Upper River 3	233.9	1					1
	231.5	1					1
	229.1[a]						0
	226.7[a]						0
UR 3 Total		2					2
Upper River 4	224.3	1					1
	221.9[a]						0
	219.5	1				1	2
	217.1	1				1	2
	214.7	1					1
	212.3	1				1	2
	209.9		1				1
UR 4 Total		5	1			3	9

Geo Reach	Transect PRM	Main	Split Main	SC	SS	Trib Plume	Total
Upper River 5	207.5	1					1
	205.1	1					1
UR 5 Total		2					2
Upper River 6	202.7		1	1			2
	200.3		1	1			2
	197.9	1					1
	195.5	1			1		2
	193.1	1					1
	190.7	1					1
	188.3 [a]						0
UR 6 Total		4	2	2	1		9
Grand Total		13	3	2	1	3	22

Note: [a] These transects were too dangerous to sample

9.05 FDAUP – Sampling Lateral Macrohabitats

Off-channel Habitat	Stream Type	Snorkel	Minnow Trap	BP E-fish	Boat E-fish	Angling
Clear water plume	Tributary					
	Mainstem		3	2	1	
Side Slough	Tributary	1	4	6		1
	Mainstem		1	1	1	
Trib mouth	Tributary		1	1		
	Mainstem					
Upland Slough	Tributary		2	2		2
	Mainstem					
Total	**Tributary**	**1**	**7**	**9**	**0**	**3**
	Mainstem	**0**	**4**	**3**	**2**	**0**
Grand Total		**1**	**11**	**12**	**2**	**3**

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9.05 FDAUP – Sampling MC Macrohabitats

Tributary	Mainchannel Habitat	Count of habitats	Minnow Trap	BP E-Fish	Snorkel	Angling
Oshetna River	MC	15	4	15		14
	Split MC	5	3	5		5
	SC	6	3	6		4
Black River	MC	4	4	4		4
	Split MC	2	2	2		
	Multi Split MC	1	1	1		1
	SC	2	2	2		1
Goose Creek	MC	19	19	19	11	6
	Split MC	10	9	10	3	7
	SC	9	8	9	3	2
Kosina Creek	Split MC	1	1	1		
	Multi Split MC	7	7	7	4	3
	SC	3	3	3	2	
Tsisi Creek	MC	2	2	2	2	
	Split MC	4	4	4	4	
	Multi Split MC	1	1	1	1	
	SC	2	1	2	2	
Jay Creek	MC	5	5	5	2	2
Watana Creek	MC	20	13	18	9	4
	Split MC	3	2	3	1	1
	Multi Split MC	3	3	3	3	
	SC	1		1		
Watana Creek R5	MC	12	12	11	7	3
	Split MC	3	3	3	3	
	SC	1	1	1	1	
Unnamed - 194.8	MC	4	4	4	1	
Total		**145**	**117**	**142**	**59**	**57**

Tributaries

- 9 UR tributaries
- Primary Gear: Minnow traps, E-fish and snorkel
- Secondary Gear: Angling
- Freezing temps and fringe-ice limited snorkeling

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9.05 FDAUP – Sampling MC Macrohabitats

Mainstem

- Primary Gear: Minnow traps; E-fish
- Secondary Gear: Seine

Geo Reach	Mainchannel Habitat	Count of Habitats	Minnow Trap	Boat E-Fish	BP E-Fish	Seine
Upper River 3	MC	2	1	2	2	
Upper River 4	MC	5	5	6	5	
	Split MC	1	1	1	1	
Upper River 5	MC	2	2	2	2	
Upper River 6	MC	4	3	4	4	1
	Split MC	2	2	1	2	1
	SC	2	2		2	2
Total		**18**	**16**	**16**	**18**	**4**

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9.05 FDAUP – Species/Lifestage Counts by Gear Type

Tributaries

- Minnow traps and E-fishing captured more species/lifestages
- Snorkeling and Angling effective for adult Arctic grayling

Species	Lifestage	Minnow Trap (n=117[a])	BP E-Fish (n=142[a])	Snorkel (n=59[a])	Angle (n=57[a])	Total
Arctic grayling	Adult		55	123	35	213
	Juv/Adt	1	60	13	3	77
	Juvenile	15	189	35	2	241
GRA Total		**16**	**304**	**171**	**40**	**531**
Burbot	Adult	2				2
	Juv/Adt	1	2			3
	Juvenile		11			11
GBR Total		**3**	**13**			**16**
Chinook salmon	Juvenile	14	27			41
SCK Total		**14**	**27**			**41**
Dolly Varden	Adult	3	46			49
	Juv/Adt	4	22	2		28
	Juvenile	5	22			27
CDV Total		**12**	**90**	**2**		**104**
Longnose sucker	Juvenile		1			1
NOS Total			**1**			**1**
Round whitefish	Juvenile		3			3
WRN Total			**3**			**3**
Sculpin	Adult	36	183	1		220
	Juv/Adt	53	90			143
	Juvenile		79			79
ULP Total		**89**	**1,063**	**1**		**1,153**
Slimy sculpin	Juv/Adt	1				1
USL Total		**1**				**1**
Grand Total		**135**	**1,501**	**174**	**40**	**1,850**

Notes: [a] Values represent number of sample sites used

9.05 FDAUP – Species/lifestage Counts by Gear Type

Mainstem

- E-fishing captured more species/ lifestages
- Boat e-fishing more effective for adults; BP e-fishing more effective for juveniles
- Minnow traps ineffective
- Seine effective when suitable habitat

	Species	Lifestage	Minnow Trap	Boat E-Fish	BP E-Fish	Seine	Total
Upper River 3	Arctic grayling	Adult		14	12		26
		Juv/Adt			19		19
		Juvenile			1		1
	GRA Total			**14**	**32**		**46**
	Burbot	Juv/Adt		1	2		3
		Juvenile		1			1
	GBR Total			**2**	**2**		**4**
	Longnose sucker	Juv/Adt			1		1
	NOS Total				**1**		**1**
	Round whitefish	Adult		4	7		11
		Juv/Adt			3		3
		Juvenile			2		2
	WRN Total			**4**	**12**		**16**
	Sculpin	Juv/Adt			1		1
		Juvenile			2		2
	ULP Total				**3**		**3**
	UR-3 Total			***20***	***50***		***70***
Upper River 4	Arctic grayling	Adult		10	5		15
		Juv/Adt		2	10		12
		Juvenile		1	2		3
	GRA Total			**13**	**17**		**30**
	Burbot	Adult		7	5		12
		Juv/Adt			2		2
		Juvenile	1		1		1
	GBR Total		**1**	**7**	**8**		**15**
	Longnose sucker	Adult		5	2		7
	NOS Total			**5**	**2**		**7**
	Round whitefish	Adult		9	5		14
	WRN Total			**9**	**5**		**14**
	Sculpin	Adult		1	30		31
		Juv/Adt			17		17
		Juvenile		1			1
	ULP Total			**2**	**47**		**49**
	UR-4 Total		***1***	***36***	***79***		***115***

	Species	Lifestage	Minnow Trap	Boat E-Fish	BP E-Fish	Seine	Total
Upper River 5	Arctic grayling	Adult		10			10
		Juv/Adt			6		6
	GRA Total			**10**	**6**		**16**
	Round whitefish	Adult		7			7
		Juv/Adt		2			2
		Juvenile			1		1
	WRN Total			**9**	**1**		**10**
	Sculpin	Adult	1		18		19
	ULP Total		**1**		**18**		**19**
	UR-5 Total		***1***	***19***	***25***		***45***
Upper River 6	Arctic grayling	Adult		70	8		78
		Juv/Adt	1	13	9	5	28
		Juvenile			7	2	9
	GRA Total		**1**	**83**	**24**	**7**	**115**
	Burbot	Adult			1		1
	GBR Total				**1**		**1**
	Longnose sucker	Adult			3		3
		Juvenile	1		3	12	16
	NOS Total		**1**		**6**	**12**	**19**
	Round whitefish	Adult		6			6
		Juv/Adt		2			2
		Juvenile			1	3	4
	WRN Total			**8**	**1**	**3**	**12**
	Sculpin	Adult	6		57		63
		Juv/Adt			10		10
		Juvenile			6		6
	ULP Total		**6**		**73**		**79**
	UR-6 Total		***8***	***91***	***105***	***22***	***226***
	Total		**10**	**166**	**259**	**22**	**457**

Preliminary data, may not contain all data sources, subject to QC

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9.05 FDAUP – Gear Type Selectivity

Tributaries

Species	Minnow Trap (n=117 [a])	BP E-Fish (n=142 [a])	Snorkel (n=59 [a])	Angle (n=57 [a])	Total
Arctic Grayling	16	304	171	40	531
Burbot	3	13			16
Chinook salmon	14	27			41
Dolly Varden	12	90	2		104
Longnose sucker		1			1
Round whitefish		3			3
Sculpin	89	1,063	1		1,153
Slimy sculpin	1				1
Total	135	1,501	174	40	1,850

Notes: [a] Values represent number of sample sites used

Mainstem

Reach	Species	Minnow Trap	Boat E-Fish	BP E-Fish	Seine	Total
Upper River 3	Arctic grayling		14	32		46
	Burbot		2	2		4
	Longnose sucker			1		1
	Round whitefish		4	12		16
	Sculpin			3		3
	UR-3 Total		**20**	**50**		**70**
Upper River 4	Arctic grayling		13	17		30
	Burbot	1	7	8		16
	Longnose sucker		5	2		7
	Round whitefish		9	5		14
	Sculpin		2	47		49
	UR-4 Total	**1**	**36**	**79**		**116**
Upper River 5	Arctic grayling		10	6		16
	Burbot					0
	Longnose sucker					0
	Round whitefish		9	1		10
	Sculpin	1		18		19
	UR-5 Total	**1**	**19**	**25**		**45**
Upper River 6	Arctic grayling	1	83	24	7	115
	Burbot			1		1
	Longnose sucker	1		6	12	19
	Round whitefish		8	1	3	12
	Sculpin	6		73		79
	UR-6 Total	**8**	**91**	**105**	**22**	**226**
	Grand Total	**10**	**166**	**259**	**22**	**457**

Tributaries

- E-fishing most effective overall
- Minnow traps low CPUE, but capture most species
- Snorkel most effective for Arctic grayling but less applicable than e-fishing

Mainstem

- E-fishing most effective and applicable
- Minnow traps ineffective

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9.05 FDAUP – Fish Counts by macrohabitats

Tributaries

- Includes observation counts (snorkel)
- Sculpin and Arctic grayling were most widespread and dominant
- Dolly Varden were uncommon overall, but locally abundant

	Oshetna River				Black River					Goose Creek			Kosina Creek			Tsisi Creek					Jay Creek	Watana Creek						Watana Creek R5				Unnamed - 194.8	
Species	MC	SMC	SC	SS	MC	SMC	MSMC	SC	US	MC	SMC	SC	SMC	MSMC	SC	MC	SMC	MSMC	SC	SS	MC	MC	SMC	MSMC	SC	SS	SSBC	MC	SMC	SC	SS	MC	Total
Arctic grayling	30	2	36	1	15	4		6	1	71	43	18	16	22	39	5	10	2	7	3	21	45	11					54	68	1			**531**
Burbot	7		1		4			2													2												**16**
Dolly Varden																					24	12	7	1		33		12				15	**104**
Chinook salmon			1		8		1	1						25	5																		**41**
Longnose sucker			1																														**1**
Round whitefish			3																														**3**
Sculpin	226	63	102	22	65	39	12	35	49	31	6	13		104	56	9	52	17	14	26	9	55	24	31	7	2	3	23	2		2	54	**1,153**
Slimy sculpin	1																																**1**
Total	**264**	**65**	**144**	**23**	**92**	**43**	**13**	**44**	**50**	**102**	**49**	**31**	**16**	**151**	**100**	**14**	**62**	**19**	**21**	**29**	**56**	**112**	**42**	**32**	**7**	**35**	**3**	**89**	**70**	**1**	**2**	**69**	**1,850**

Preliminary data, may not contain all data sources, subject to QC

9.05 FDAUP – Fish Counts by macrohabitats

Mainstem

- Includes observation counts
- Sculpin and Arctic grayling were most widespread and dominant
- Burbot were rare downstream of Upper River Reach 4

	Upper River 3	Upper River 4		Upper River 5	Upper River 6			
Species	Mainchannel	Mainchannel	Trib Plume	Mainchannel	Mainchannel	Sidechannel	Side Slough	Total
Arctic grayling	46	23	7	16	108	6	1	**207**
Burbot	4	11	5			1		**21**
Longnose sucker	1	2	5			17	2	**27**
Round whitefish	16	8	6	10	9	3		**52**
Sculpin	3	21	28	19	37	26	16	**150**
Total	**70**	**65**	**51**	**45**	**154**	**53**	**19**	**457**

Preliminary data, may not contain all data sources, subject to QC

9.06 FDA UP – Variances

- Sample unit lengths shortened to accommodate logistical limitation and maintain seasonal sampling scheme.
- Access limited number of transects and tributary sampling.
- Relative abundance sampling conducted using one pass electrofishing, snorkeling and sampling.
- Lengths on 25 fish per species per sample day.

9.06 FDA ML – Broadcast Sampling

Fall Event

- Sept 19 to Oct 3
- 45 off-channel GRTS sites in 9 FAs
- 77 GRTS mainstem sites in 10 FAs
- 86 GRTS sites outside of FAs

Method effectiveness varies by habitat and lifestage

Some freezing conditions in off-channel habitat and margins

9.06 FDA ML – Macrohabitats

- 76 of 79 targeted sites sampled in FAs
- 86 of 98 targeted sites sampled outside of FAs
- Access issues prevented sampling in 13 out of 177 sites

Geo Reach	Main		Split Main		Multiple Split Main		SC		CWP		TRIB		TM		SS		SSBC		US		USBC		BW		Total	Target
	FA	NFA	FA	NFA	FA	NFA	FA	NFA	FA	NFA	FA	NFA	FA	NFA	FA	NFA	FA	NFA	FA	NFA	FA	NFA	FA	NFA		
MR-1	2	3	1				2	1																	9	9
MR-2	3	1		1			3	3	1	3	0[a]	0[a]	1	2	3	3			0[a]	0[a]			1	1	26	36
MR-5	2	2		1					1		0[a]		0[a]	0[a]		3									9	12
MR-6	1	3	1		1		3	3	1	2	2	2	2	3	3	3	3	1	3	1	3	3	1	3	48	51
MR-7	1	1	1	2	1		3	3	1	1	3	3	1	2		3		3	3	1[b]	3	5[c]	2	1	44	43
MR-8	3	2		1			3	3			1				3	3			3	3				1	26	26
Total	12	12	3	5	2		14	13	4	6	6	5	4	7	9	15	3	4	9	5	6	8	4	6		
Grand Total	24		8		2		27		10		11		11		24		7		14		14		10		162	177
																								FA Grand Total	76	79
																								Non FA Grand Total	86	98

Notes: Preliminary Data

a: Site not accessible to sample

b: Two of the classified Upland Sloughs w/o Beaver Complexes were found upon visitation to support beaver activity and were reclassified

c: Two additional Upland Sloughs in Beaver Complexes were added due to observed beaver activity in classified Upland Sloughs w/o Beaver Complexes

9.06 FDA ML – Sampling Lateral Macrohabitats

Off-channel habitat	Snorkel	Minnow Trap	Seine	BP E-fish	Fyke Net	Angling	Hoop Trap
Backwater	1	9	6		7	1	
Clear water plume	16	6	13	4	1	10	
Side slough	56	45	22	25	9		1
Trib mouth	21	17	2	12		4	
Trib	40	33	7	11	1	7	2
Upland slough	43	56	31	11	16	2	2
Total	177	166	81	63	34	24	5

9.06 FDA ML – Tributary Mouths

- 22 MR tributaries
- Sampling in tributary or within zone of hydrologic influence
- Minnow trapping, E-fish and snorkeling

Tributary	Geo Reach	FA	PRM	Habitat	Minnow Trap	E-fish	Snorkel	Angling	Seine	Hoop trap
Tsusena Creek	MR-2	na	184.6	Tributary*	X	X	X			
				CWP		X		X		
Unnamed 184.0	MR-2	na	184	CWP	X	X				
Fog Creek	MR-2	na	179.3	Tributary*	X	X	X	X		
				Mouth	X	X				
				CWP	X	X	X			
Fog Creek Trib	MR-2	na	179.3	Tributary*	X	X	X			
Unnamed 177.2	MR-2	na	177.2	Mouth	X	X				
Unnamed 173.8	MR-2	173	173.8	Mouth	X	X	X			
				CWP	X		X	X	X	
Chinook Creek	MR-3	na	155.9	Tributary*	X	X	X			
Portage Creek	MR-5	151	152.3	CWP	X		X	X	X	
Jack Long Creek	MR-6	na	148.3	CWP	X	X		X		
				Mouth	X	X		X		
Indian River	MR-6	141	142.1	Tributary ZHI	X	X	X	X	X	
				Mouth	X	X	X	X		
				CWP			X	X	X	
Fourth of July Creek	MR-6	na	134.3	CWP	X	X		X		
				Mouth	X	X		X		

Tributary	Geo Reach	FA	PRM	Habitat	Minnow Trap	E-fish	Snorkel	Angling	Seine	Hoop trap
Sherman Creek	MR-6	na	134.1	Tributary ZHI	X	X	X			
Unnamed 133.2	MR-6	na	133.2	Mouth	X	X				
Skull Creek	MR-6	128	128.1	Tributary ZHI		X	X		X	
				Mouth		X	X		X	
Fifth of July Creek	MR-6	na	127.3	Tributary ZHI	X		X	X		
Unnamed 119.4	MR-7	na	119.4	Tributary ZHI	X	X				
Lane Creek	MR-7	na	117.2	Tributary ZHI	X					
				Mouth	X	X		X		
				CWP	X	X		X		
Unnamed 115.4	MR-7	115	115.4	Tributary ZHI	X		X		X	
Gash Creek	MR-7	113	115	Tributary ZHI	X	X	X			
				CWP			X		X	
Unnamed 113.7	MR-7	113	113.7	Tributary ZHI	X		X			
				Mouth	X	X	X			
Unnamed 110.5	MR-7	na	110.5	Tributary ZHI	X	X		X		
Whiskers Creek	MR-8	104	105.1	Tributary ZHI	X	X	X			X
				CWP	X	X	X			

*directed sampling efforts part of tributary sampling
ZHI= zone of hydrologic influence near confluence with Susitna River

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9.06 FDA ML – Slough Mouths

- 22 slough mouths sampled
- Some backwaters selected prior to sampling
- All sloughs checked for backwater habitat and sampled when present
- Site length for backwaters varied with extent of influence

No.	Site Key	FA	Geo Reach	Habitat	Dates Sampled		
1	FDA-173-17-BW	173	MR-2	BW SS Mouth	7/27	9/1	9/30
2	MR-2-015	na	MR-2	SS Mouth	8/12	9/5	10/3
3	MR-2-054	na	MR-2	BW SS Mouth	8/11	9/4	10/4
4	MR-5-026	na	MR-5	SS Mouth	7/26	8/26	9/23
5	FDA-128-70-SS	128	MR-6	SS Mouth	7/24		
6	FDA-138-76-US	138	MR-6	US Mouth	8/9	9/8	9/24
7	FDA-138-o77-US	138	MR-6	US Mouth	8/9	9/8	9/24
8	FDA-141-58-BW1	141	MR-6	BW US Mouth	7/24	8/28	
9	FDA-144-68-US	144	MR-6	US Mouth	8/6	9/10	9/28
10	MR-6-070	na	MR-6	BW US Mouth	7/22	8/17	9/26
11	MR-6-072	na	MR-6	BW US Mouth	7/24	8/17	9/20
12	FDA-115-109-BW1	115	MR-7	BW US Mouth	8/1	9/9	9/29
13	FDA-114-110-BW2	115	MR-7	BW US Mouth	8/1	9/4	9/28
14	FDA-115-120-US1	115	MR-7	US Mouth	8/1	9/4	9/30
15	MR-7-050	na	MR-7	BW US Mouth	7/20	8/12	9/15
16	SUS_03_07_NFOS3	na	MR-7	SS Mouth		9/6	10/3
17	FDA-104-156-SS1	104	MR-8	SS Mouth	7/18	8/20	9/19
18	FDA-104-162-US1	104	MR-8	US Mouth	7/24	9/1	9/23
19	FDA-104-154-SC1	104	MR-8	SC Mouth	7/23	8/31	9/23
20	MR-8-118	na	MR-8	SS Mouth	7/17	8/11	9/10
21	MR-8-117	na	MR-8	SS Mouth	7/18	8/11	9/10
22	MR-8-199-OS	na	MR-8	SS Mouth	7/20	8/12	9/11

9.06 FDA ML – Beaver Complex

- 19 beaver complexes (# pools TBD)
- Upland slough and side slough
- Minnow trapping & electrofishing primary
- Snorkel and fyke net secondary

Geo Reach	FA	Habitat	Minnow Trap	E-fish	Snorkel	Fyke Net	Angling	Seine
MR-6	141	US - BC	X	X		X		
MR-6	141	US - BC	X			X		X
MR-6	141	US - BC	X			X		X
MR-6	128	SS - BC		X	X			X
MR-6	128	SS - BC	X	X	X			
MR-6	128	SS - BC		X	X	X		
MR-6	na	SS - BC	X	X				
MR-6	na	US - BC	X	X	X			
MR-6	na	US - BC	X	X				
MR-6	na	US - BC	X		X		X	
MR-7	115	US - BC	X		X	X		
MR-7	115	US - BC	x		X	X		
MR-7	115	US - BC	X		X			
MR-7	na	SS - BC	X				X	
MR-7	na	SS - BC	X	X				
MR-7	na	SS - BC	X				X	
MR-7	na	US - BC	X	X			X	
MR-7	na	US - BC	X	X			X	
MR-7	na	US - BC	X	X				

9.06 FDA ML – Split Main Channels

- Boat and backpack electrofishing primary
- Seine, minnow trapping and drift gill nets secondary

SiteKey	GM Reach	FA	Macro hab	Meso hab	BP E-fish	Boat E-fish	Seine	Minnow Trap	Gill Net Drift
FDA-184-3-MC1	MR-1	184	Split MC	Run	X	X			X
MR-2_Site-13	MR-2	na	Split MC	Run	X	X		X	
MR-5_Site-26	MR-5	na	Split MC	Run	X	X		X	
FDA-141-62-MC1	MR-6	141	Split MC	Run	X	X	X		X
FDA-141-62-MC2	MR-6	141	Split MC	Riffle	X		X		
FDA-138-61-MC1	MR-6	138	Multi Split MC	Run	X	X	X		
FDA-138-61-MC2	MR-6	138	Multi Split MC	Riffle	X				
MR-7_Site-43	MR-7	na	Split MC	Run	X	X		X	
MR-7_Site-44	MR-7	na	Split MC	Run		X	X	X	
FDA-113-112-MC1	MR-7	113	Split MC	Run	X	X	X		
FDA-113-112-MC2	MR-7	113	Split MC	Riffle	X				X
FDA-115-113-MC2	MR-7	115	Multi Split MC	Riffle	X		X		X
MR-8_Site-52	MR-8	na	Split MC	Run	X	X	X		

9.06 FDA ML – Fish Counts by gear type

- Primary techniques captured a variety of species
- Fyke nets and seining also effective
- Gears are species selective

Species	Angling	DMT	E-fish, boat	E-fish, BP	Fyke net	Gill net, drift	Hoop trap	Minnow trap	Seine	Snorkel	Trot line	Total
Burbot		26	9	86	92		27	107	9		1	**357**
Chinook salmon	31	1,499		28	169		2	489	233	82		**2,533**
Chum salmon		422	2	9	14	2	10	1	57	363		**880**
Coho salmon	13	2,588	11	313	819		25	2,008	543	1,237		**7,557**
Dolly varden	1	34	2	46	11		1	34	4	92		**225**
Grayling	44	248	97	382	145		7	20	296	690		**1,929**
Lamprey		3		27	20			2		1		**53**
Longnose sucker		157	27	373	143		25	210	204	129		**1,268**
Pink salmon	19	1,420	2	1			33		33	3,086		**4,594**
Rainbow trout	15	128	14	21	59		5	57	9	52		**360**
Salmonid, undiff		91	6	5	336	3	1	81	17	274		**814**
Sculpin		353	25	3,014	34		3	567	210	227		**4,433**
Sockeye salmon		397	9	84	155			47	617	701		**2,010**
Stickleback		3		150	1,841			3,613	505	117		**6,229**
Whitefish, hb		74	9		2				15			**100**
Whitefish, rd		186	86	65	39		2	8	119	7		**512**
Whitefish		436	3	12	4			1	98	11		**565**
Total	**123**	**8,065**	**302**	**4,616**	**3,883**	**5**	**141**	**7,245**	**2,969**	**7,069**	**1**	**34,419**

Preliminary data, may not contain all data sources, subject to QC

9.06 FDA ML – Fish Counts FA/Non FA

Geo Reach	Focus Area	Burbot	Chinook salmon	Chum salmon	Coho salmon	Dolly Varden	Grayling	Lamprey	LN sucker	Pacific salmon	Pink salmon	Rainbow trout	Sculpin	Sockeye salmon	Stickleback	Whitefish, hb	Whitefish, rd	Whitefish	Total
	Non FA	3				1	35		1				63				14		117
MR-1	FA	8					63		9				246				11	2	339
	Total	**11**				**1**	**98**		**10**				**309**				**25**	**2**	**456**
	Non FA	16				113	233		41				293				25	2	723
MR-2	FA	16	1			7	981		355				664		1		51	17	2,093
	Total	**32**	**1**			**120**	**1,214**		**396**				**957**		**1**		**76**	**19**	**2,816**
	Non FA	4			18	2	6		85		1	15	214	4			29		378
MR-5	FA	8	8	7	43		27		6	7	7	6	26	13		3	2	2	165
	Total	**12**	**8**	**7**	**61**	**2**	**33**		**91**	**7**	**8**	**21**	**240**	**17**		**3**	**31**	**2**	**543**
	Non FA	19	5	2	294	1	16		37			7	341	18	2	5	23		770
MR-6	FA	89	404	420	832	33	108		173	52	3,137	39	816	1,089		6	74	66	7,338
	Total	**108**	**409**	**422**	**1,126**	**34**	**124**		**210**	**52**	**3,137**	**46**	**1,157**	**1,107**	**2**	**11**	**97**	**66**	**8,108**
	Non FA	45	24	1	161	1	2		53	2	4	18	207	31	401	4	22		976
MR-7	FA	58	110	5	2,370	12	18		66	503	17	74	262	91	5,247	8	33	8	8,882
	Total	**103**	**134**	**6**	**2,531**	**13**	**20**		**119**	**505**	**21**	**92**	**469**	**122**	**5,648**	**12**	**55**	**8**	**9,858**
	Non FA	28	14	2	103		1		102			12	125	16	425		9		837
MR-8	FA	38	467	21	1,149	17	121	50	184	197	8	61	834	352	150		30	32	3,711
	Total	**66**	**481**	**23**	**1,252**	**17**	**122**	**50**	**286**	**197**	**8**	**73**	**959**	**368**	**575**		**39**	**32**	**4,548**
Grand Total		**332**	**1,033**	**458**	**4,970**	**187**	**1,611**	**50**	**1,112**	**761**	**3,174**	**232**	**4,091**	**1,614**	**6,226**	**26**	**323**	**129**	**26,329**

Preliminary data, may not contain all data sources, subject to QC

- Fish assemblage changes above Devils Canyon
- Highest catches in MR-5, MR-6, and MR-7

9.06 FDA ML – Fish Counts in FA macrohabitats

- Includes observation counts (snorkel)
- Fish assemblage changes above Devil's Canyon
- Tributaries and sloughs high numbers of juvenile salmon

	MR-1		MR-2						MR-5		MR-6										MR-7								MR-8					
Species	MC	SC	MC	SC	BW	CWP	SS	TM	MC	CWP	MC	SC	BW	CWP	SS	SSBC	TM	TRIB	US	USBC	MC	SC	BW	CWP	TM	TRIB	US	USBC	MC	SC	SS	TRIB	US	Total
Burbot	7	1		1	5	1	6	2	8		3	15	3			5				62	11	3	31			8	3	2	10	12	10	4	2	215
Chinook salmon					1				2	6	3	2	23	1	27	21	15	14	8	290		1	1	2		28	30	48		117	75	116	159	990
Chum salmon									7		2	8	29	20	1	66	71	185	38		4	1							1	16		4		453
Coho salmon									10	33		9	3	10	44	141	268	138	117	102	3	4	13	27	29	511	707	1,076		285	265	203	396	4,394
Dolly Varden			1		1		1	4									19	8	2	4	1				6	2	3		1	7	1	7	1	69
Grayling	29	34	13	58	54	169	656	31	22	5	3	4	16	25		2	39	14	5		4	1			1	11	1		4	8	30	78	1	1,318
Whitefish, hb										3		2	3	1									8											17
Lamprey, undiff																														3	46	1		50
Longnose sucker	1	8	6	16	33	1	299		2	4	7	44	11	7	15	17	2	1	11	58	13	40	8			2	2	1	9	88	77	7	3	793
Pacific salmon									1	6	2	6		3	6	14	10	2	3	6	9		4		1	63	122	304	2	30	117	3	45	759
Pink Salmon									4	3	12			43			101	2,981			17								5	1		2		3,169
Rainbow trout									1	5	4	1	2	5		1	4	18		4	2	1			5	60	4	2	6	3	11	37	4	180
Whitefish, rnd	5	6	6		19	11	15			2	6	32	3	7	6			2	6	12	9	2	19				3		4	21	3	2		201
Sculpin, undiff	127	119	84	166	11	20	280	103	25	1	121	175	14		39	167	86	147	64	3	55	72	2	8	14	72	38	1	45	294	412	53	31	2,849
Sockeye salmon										13		31	3	1	709	284	13	11	36	1	1	1	61			22	1	5		134	200	5	13	1,545
Stickleback							1																				359	4,888		22	14	8	106	5,398
Whitefish, undiff	2		1		1	5	10			1		56	3	5			1		1		1	3	4							18	14			126

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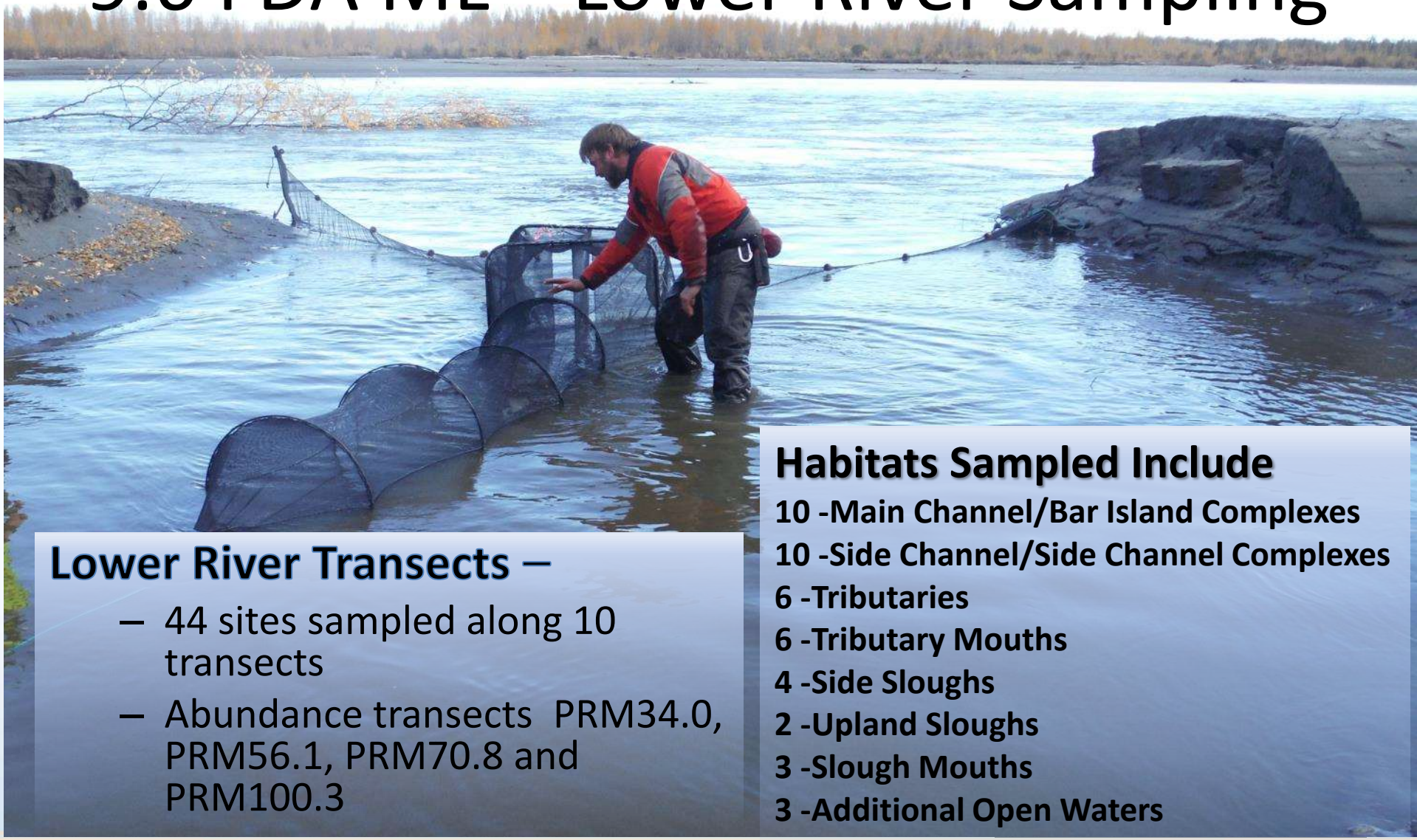
9.6 FDA ML – Lower River Sampling



Lower River Transects –

- 44 sites sampled along 10 transects
- Abundance transects PRM34.0, PRM56.1, PRM70.8 and PRM100.3

Habitats Sampled Include

10 -Main Channel/Bar Island Complexes
10 -Side Channel/Side Channel Complexes
6 -Tributaries
6 -Tributary Mouths
4 -Side Sloughs
2 -Upland Sloughs
3 -Slough Mouths
3 -Additional Open Waters

RSP 9.6 FDA ML – Fall Session

PRM 63.5 - 197 ½ Mile Creek

No. Species Captured by Session in LR				
Species	Early Summer	Late Summer	Fall	Grand Total
Salmon, UNID	11	22	25	58
Chum	7	41	250	298
Chinook	112	85	19	216
Coho	39	184	115	338
Pink	16	5	1	22
Sockeye	248	94	18	360
Rainbow Trout	40	8	2	50
Bering Cisco	-	-	2	2
Whitefish, Humpback	-	-	8	8
Whitefish, UNID	57	3	3	63
Whitefish, Round	10	50	36	96
Dolly Varden	1	4	1	6
Burbot	22	59	67	148
Arctic Grayling	7	5	24	36
Lamprey, Arctic	-	27	26	53
Lamprey, UNID	22	6	6	34
Longnose Sucker	338	363	383	1084
Northern Pike	20	25	2	47
Ninespined Stickleback	37	65	39	141
Threespined Stickleback	601	2617	696	3914
Sculpin, UNID	70	-	2	72
Sculpin, Slimy	100	264	240	604
Grand Total	1790	3932	1967	7689

** Preliminary data

** Preliminary data

Habitat Categories of the Lower River FDA sampling											
Species	Main Channel	Bar Island Complex	Side Channel	Side Channel Complex	Side Slough	Slough Mouth	Upland Slough	Additional Open Water	Tributary	Tributary Mouth	Grand Total
Salmon, UNID	11		5	3	3				35	1	58
Chum	2		6		19	159			58	54	298
Chinook	2		3	31	3	53	8	1	67	48	216
Coho	3		12		9	79	76	32	62	65	338
Pink	1		2	3		1			12	3	22
Sockeye	2	2	2	8	88	209	3	9	26	11	360
Rainbow Trout	1					4	27	1	16	1	50
Dolly Varden	2			2					2		6
Arctic Grayling	2		2	16	2	1			6	7	36
Bering Cisco				1	1						2
Humpback Whitefish			1		5			1	1		8
Whitefish, UNID	22			8	24	2		3		4	63
Round Whitefish	14	6	9	11		4		25	14	13	96
Burbot	19	3	20	19	28	20	11	1	6	21	148
Northern Pike					1				42	4	47
Lamprey, Artic	33		10	3	1	1			1	4	53
Lamprey, Unid				8	2	2			9	13	34
Longnose Sucker	172	76	44	148	164	327	41	39	13	60	1084
Sculpin, UNID		16		22		13	8		4	9	72
Sculpin, Slimy	65	98	52	124	16	35	6		106	102	604
Ninespined Stickleback				1		4	6	126	3	1	141
Threespined Stickleback			10	3	3	304	1633	1506	367	88	3914
Grand Total	351	201	178	411	369	1218	1819	1744	850	509	7650

RSP 9.6 FDA ML – LR Tributary Mouths

Gear Type Deployed (all sessions combined) at Tributary Mouth sites										
Project PRM	Tributary Name	Boat shocking	Hoop Trap	Baited minnow trap	Back Pack Electrofishing	Beach Seine	Snorkel	Drift Gill Net	Angling	Visual from Ground
100.3	Unnamed		♦	♦	♦	♦				♦
92.9	Birch		♦		♦	♦	♦		♦	♦
70.8	Sheep		♦	♦	♦		♦		♦	♦
63.5	197.5 Mile		♦	♦	♦	♦	♦		♦	♦
56.1	Little Willow		♦			♦		♦	♦	♦
34.0	Fish Creek	♦	♦	♦						♦

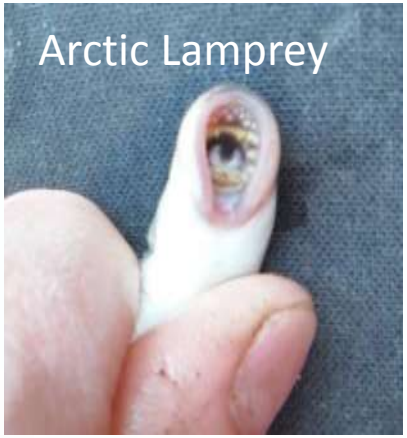
RSP 9.6 FDA ML – LR Tributary Mouths

Tributary Mouth Summary of Species by Capture Method

Species	Boat Shocking	Backpack Electrofishing	Hoop Trap	Baited Minnow Trap	Beach seining	Snorkelling	Angling	Visual observation from Ground	Grand Total
Chum			1		1	20		32	54
Chinook		13	8	3	23		1		48
Coho			6		6	50	1	2	65
Pink			1		1		1		3
Sockeye			1		9	1			11
Rainbow Trout					1				1
Whitefish, UNID		1	1		2				4
Whitefish, Round		1			12				13
Burbot	2		18	1					21
Arctic Grayling					4		3		7
Ninespined Stickleback			1						1
Threespined Stickleback		13	66	8	1				88
Lamprey, Arctic		1	3						4
Lamprey, UNID		10	1	2					13
Longnose Sucker	14	4	9	7	26				60
Northern Pike	4								4
Sculpin, UNID		2			7				9
Sculpin, Slimy		90	1	2	9				102
Grand Total	**20**	**135**	**117**	**23**	**102**	**71**	**6**	**34**	**508**

** Preliminary data

Fish in the Lower Susitna River



SUSITNA-WATANA HYDRO *Clean, reliable energy for the next 100 years.*

ALASKA ENERGY AUTHORITY

9.06 FDA ML – Q4 2013 Winter

- *Winter Studies*
  - *10 day sampling effort during freeze-up period: Nov 11-22*
  - *Approximately 30 off-channel sites sampled*
    - *FA 104, 128, 138, Whiskers Creek, 4th July Creek, Indian River*
    - *40-meter unit length*
    - *Minnow trapping, electrofishing, Fyke net, underwater video*

9.06 FDA ML – Variances

- *Middle/Lower River main channel and side channel sample length 500 meters for boat electrofishing and drift gillnets.*
- *Sample length for all other techniques 200 meters.*
- *Relative abundance was conducted using single pass electrofishing and snorkeling.*
- *Lengths on 25 fish per species per sample day.*

9.06 FDA ML – Next Steps

- ISR preparation, data QAQC, preliminary analysis
- Winter studies 2014
  - Bases of operation: FA-104, 128 and 138
  - E-fish, minnow trap, Fyke net , trot line, angling, underwater video, DIDSON, PIT array maintenance
  - Resample GRTS sites, identify 40-meters of 200 meters site for conditions appropriate for sampling
  - More GRTS sites added to FA 128 and 138: habitat n=3 per FA
  - Additional sampling at tributary and slough mouths
- Preparation for 2014 FDA studies, gear maintenance, procurement, staffing

9.05/06 FDA UP/ML – Outmigrant Traps

- *Operated 48 on/72 off during open water season*
- *High water event in mid-August suspended operation*
- *Fall leaf litter*

Location	Geo Reach	Install Date	Demob Date
Oshetna River TRM 0.1	UR-2	14-Jun	7-Oct
Kosina Creek TRM 2.2	UR-4	13-Jun	3-Oct
Indian River TRM 0.1	MR-6	9-Jun	12-Oct
Susitna PRM 124 (Curry Station)	MR-6	8-Jun	5-Sep
Susitna PRM 107 (TKA Station)	MR-8	10-Jun	25-Sep
Montana Creek TRM 2.1	LR-2	22-Jun	10-Oct

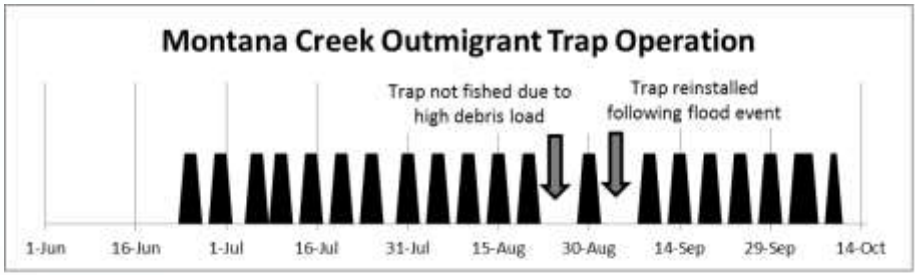
9.05 FDA UP – Outmigrant Traps

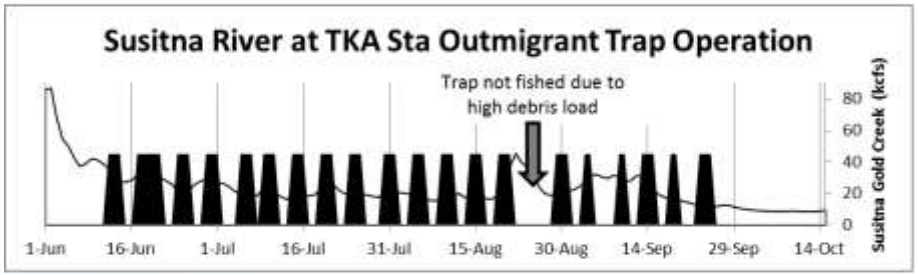
- *UR trap operation schedule*

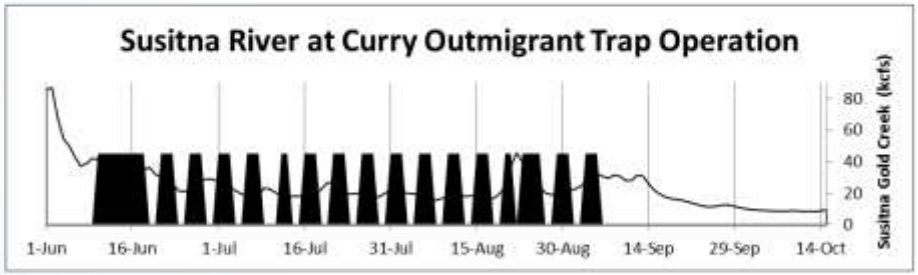
SUSITNA-WATANA HYDRO *Clean, reliable energy for the next 100 years.*

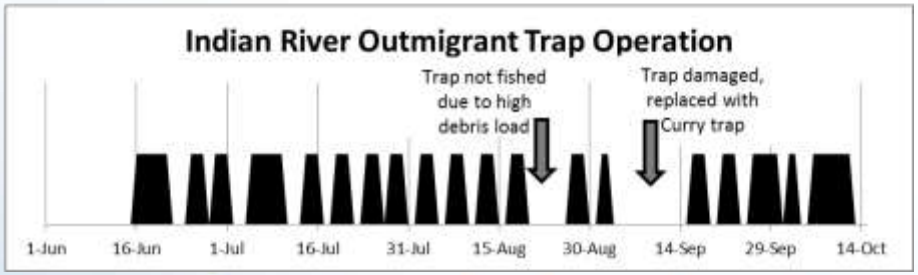
ALASKA ENERGY AUTHORITY

9.06 FDA ML – Outmigrant Traps









SUSITNA-WATANA HYDRO *Clean, reliable energy for the next 100 years.*

ALASKA ENERGY AUTHORITY

9.05/.06 FDA UP/ML – Outmigrant Traps

- *Demobilized in early October*
  - *UR traps stored on tundra for quick 2014 install*
  - *M/LR traps stored in Talkeetna & Gold Creek*
  - *Repairs made over winter*

9.05/06 FDAUP/ML – Outmigrant Trap Catch

- *15 species across all traps, UR Chinook at Oshetna and Kosina*
- *Low catch at Kosina Creek and Curry*
- *High catches at Indian, Montana, and Talkeetna*
- *Trap efficiency variable*

Location	Geo Reach	PRM	Coho salmon	Chinook salmon	Pink salmon	Grayling	Pacific salmonid, undiff	Chum salmon	Whitefish, undiff	Sculpin, undiff	Sockeye salmon	Longnose sucker	Round whitefish	Rainbow trout	Humpback whitefish	Dolly Varden	Burbot	Threespine stickleback	Salmonid, undiff	Lamprey, undiff	Total
Oshetna River	UR-2	234		1		687			43	72		185	81		10		4				1,083
Kosina Creek	UR-4	209.1		12		117			8	8		1	3		2	2					153
Indian River	MR-6	141	1,782	578	1,066	72	37	235	7	294	291	20	25	101	7	23	3		2		4,543
Susitna @ Curry	MR-6	124	191	32	190	70	31	46	159	14	20	41	18	8	15	3	7	2			847
Susitna @ TKA	MR-8	107	615	890	164	106	23	141	270	45	86	96	143	19	52	8	16	1	18	3	2,696
Montana Creek	LR-2	81	198	1,257	406	2	776	65		20		1	4	80		22		20		10	2,861
Total			2,786	2,770	1,826	1,054	867	487	487	453	397	344	274	208	86	58	30	23	20	13	12,183

Preliminary data

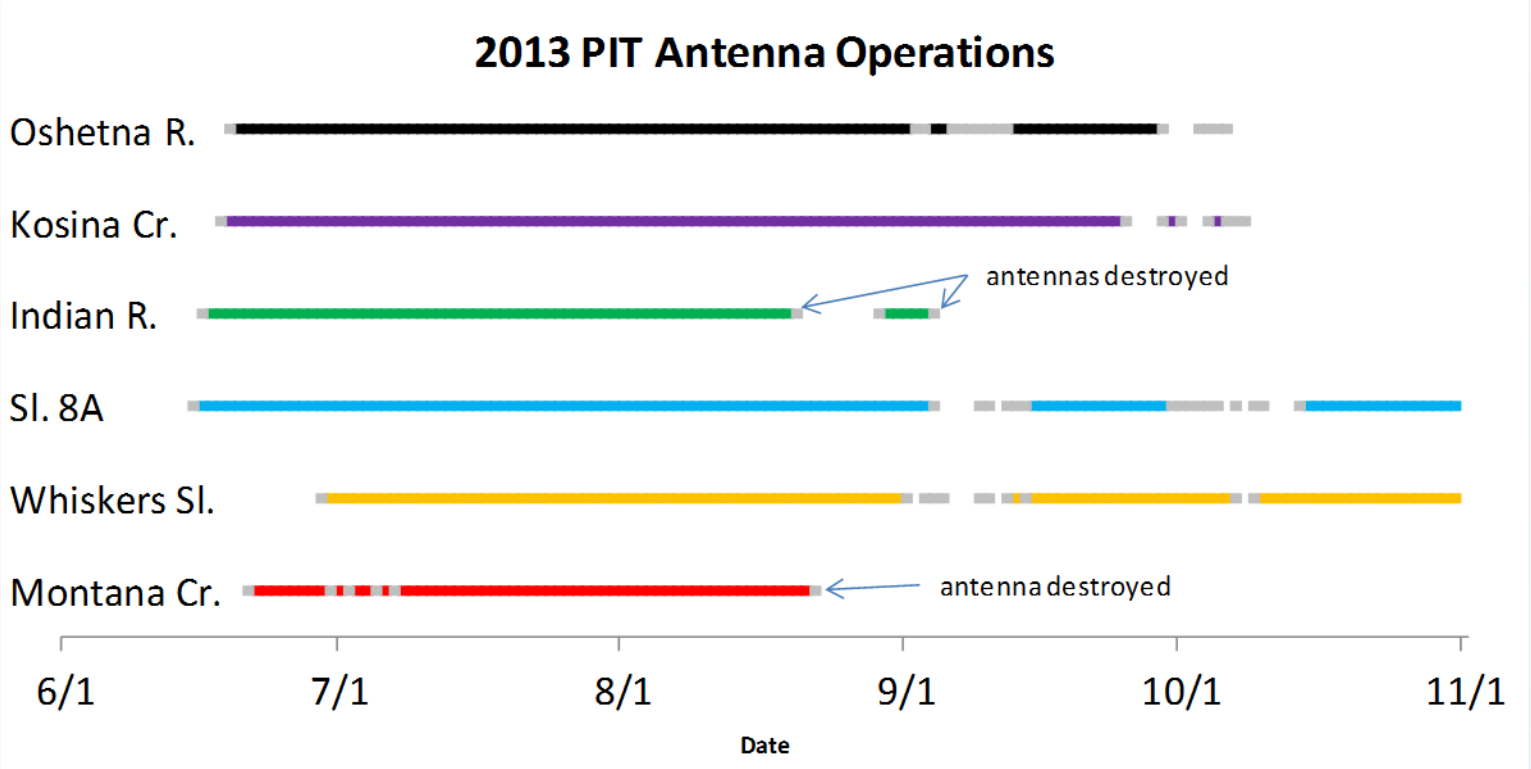
9.05/.06 FDA UP/ML – PIT Arrays

- *6 Locations paired with downstream migrant traps or intensive sampling*
- *Limitations on antenna length <20 meters single antenna*

Location	Geo Reach	Install Date	Demob Date
Oshetna River TRM 1.9	UR-2	19-Jun	7-Oct
Kosina Creek TRM 0.2	UR-4	18-Jun	9-Oct
Indian River TRM 0.2	MR-6	16-Jun	16-Sep
Slough 8A PRM 129.6	MR-6	15-Jun	na: Overwinter
Whiskers Slough PRM 105.1 ds of Whiskers Creek	MR-8	17-Jun	na: Overwinter
Montana Creek TRM 2.2	LR-2	21-Jun	na: Overwinter

9.05/.06 FDA UP/ML – PIT Arrays

- High flow events have resulted in antennas being rebuilt
- Partial outages due to power supply



9.05 RST Variance

- No RST was deployed near the dam site due to denied access to ANCSA lands on both sides of the river.

9.05/.06 FDA UP/ML – PIT Tagging

- *Downstream migrant traps and FDA broadcast sampling primary sources of fish*

Species	Geomorphic Reach									Total
	UR-2 & 3	UR-4 & 5	MR-1	MR-2	MR-5	MR-6	MR-7	MR-8	LR-2	
Burbot	14	16		15		75	50	37		**207**
Dolly Varden		21	1	4		22	1	10	7	**66**
Grayling	569	177	12	159	5	114	1	86	2	**1,125**
Longnose sucker*		6		1		3	3	3		**16**
Chinook salmon	6	16		1	3	561	76	595	397	**1,655**
Chum salmon						12			1	**13**
Coho salmon						1,072	437	428	147	**2,084**
Pacific salmon						2	3	4	45	**54**
Sockeye salmon						47	13	25		**85**
Rainbow trout					5	111	38	60	74	**288**
Humpback whitefish	7				1	26	8	45		**87**
Round whitefish	74	21	13	38	22	92	22	103	1	**386**
Whitefish, undiff				1		49		101		**151**
	670	**257**	**26**	**219**	**36**	**2,186**	**652**	**1,497**	**674**	**6,217**

preliminary data, does not contain all data sources

**not a target species*

9.05/.06 Radio Tagging – Q4 2013 Highlights

Lower, Middle & Upper River

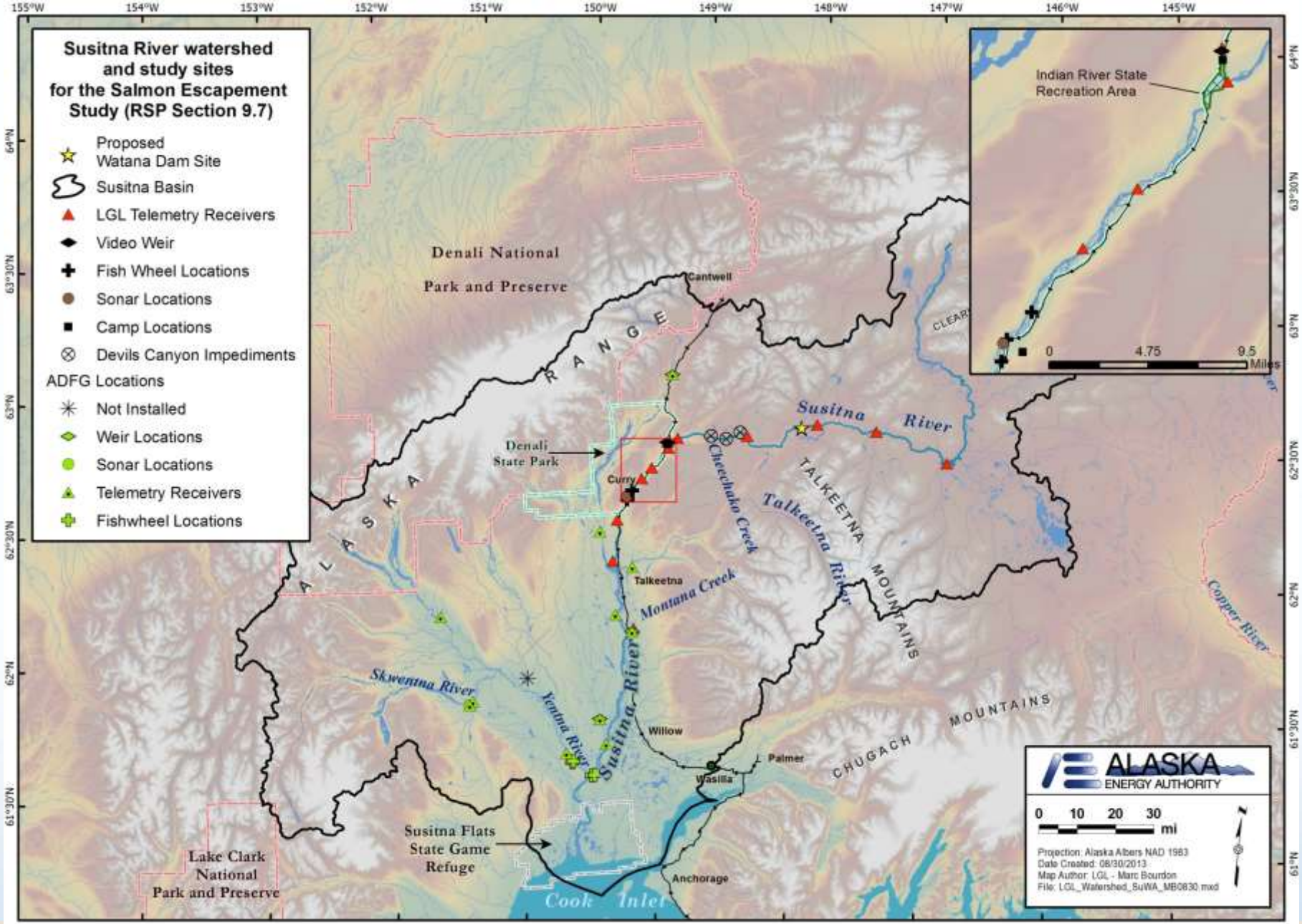
Total number of resident fish (Lower + Middle + Upper)

- Burbot – 16
- Dolly Varden – 9
- Arctic Grayling – 92
- Humpback Whitefish – 7
- Lake Trout – 0
- Longnose Sucker – 38
- Northern Pike – 5
- Rainbow Trout – 44
- Round Whitefish – 39
- No taggable DV, HW, LT, NP, RT in the Upper River

RSP 9.7 Salmon Escapement – Q4 2013 Study Highlights

Lower, Middle & Upper River

- Demobilization of fishwheel and sonar operations near Curry
- Demobilization of some fixed telemetry sites
- Data processing and analysis
- Prepare Initial Study Report (ISR)
- Aerial telemetry surveys for coho
- Demobilization of Montana Creek and Deshka River weirs
- Demobilization of ADF&G field camps at Chulitna, Deshka, Montana, Talachulitna, and Lower Susitna


Susitna River watershed and study sites for the Salmon Escapement Study (RSP Section 9.7)
Proposed Watana Dam Site
Susitna Basin
LGL Telemetry Receivers
Video Weir
Fish Wheel Locations
Sonar Locations
Camp Locations
Devils Canyon Impediments
ADFG Locations
Not Installed
Weir Locations
Sonar Locations
Telemetry Receivers
Fishwheel Locations
Indian River State Recreation Area
0 4.75 9.5 Miles
Denali National Park and Preserve
ALASKA RANGE
Cantwell
Susitna River
Denali State Park
Curry
Cheechako Creek
TALKEETNA MOUNTAINS
Talkeetna River
Talkeetna
Montana Creek
Skwentna River
Yentna River
Susitna River
Willow
Palmer
Wasilla
CHUGACH MOUNTAINS
Copper River
Susitna Flats State Game Refuge
Lake Clark National Park and Preserve
Anchorage
Cook Inlet
ALASKA ENERGY AUTHORITY
0 10 20 30 mi
Projection: Alaska Albers NAD 1983
Date Created: 08/30/2013
Map Author: LGL - Marc Bourdon
File: LGL_Watershed_SuWA_MB0830.mxd

RSP 9.7 Salmon Escapement

Susitna River RM 30 effort and catch through 8/31

- operated 6/3 to 8/31
- ~12 hours/day/fishwheel of effort
- gill net fished only as long as necessary
- Radio tags applied to salmon at RM 30
  - 689 Chinook total
    - 578 Chinook via fish wheels
    - 111 Chinook via gill net
  - 200 pink via fish wheels
  - 596 coho via fish wheels

RSP 9.7 Salmon Escapement

LOWER RIVER

<u>Yentna River effort and catches through 6/30</u>

- operated 6/2 to 6/30
- ~12 hours/day/fishwheel of effort
- gill net fished only as long as necessary
- Radio tags applied to salmon
  - 692 Chinook total
    - 425 Chinook via fish wheels
    - 267 Chinook via gill net

RSP 9.7 Salmon Escapement

LOWER RIVER

Preliminary summary of catch at Susitna River RM 30 through 8/31

Species	Total Catch
FISH WHEEL	
Chinook (all sizes)	1,882
Sockeye Salmon	624
Pink Salmon	34,093
Chum Salmon	3,273
Coho Salmon	3,278
Other species	249
GILL NET	
Chinook (all sizes)	167

NC=not collected

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RSP 9.7 Salmon Escapement

Lower River

Preliminary summary of catches at the Yentna River through 8/26

Species	Total Catch
FISH WHEEL	
Chinook (all sizes)	2,008
Sockeye Salmon	NC
Pink Salmon	NC
Chum Salmon	NC
Coho Salmon	NC
Other species	NC
GILL NET	
Chinook (all sizes)	310

NC=not collected

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RSP 9.7 Salmon Escapement

Montana Creek Weir

To establish mark rates from RM 30 tagging

- Operated June 17 – Sep 9
- Weir topped August 21-25
- 2,015 Chinook counted
- 765 coho counted
- Radio-tagged fish detected from fixed and aerial telemetry

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RSP 9.7 Salmon Escapement

Deshka River Weir

To establish mark rates from RM 30 tagging

- Operated June 9 – Sep 3
- 18,531 Chinook counted
- 22,141 coho counted
- Radio-tagged fish detected from fixed and aerial telemetry

RSP 9.7 Salmon Escapement

Chulitna River

To establish mark rates from RM 30 tagging

- Operated June 20 – August 2
- Sonar used instead of weir due to water depth & velocity
- Fish counts in progress
- Radio-tagged fish detected from fixed and aerial telemetry

RSP 9.7 Salmon Escapement

Talachulitna River

LOWER RIVER

To establish mark rates from Yentna tagging

- Operated June 8 – July 31
- Sonar used instead of weir due to water depth & velocity
- Fish counts in progress
- Radio-tagged fish detected from fixed and aerial telemetry

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RSP 9.7 Salmon Escapement

Variances

- Sonar, not weir, at Talachulitna River
  - Water depth & velocity too great for weir
  - Sonar used instead, obtained from Lake Creek site
- No weir or sonar at Lake Creek
  - Water depth & velocity too great for weir
  - No direct access to site
  - Sonar unit re-assigned to Chulitna River, a higher priority area

RSP 9.7 Salmon Escapement

Recommendations 2014

Lower River

- Discontinue Talachulitna and Lake Creek weir/ARIS sonar
- Fishwheel to Fishwheel M/R for Chinook salmon on Yentna drainage (precision will likely be low)
- Maximize dart-tagging and fishwheel effort for Chinook on Yentna drainage.
- Eliminate spawning distribution of Chinook on Yentna drainage.
- Use ARIS sonar on Chulitna rather than a weir since water levels are too high.

RSP 9.7 Salmon Escapement

Curry effort and catch through 9/30

- 2,900 hours of fishwheel effort, ~12+ hrs/day/fw
- Radio tags applied to salmon at Curry
  - 603 Chinook
    - 536 (≥ 50 cm MEF) and 67 (< 50 cm MEF)
  - 200 pink
  - 201 chum
  - 139 sockeye
  - 231 coho

RSP 9.7 Salmon Escapement

Middle River

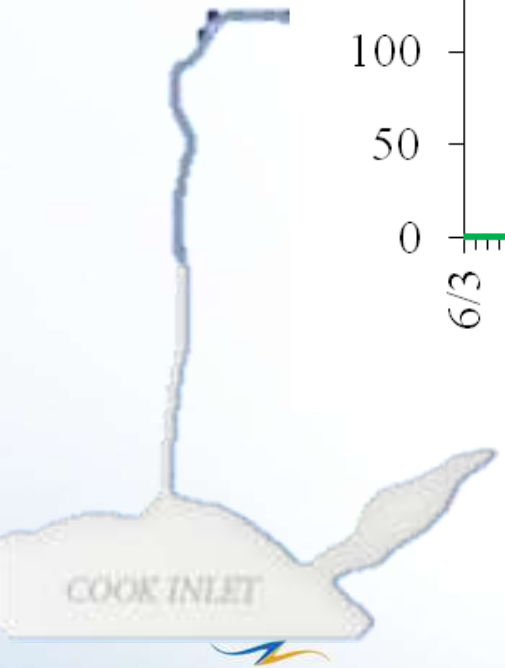
Preliminary catch summary at fishwheels through 9/30

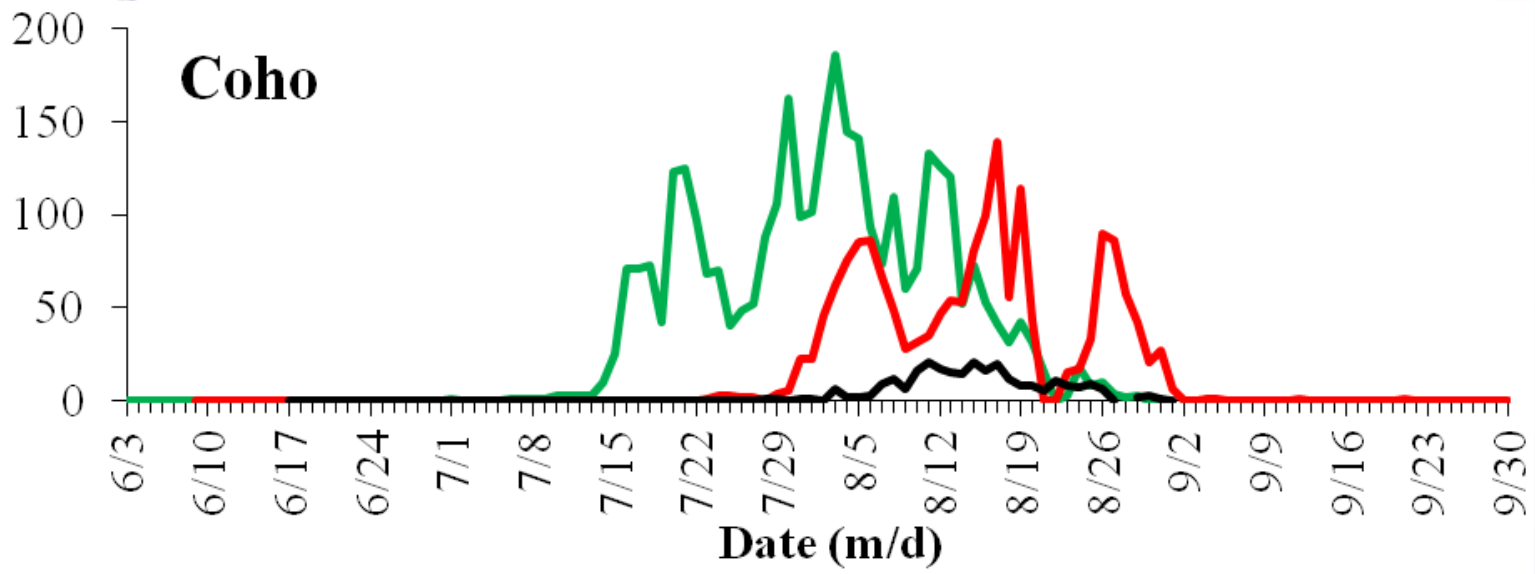
Species	Total Catch	MEF/FL (cm) Min	Max	Avg	n	Biosamples DNA	Scales
Chinook (?50cm MEF)	616	50	110	70	576	542	283
Chinook (<50cm MEF)	336	23	49	36	320	67	33
Chum Salmon	3,417	27	70	59	1,358	201	2
Coho Salmon	1,734	31	67	51	1,030	220	123
Pink Salmon	15,695	31	61	42	1,696	199	0
Sockeye Salmon	276	24	64	45	261	138	86
Arctic Grayling	54	20	40	34	51	40	0
Burbot	2	41	45	43	2	1	0
Dolly Varden	14	19	43	29	14	11	0
Longnose Sucker	20	20	39	29	20	5	0
Rainbow Trout	59	15	46	32	52	33	0
Round Whitefish	104	14	42	27	102	56	0
Humpback Whitefish	20	24	38	29	17	11	0

RSP 9.7 Salmon Escapement

Catch at fishwheels through 9/30

MIDDLE RIVER





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RSP 9.7 Salmon Escapement

Variances

- Nothing different to report since Q3
  - Apply additional tags to Chinook (600+ applied vs. 400 proposed). RSP 9.7.4.1
  - No tagging and fixed stations at Devils Canyon. RSP 9.7.4.1 and 9.7.4.2.1
  - ARIS sonar used for turbid water spawning in place of combined DIDSON and Side-scan sonar. RSP 9.7.4.4.1
  - Operated a weir on Indian River to obtain mark-rate information on Chinook and other species (instead of spawning ground surveys). RSP 9.7.4.1.3 and 9.7.4.1.5

RSP 9.7 Salmon Escapement

Recommendations 2014

MIDDLE RIVER

- Fishwheels
- Indian Weir
- Radio-telemetry
- Turbid Waters Sonar
- Watana Sonar

RSP 9.7 Salmon Escapement

Recommendations - Curry Fishwheels

Middle River

To capture and radio-tag all species of salmon

- 650 Chinook (variance). RSP 9.7.4.1
- 200 pink, chum, sockeye, coho
- Spaghetti tag proportion of fish over telemetry goals
- Use sonar as secondary run monitoring in June and September (variance). RSP 9.7.4.1.7
- No tagging at Devils Canyon (variance). RSP 9.7.4.1
- Operate through 31 August, then switch to seining (variance from FERC recommendation)

RSP 9.7 Salmon Escapement

Recommendations - Indian River Weir

To establish mark rates from LR and MR river fishwheels

- Enumerate the number of radio-tagged salmon
- Enumerate all species of salmon, as feasible (variance). RSP 9.7.4.1.3 and 9.7.4.1.5
- Enumerate the number of spaghetti-tagged salmon (variance). RSP 9.7.4.1.3

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RSP 9.7 Salmon Escapement

Recommendations - Telemetry

MIDDLE & UPPER RIVER

To determine the timing, distribution and habitat use of all species of salmon

Monitoring

- 11 fixed stations. Locations dependent on land access (variance). RSP 9.7.4.2.1
- Conduct daily aerial surveys of Devils Canyon during Chinook migration, if no land access (variance). RSP 9.7.4.2.2

COOK INLET

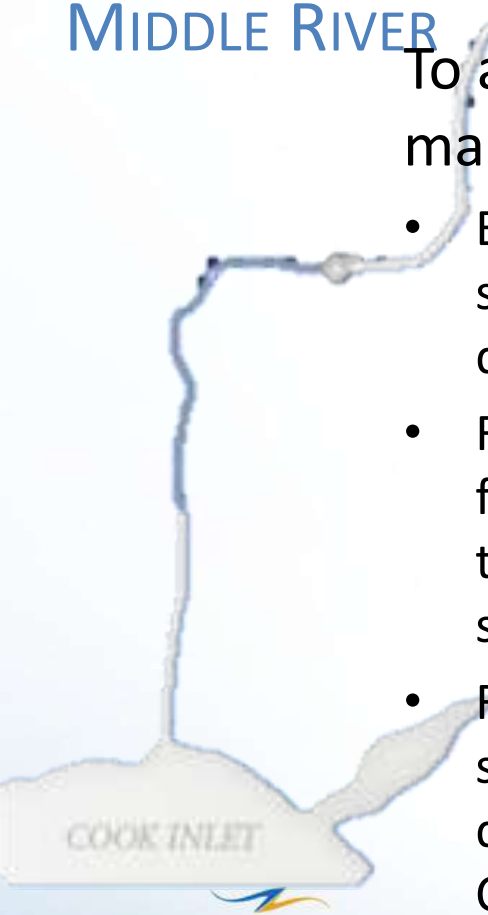
RSP 9.7 Salmon Escapement

Recommendations – Sonar Surveys

MIDDLE RIVER

To assess Chinook spawning in mainstem habitats

- Existing data has observations of spawning behavior (guarding), but no digging or distinct redds
- Repeat procedures used in 2013, but focus intense effort 4th week July through 1st week August in main and side channels (variance). RSP 9.7.4.4.1
- Requires aerial telemetry survey support to be conducted every two days from 5th July Creek to Portage Creek



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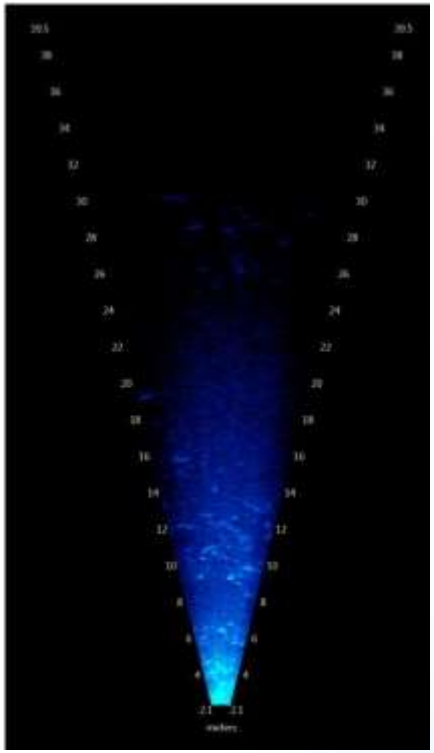
RSP 9.7 Salmon Escapement

Recommendations - Sonar at Watana

To Enumerate Chinook moving past the dam site

- Operate approximately 7 Jul – 7 August
- Quantify the accuracy of sonar counts using the passage of radio-tagged fish
- Provide minimal count of Chinook above dam site
- Ignore resident fish in the sonar study (variance from FERC recommendation)



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RSP 9.8 River Productivity Study

4th Quarter 2013 Activities:

- Fall seasonal collection event
  - September 22 to October 3
- Emergence trap sampling concluded
- Colonization study sampler deployment, retrieval
  - H-D samplers at 4 sites in FA-104
- Literature Review Paper Completed
  - Review of impacts of hydropower on benthic macroinvertebrates and algal communities

RSP 9.8 River Productivity Study

Fall Seasonal Sampling Event

- Revisited and sampled 20 sites in five study areas, plus 3 "reference" sites on the Talkeetna River

Date Sampled	Name	Focus Area	Sites	Macrohabitats
10/1, 10/3	Montana Creek	RP-81	4	MC, SC, US, TM
9/28 – 9/30	Whiskers Creek	FA-104	5	MC, SC, SS, US, TM
9/25 – 9/26	Indian River	FA-141	4	MC, SC, US, TM
9/23 – 9/24	Stephan Lake Complex	FA-173	4	MC, SC, SS, TM
9/22	Watana Dam	FA-184	3	MC, SC, TM
9/30, 10/2	Talkeetna River	TKA	3	SC, SS, US

RSP 9.8 River Productivity Study

Fall Seasonal Sampling Event

- Approximately 479 samples collected
  - 92 Hess samples
  - 115 Chl-a samples
  - 115 AFDM samples
  - 55 LWD (snag) samples
  - 32 Drift samples
  - 30 Grab samples
  - 40 Plankton Tows

RSP 9.8 River Productivity Study

Station	Site	Macrohabitat Type	Total Number of Samples Collected in 2013					
			Hess	Grab	Algae	Drift	Plankton Tow	Snag
RP- 81 (Montana Creek)	RP-81-1	US	5	10	15	2	10	12
	RP-81-2	TM	15		15	6		15
	RP-81-3	MC	15		15	6		4
	RP-81-4	SC	15		15	6		15
	RP-81-5*	SC				6		
FA-104 (Whiskers Slough)	RP-104-1	SS	15		15	6		12
	RP-104-2	SS	17	5	20	2	15	18
	RP-104-3	MC	15		15	6		0
	RP-104-4	US		15	15	2	15	13
	RP-104-5	SC	15		15	2	5	7
FA-141 (Indian River)	RP-141-1	TM	15		15	6		13
	RP-141-2	SC	10	5	15	2	5	6
	RP-141-3	MC	15		15	6		0
	RP-141-4	US	12	15	15		15	12
	RP-141-5*	MC				2		
FA-173 (Stephan Lake Complex)	RP-173-1	TM	15		15	6		6
	RP-173-2	MC	15		15	6		0
	RP-173-3	SC	15		15	2	5	3
	RP-173-4	SS	17	20	20		15	8
FA-184 (Watana Dam Site)	RP-184-1	TM	15		14	6		10
	RP-184-2	SC	15		15	6		1
	RP-184-3	MC	15		15	6		0
		Grand Total	**271**	**70**	**309**	**92**	**85**	**155**

* sites added for drift sample comparison upstream of TMs

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RSP 9.8 River Productivity Study

2013 Macroinvertebrate and Algae Samples

- Replicate sample totals by macrohabitat type

Macrohabitat Type	Number of Sites	Hess	Grab	Algae	Drift	Plankton Tow	Snag
Main Channel	5	75		75	32		4
Side Channel	5	70	5	75	24	15	32
Side Slough	3	49	25	55	8	30	38
Upland Slough	3	17	40	45	4	40	37
Tributary Mouth	4	60		59	24		44
		271	**70**	**309**	**92**	**85**	**155**

RSP 9.8 River Productivity Study

2013 Macroinvertebrate and Algae Samples

- Talkeetna Reference Station Sites

Station	Site	Macrohabitat Type	Total Number of Samples Collected in 2013				
			Hess	Grab	Algae	Drift	Plankton Tow
Talkeetna Station	RP-TKA-1	SC	15		15	6	
	RP-TKA-2	US		15	15		10
	RP-TKA-3	SS	15		15	6	
		Grand Total	**30**	**15**	**45**	**12**	**10**

RSP 9.8 River Productivity Study

Stable Isotope Samples

Category	Taxon	TOTALS			
		Spring	Summer	Fall	2013
Endmembers	Algae	45	48	48	**141**
	Organic matter - benthic	45	48	48	**141**
	Organic matter - seston	30	32	32	**94**
	Salmon carcasses	0	8	6	**14**
Invertebrates	Benthic - collectors	48	48	N/A	**96**
	Benthic -grazers	34	33	N/A	**67**
	Benthic - shredders	30	48	N/A	**78**
	Benthic - predators	48	48	N/A	**96**
	Terrestrial	27	36	N/A	**63**
	Emergents	*N/A*	*N/A*	N/A	***N/A***
Fish	Chinook salmon - juveniles	36	46	21	**103**
	Coho salmon - juveniles	25	47	46	**118**
	Rainbow trout - juveniles	9	0	0	**9**
	Rainbow trout - adults	4	17	10	**31**
		381	**459**	**211**	**1051**

N/A: sample types not fully processed and enumerated as of October 31, 2013.

RSP 9.8 River Productivity Study

Spring Fish Sampling – Gut contents, scales, and fin clips

Station	Sampling site	Habitat Type	Juvenile Chinook	Juvenile Coho	Juvenile Rainbow	Adult Rainbow
RP- 81 (Montana Creek	RP-81-1	Upland Slough	8	8	0	0
	RP-81-2	Tributary Mouth	12	9	9	0
	RP-81-3	Main Channel	-	-	-	-
	RP-81-4	Side Channel	0	0	0	0
FA-104 (Whiskers Slough)	RP-104-1	Side Slough	8	0	0	3
	RP-104-2	Side Slough	-	-	-	-
	RP-104-3	Main Channel	-	-	-	-
	RP-104-4	Upland Slough	-	-	-	-
	RP-104-5	Side Channel	-	-	-	-
FA-141 (Indian River)	RP-141-1	Tributary Mouth	8	8	0	1
	RP-141-2	Side Channel	-	-	-	-
	RP-141-3	Main Channel	-	-	-	-
	RP-141-4	Upland Slough	-	-	-	-
FA-173 (Stephan Lake Complex)	RP-173-1	Tributary Mouth	0	0	0	0
	RP-173-2	Main Channel	-	-	-	-
	RP-173-3	Side Channel	0	0	0	0
	RP-173-4	Side Slough	0	0	0	0
FA-184 (Watana Dam Site)	RP-184-1	Tributary Mouth	0	0	0	0
	RP-184-2	Side Channel	0	0	0	0
	RP-184-3	Main Channel	-	-	-	-
	Spring Totals		**36**	**25**	**9**	**4**

Zeros indicate that a site was sampled, but no fish of a given species and size class were captured. Hyphens indicate that a site was not sampled.

RSP 9.8 River Productivity Study

Summer Fish Sampling – Gut contents, scales, and fin clips

Station	Sampling site	Habitat Type	Juvenile Chinook	Juvenile Coho	Juvenile Rainbow	Adult Rainbow
RP- 81 (Montana Creek	RP-81-1	Upland Slough	0	0	0	0
	RP-81-2	Tributary Mouth	1	4	0	0
	RP-81-3	Main Channel	-	-	-	-
	RP-81-4	Side Channel	0	0	0	0
FA-104 (Whiskers Slough)	RP-104-1	Side Slough	8	8	0	0
	RP-104-2	Side Slough	8	8	0	9
	RP-104-3	Main Channel	-	-	-	-
	RP-104-4	Upland Slough	8	8	0	0
	RP-104-5*	Side Channel	8	8	0	0
FA-141 (Indian River)	RP-141-1	Tributary Mouth	5	8	0	8
	RP-141-2	Side Channel	-	-	-	-
	RP-141-3	Main Channel	-	-	-	-
	RP-141-4*	Upland Slough	8	3	0	0
FA-173 (Stephan Lake Complex)	RP-173-1	Tributary Mouth	0	0	0	0
	RP-173-2	Main Channel	-	-	-	-
	RP-173-3	Side Channel	0	0	0	0
	RP-173-4	Side Slough	0	0	0	0
FA-184 (Watana Dam Site)	RP-184-1	Tributary Mouth	0	0	0	0
	RP-184-2	Side Channel	0	0	0	0
	RP-184-3	Main Channel	-	-	-	-
	SummerTotals		**46**	**47**	**0**	**17**

Zeros indicate that a site was sampled, but no fish of a given species and size class were captured. Hyphens indicate that a site was not sampled.

* Sampling by the FDA study team covered the same macrohabitat types but different sites

RSP 9.8 River Productivity Study

Fall Fish Sampling – Gut contents, scales, and fin clips

Station	Sampling site	Habitat Type	Juvenile Chinook	Juvenile Coho	Juvenile Rainbow	Adult Rainbow
RP- 81 (Montana Creek	RP-81-1	Upland Slough	1	4	0	0
	RP-81-2	Tributary Mouth	0	2	0	0
	RP-81-3	Main Channel	0	0	0	0
	RP-81-4	Side Channel	0	0	0	0
FA-104 (Whiskers Slough)	RP-104-1	Side Slough	8	8	0	8
	RP-104-2	Side Slough	2	8	0	0
	RP-104-3	Main Channel	0	0	0	0
	RP-104-4	Upland Slough	1	6	0	0
	RP-104-5*	Side Channel	3	9	0	0
FA-141 (Indian River)	RP-141-1	Tributary Mouth	6	8	0	2
	RP-141-2	Side Channel	0	0	0	0
	RP-141-3	Main Channel	0	0	0	0
	RP-141-4	Upland Slough	0	1	0	0
FA-173 (Stephan Lake Complex)	RP-173-1	Tributary Mouth	0	0	0	0
	RP-173-2	Main Channel	0	0	0	0
	RP-173-3	Side Channel	0	0	0	0
	RP-173-4	Side Slough	0	0	0	0
FA-184 (Watana Dam Site)	RP-184-1	Tributary Mouth	0	0	0	0
	RP-184-2	Side Channel	0	0	0	0
	RP-184-3	Main Channel	0	0	0	0
	Fall Totals		**21**	**46**	**0**	**10**

Zeros indicate that a site was sampled, but no fish of a given species and size class were captured. Hyphens indicate that a site was not sampled.

* Sampling by the FDA study team covered the same macrohabitat types but different sites

RSP 9.8 River Productivity Study

Emergence Trap Sampling

- Traps maintained at 19 sampling sites during 2013
- Last collection of all traps in conjunction with last site visits
- Total number of site visits for 2013: 64
- Total number of samples for 2013: 45
- Total lost samples: 19

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RSP 9.8 River Productivity Study

Emergence Trap Sampling

Station	Site	Install Date	Removal Date	Number of Collection Visits	Number of Samples Collected
RP- 81 (Montana Creek	RP-81-1 (US)	7/1/2013	10/1/2013	4	3
	RP-81-2 (TM)	6/30/2013	10/1/2013	4	1
	RP-81-3 (MC)	6/29/2013	10/3/2013	4	4
	RP-81-4 (SC)	6/30/2013	10/3/2013	4	3
FA-104 (Whiskers Slough)	RP-104-1 (SS)	6/23/2013	9/27/2013	4	4
	RP-104-2 (SS)	6/19/2013	9/27/2013	4	3
	RP-104-3 (MC)	6/21/2013	9/30/2013	4	4
	RP-104-4 (US)	6/23/2013	9/28/2013	4	4
	RP-104-5 (SC)	6/21/2013	9/28/2013	4	2
FA-141 (Indian River)	RP-141-1 (TM)	6/25/2013	9/25/2013	3	1
	RP-141-2 (SC)	6/25/2013	9/26/2013	3	2
	RP-141-3 (MC)	6/27/2013	9/25/2013	3	1
	RP-141-4 (US)	6/27/2013	9/26/2013	3	1
FA-173 (Stephan Lake Complex)	RP-173-1 (TM)	7/11/2013	9/23/2013	3	2
	RP-173-2 (MC)	7/29/2013	9/23/2013	2	2
	RP-173-3 (SC)	7/11/2013	9/23/2013	2	1
	RP-173-4 (SS)	7/10/2013	9/24/2013	3	2
FA-184 (Watana Dam Site)	RP-184-1 (TM)	7/13/2013	9/22/2013	3	2
	RP-184-3 (MC)	7/12/2013	9/22/2013	3	3
			Totals for 2013	**64**	**45**

RSP 9.8 River Productivity Study

Colonization Sampling Task

- Four locations established in FA-104 representing different turbidity and temperature conditions
  - Clear vs. Turbid, Warm (ca. 13°C) vs. Cold (< 13°C)

Conditions	Site	8-Wk		6-Wk		4-Wk		2-Wk		1-Wk	
		Shallow	Deep	Shallow	Deep	Shallow	Deep	Shallow	Deep	Shallow	Deep
Clear, Warm	RP-HD-1	3	3	2	3	3	3	3	3	3	3
Clear, Cold	RP-HD-2	3	3	3	3	3	3	3	3	3	3
Turbid, Cold	RP-HD-3	3	3	3	3	3	3	3	3	-	-
Turbid, Warm	RP-HD-4	3	3	3	3	3	3	3	3	-	-

Red numbers indicate sampling sets that were exposed during deployment for a short period.

RSP 9.8 River Productivity Study

Colonization Sampling Task

- Sept 20 site visit (1 week set deployment)
  - Main channel sites were exposed and buried in silt (turbid and cool site) or nearing exposure (turbid and warm site)
  - All main channel samples retrieved to avoid further losses
  - No final 1-week exposure set deployed at those sites
    - Weeks 7, 5, 3, and 1 retrieved, many exposed within the last week
  - Installed 1-week sets at sites located in the slough
    - Clear and warm (below trib mouth), clear and cool (in slough).
- Final retrieval of clear sets on Sept 28 – 29

RSP 9.8 River Productivity Study

2013 Sampling Season

- Sampling totals
  - 1094 benthic macroinvertebrate and algae samples (Hess, grab, snag, drift, plankton tows, algae)
  - 1051 (to date) Stable Isotope samples
  - 45 Emergence trap samples
  - 105 Hester-Dendy samples
  - 261 Fish stomach content samples
- Total collected in 2013 = 2556

RSP 9.8 River Productivity Study

Variances:

- Stable Isotope site selection was increased from the original two stations (3 sites each) to four stations, sampling 16 sites
  - Sampling at FA-184 (Watana Dam site), FA-141 (Indian River), FA-104 Whiskers Slough), and RP-81 (Montana Creek).
  - Sampling now at 4 main channel, 4 side channel, 3 tributary mouths, 3 upland sloughs, and 2 side sloughs.
  - This expanded approach allowed the study to sample a wider variety of locations and macrohabitats, with varying levels of MDN inputs, which will better our understanding of the influence of the various energy sources to river food web.

RSP 9.8 River Productivity Study

Variances (presented for Q3):

- Frequent and rapid river stage changes limited sampling opportunities available for 30-day periods with continuous inundation.
- Number of depth and velocity measures reduced for each Hess sample.
- Lower River site was moved from Trapper Creek to Montana Creek.
- Sampling prevented at the FA- 173 upland slough, replaced by small unnamed tributary mouth.
- Storm Event Sampling taken at side slough at FA-173 instead of FA-144; upper and lower end sites not established.
- Dry weights for macroinvertebrate taxa will be estimated using length-weight relationship data from UAF Wipli Lab.
- Algae samples were taken from stones and woody debris as opposed to fine sediment in grab samples.
- Plankton tows were conducted at 5 still water sites instead the potential total of 11 recommended by FERC.

RSP 9.8 River Productivity Study

Additional Variances:

- Hester-Dendy Samplers were not pre-conditioned before deployment (IP 2.9.1)
  - Results from the colonization periods of shorter duration may be underestimated in comparison to natural substrates
  - All Hester-Dendy samplers subject to same base colonization conditions, differing only in the factors of temperature, turbidity, depth, and velocity that would affect colonization rates

RSP 9.8 River Productivity Study

Literature Review Paper

- ***Synthesize existing information on the impacts of hydropower development and operations (including temperature and turbidity) on benthic macroinvertebrate and algal communities***
  - Summarize relevant literature on macroinvertebrate and algal community information in Alaska, including 1980s Susitna River data
  - Review and summarize literature on general influences of changes in flow, temperature, substrates, nutrients, organic matter, turbidity, light penetration, and riparian habitat on benthic communities
  - Review and summarize the potential effects of dams and hydropower operations, including flushing flows and load-following, on benthic communities and their habitats

RSP 9.8 River Productivity Study

1st Quarter 2014 Activities:

- Complete ISR
- Continue to receive lab results and analyze data from 2013
- Analyze results to determine additional needs for 2014 sampling season
- Integrate data into trophic model

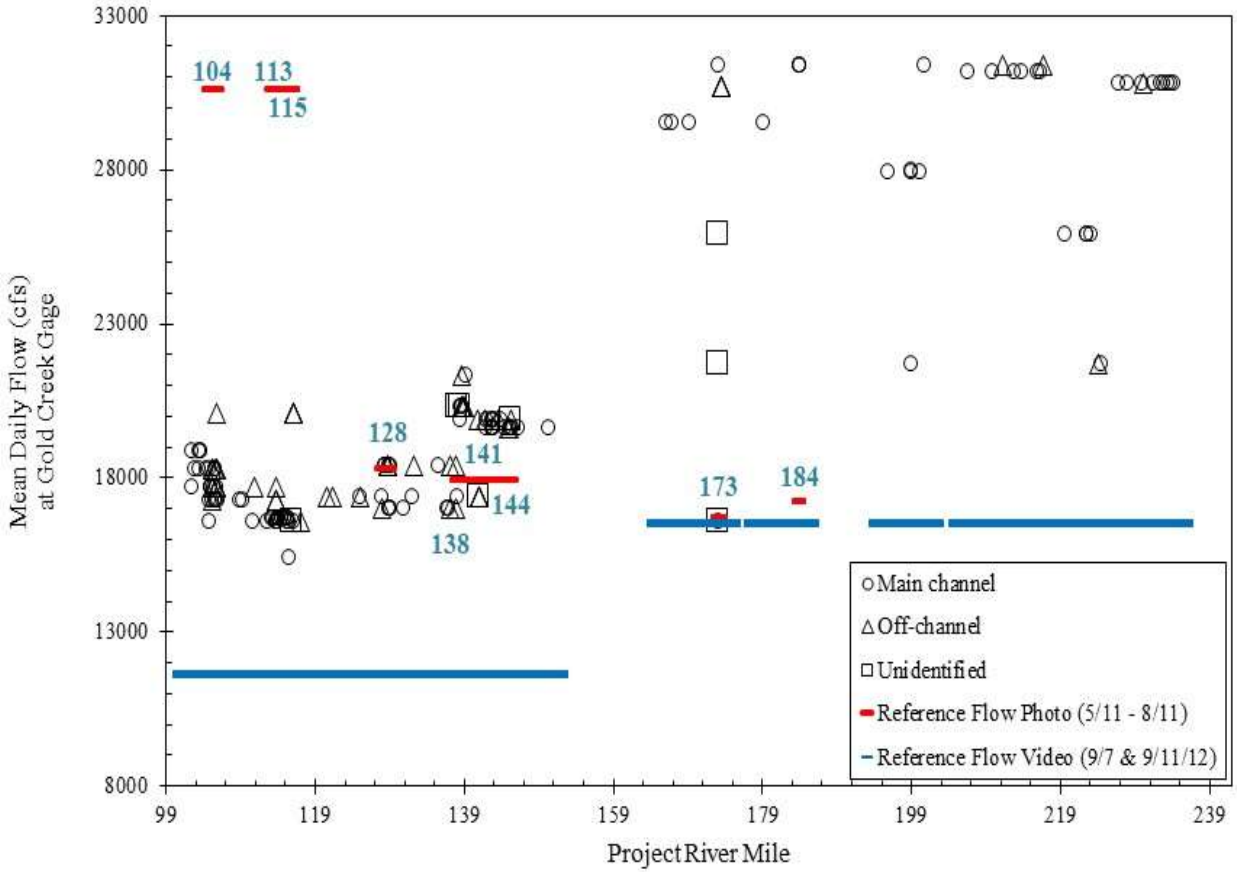
RSP 9.9 Habitat Characterization and Mapping Study

- Mapped aquatic habitat for over 200 miles of mainstem river and 25 tributaries
- Combination of remote mapping and field surveys
  - Remote imagery used LiDAR, aerial photography, high resolution video
  - Field surveys a modified version of the US Forest Service protocol

RSP 9.9 Habitat Characterization and Mapping Study

- Field surveys August 2 - September 22
- Surveyed 184 accessible, randomly-selected mainstem habitat units (92 outside of FAs)
- 100% ground-mapping within focus areas
- 14 accessible UR Tributaries and MR above DC: Completed surveys in 28 of 31 geomorphic reaches
- 7 accessible MR Tributaries below DC: Completed surveys in 4 tribs in ZHI
- No access partially or fully limited surveys in 23 tributaries, 1 FA, adjacent mainstem habitats

RSP 9.9 Comparison of Field and Remote Mapping Flows

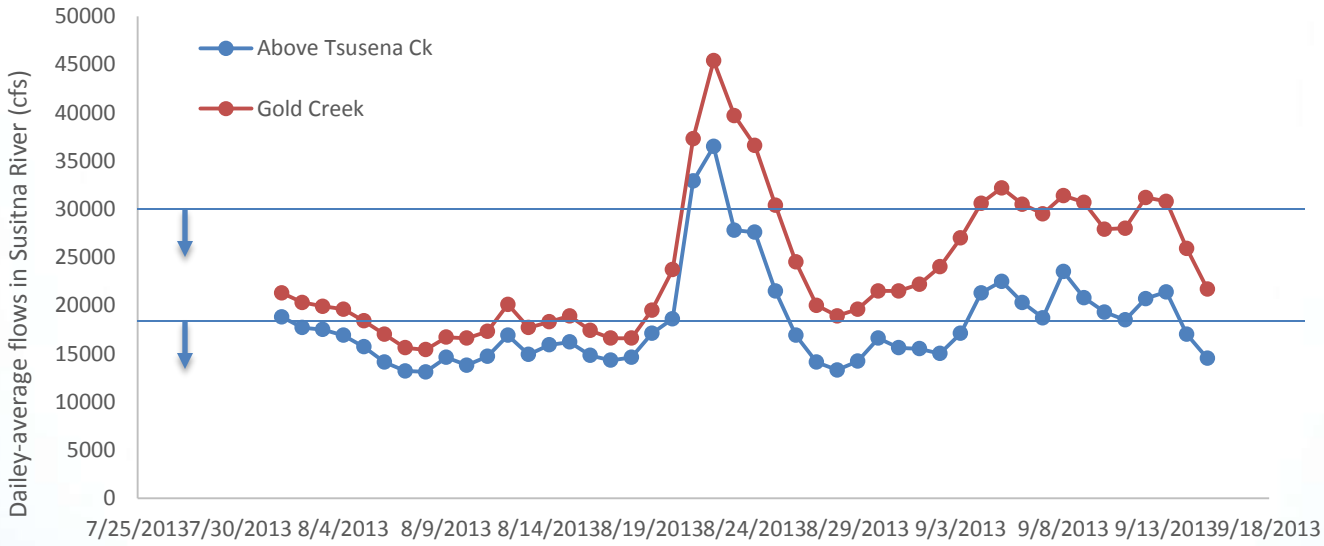


Upper flow targets:

- Upland Sloughs < 30,000 cfs
- Mainstem and Side Channels < 25,000 cfs
- Side Sloughs < 18,000 cfs

RSP 9.9 Field Mapping Near Reference Flows

- UR mapped during second half of field effort
- Flows were higher than anticipated
- Generally within upper bounds



Upper targets for field mapping

- Upland Sloughs

  < 30,000 cfs
- Mainstem and Side Channels

  < 25,000 cfs
- Side Sloughs

  < 18,000 cfs

RSP 9.9 QA/QC Progress for 2013 Field Data

	QC1	QC2	QC3
			11.15.2013
UR mainstem			
MR mainstem			
Tributaries below Canyon			
Tributaries above Canyon			

RSP 9.9 UR Field Effort by Geomorphic Reach

UPPER RIVER 2013 STATUS	Remote channel type	Remote macrounit	Remote mesounit	Random selection	Available units	UR1	UR2	UR3	UR4	UR5	UR6	TOTAL
	Main channel	single main channel										
			rapid	7	0	.	.	.	.	.	.	.
			riffle	7	7	0	0	5	2	0	0	7
			run/glide	7	7	0	0	4	2	0	1	7
			pool	7	0	.	.	.	.	.	.	.
			backwater	7	0	.	.	.	.	.	.	.
			clearwater plume	7	0	.	.	.	.	.	.	.
		split MC		7	7	0	0	0	4	1	1	6
		multi split MC		7	0	.	.	.	.	.	.	.
		side channel		7	7	0	0	0	3	0	3	6
		tributary mouth		7	7	0	0	0	0	0	0	0
	Off-channel	side slough		5	5	0	0	1	2	0	0	3
		side slough with beaver influence		2	0	0	0	0	0	0	0	.
		upland slough		5	5	0	0	0	4	0	0	4
		upland slough with beaver influence		2	0	0	0	0	0	0	0	.

QC3 in progress

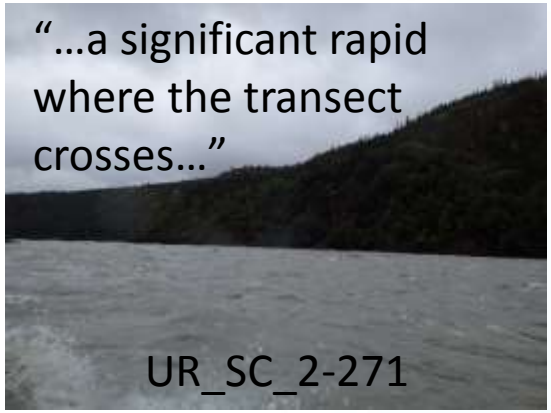
RSP 9.9 MR Field Effort by Geomorphic Reach

QC3 in progress

MIDDLE RIVER 2013 STATUS	Remote channel type	Remote macrounit	Remote mesounit	Random selection	Available units	MR1	MR2	MR3	MR4	MR5	MR6	MR7	MR8	TOTAL outside FA	FA
	Main channel	single main channel													
			rapid	7	0	.	.	.	.	.	.	.	.	.	.
			riffle	7	7	0	1	1	0	0	1	1	0	4	2
			run/glide	7	7	0	0	1	0	0	3	2	1	7	10
			pool	7	0	.	.	.	.	.	.	.	.	.	.
			backwater	7	0	.	.	.	.	.	.	.	.	.	.
			clearwater plume	7	7	0	0	0	0	0	0	0	0	0	1
		split MC		7	7	0	0	1	0	1	2	3	1	8	12
		multi split MC		7	7	0	0	0	0	0	2	0	5	7	9
		side channel		7	7	0	0	1	0	0	2	1	2	6	43
		tributary mouth		7	7	0	0	0	0	0	0	0	0	0	5
	Off-channel	side slough		5	5	0	0	0	0	0	4	1	0	5	12
		side slough with beaver influence		2	1	0	0	0	0	0	0	1	0	1	
		upland slough		5	5	0	0	0	0	0	2	3	0	5	17
		upland slough with beaver influence		2	2	0	0	0	0	0	2	0	0	2	

RSP 9.9 Field Survey Limitations

- *Access*
  - Dangerous: rapids, Devils Canyon, MR riffles, 1 UR side channel
- *QC process*
  - QC3 process for tributary mouths
  - QC3 process for tributary reaches
- *Selection errors*
  - MR clearwater plume switch from macro- to mesohabitat type; not included in random selection
  - Errors in the reproduction of line mapping for field crews (1 each of SMC, SS, US, SC)



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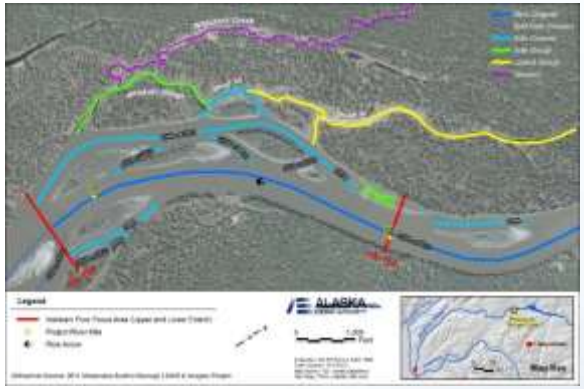
RSP 9.9 Variance

- Denied access to ANCSA lands prevented mapping in 4 UR tributaries, 6 MR tributaries above DC, 13 MR tributaries below DC, FA151, adjacent mainstem habitats

RSP 9.9 Plan for 2014 field effort

- Upper River additional SMC, SC, US, SS mesohabitat
- Main River mesohabitat, 1 SC
- Clearwater plumes outside of FAs
- Additional tributaries, lower order
- Additional surveys dependent on access



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RSP 9.11 Fish Passage Feasibility Study

- Preparing informational package (for January 8, 2014 distribution)
  - Evaluation criteria and process update/overview
  - Biological performance tool brief
  - Updated biological appendices as needed
- Next Meetings
  - Meeting #4a: January 16, 2014 (web call)
    - Review information package distributed on January 8, 2014
    - Updates on workshop information, meeting notes, schedule.
    - Prepare for Brainstorm Meeting
  - Workshop #2: March 18-20, 2014 (Seattle)
    - Attendance in person required
    - Alternatives will be developed via facilitated brainstorm session
- No variances to methods

RSP 9.12 Fish Passage Barriers

- Field surveys 20-25 September
- Within ZHI of 7 MR tributaries outside of Focus Areas
  - Gold Cr, Fourth of July Cr, Sherman Cr, Fifth of July Cr, Deadhorse Cr, Lane Cr, Chase Cr
- Thalweg profiles, channel cross sections, creek mouths surveyed
- Discharge measurements, velocity and qualitative substrate data collected

RSP 9.12 Fish Passage Barriers

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RSP 9.12 Fish Passage Barriers

Barriers in tributaries above DC:

- Four potential barriers surveyed for height/length via helicopter (no access) Sept 26.
- One potential barrier upstream of the dam site surveyed on the ground by Habitat Mapping crew on Sept 12.

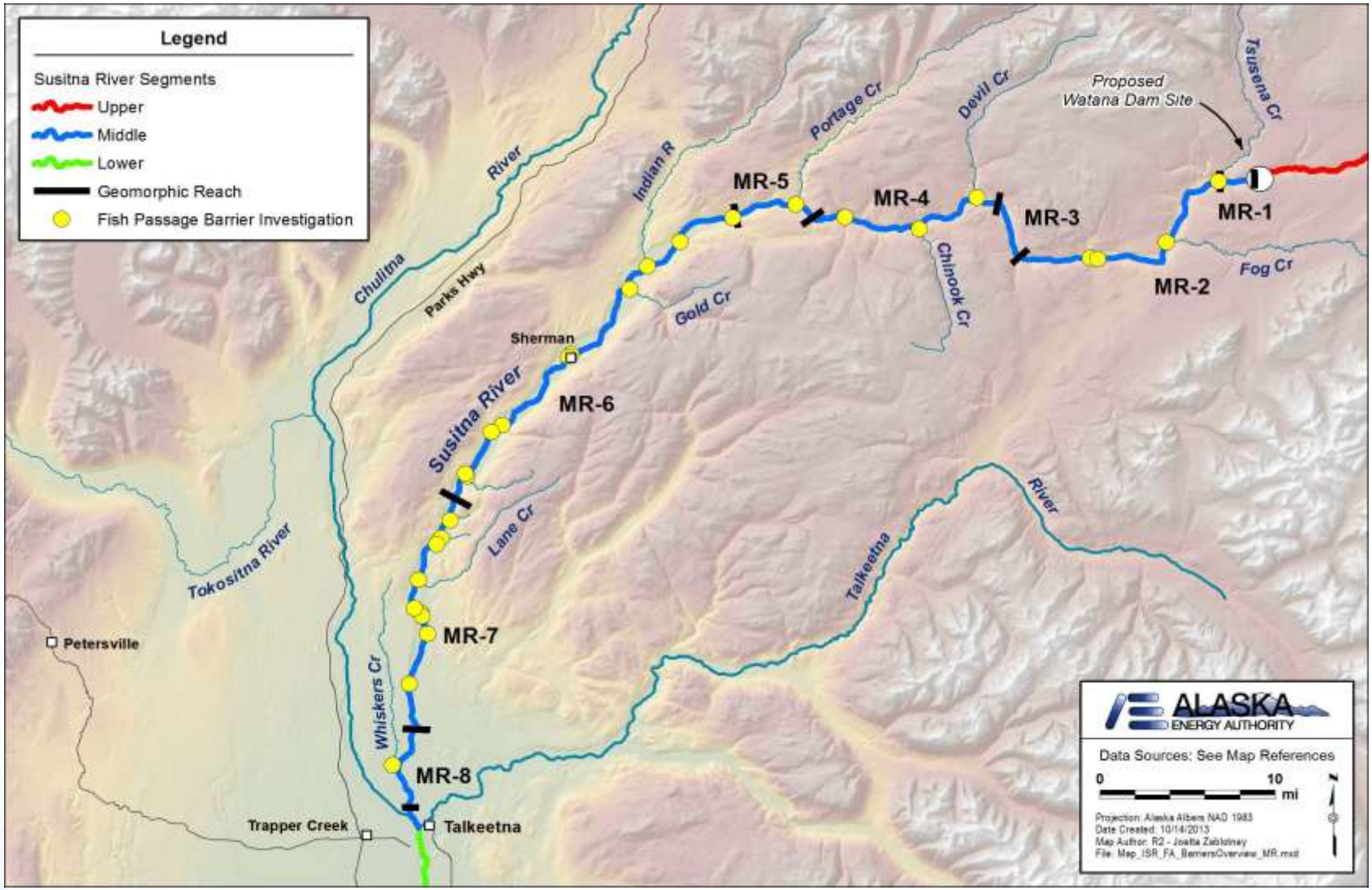

Figure 4.3-1. Locations of all tributaries both within and outside of focus areas examined for barrier analysis in 2013 and 2014.

RSP 9.12 Fish Passage Barriers

Next Steps

- Data QAQC
- Review of target species and passage criteria with Technical Team
  - Target species list (with IFS 8.5)
    - Resident and salmonid
    - Life stage - juvenile and adult
  - Passage Criteria – Velocity, Leaping, Depth
- Varial zone tributary selection for modelling (for GEO 6.5)
- Passage criteria application/integration with GEO and ICE

RSP 9.12 Fish Passage Barriers

Variances

- Access limited ground surveys to one tributary; used aerial height evaluation technique.

RSP 9.14 Genetic Baseline Study

Q4 2013 progress

- Field collections – season completed
- Interrelated studies – final tissue collections from 2013 received at ADF&G's Gene Conservation Lab
- Final 2013 in-season weekly update sent October 7
- ISR development
- Presentation at Mat-Su salmon symposium
- Laboratory analysis begun

RSP 9.14 Genetic Baseline Study

Field collection summary from 2013

- 1,131 adult Chinook salmon
- 111 juvenile Chinook salmon
- 641 chum salmon
- 68 coho salmon
- 1,041 pink salmon
- 295 sockeye salmon
- Target of 50 resident fish species met for 9 of 20 targeted species:
  - burbot, Dolly Varden, eulachon, Arctic grayling, slimy sculpin, threespine stickleback, longnose sucker, rainbow trout, and round whitefish
- Additional collections for backup from adult salmon radiotagged at Curry: 609 Chinook, 201 chum, 232 coho, 199 pink, and 139 sockeye salmon

RSP 9.14 Genetic Baseline Study

Variances

- Land access restricted sampling locations.
- Weather limited sampling effort during late summer.
- Only one sample collected for odd-year pink salmon run in the Chulitna River.

RSP 9.14 Genetic Baseline Study

Next Steps

- Extract DNA from 2013 collections (Q4)
- SNP analysis (Q4)
- Complete ISR (Q1 2014)
- Agency consultations for 2014 Implementation Plan (Q1 2014)
- Draft 2014 Implementation Plan (Q1 2014)

RSP 9.16 Eulachon Study

- Preliminary Findings Presented Sep. 3
  - ADF&G confirmed minimal numbers of eulachon in fish wheels after sampling ceased – corroborates lack of clearly defined separate runs in 2013
  - Discussions led to more clearly defined plan to integrate aerial telemetry and boat-based efforts to identify spawning locations in 2014
- Initial Study Report
  - All data reviewed and submitted
  - ISR in preparation

RSP 9.16 Eulachon Study

Variances:

- Blocking weir was removed from sonar station as it appeared to alter fish behavior.
- Dip netting around sonar was expanded to avoid spawning fish.
- Sonar sampling ceased at 2 fish per minute instead of 0 fish per day.
- No mortality sensors available for small radiotags.
- Flight schedule not as intensive as proposed.
- In addition to radiotelemetry, added visual identification of potential spawning sites for sampling.
- Habitat data collected at 3 random sites instead of grid sampling.

RSP 9.17 Cook Inlet Beluga Whale Study

- Aerial Surveys
  - Conducted 17 aerial surveys from May 6 - Oct. 11
  - Surveys complete as per Study Plan
- Video and Photos
  - Video near mouth recorded Sep. 13-24
  - Live video monitored Sep. 25 through Oct. 17
  - Still photos at mouth taken Sep. 3-24 (every 5 seconds)
  - Still photos at PRM 10-16 taken Jul. 1 through Oct. 8 (every minute)

RSP 9.17 Cook Inlet Beluga Whale Study

- Aerial Surveys
  - Conducted 17 aerial surveys from May 6 through Oct. 11
  - 42 CIBW groups; 722 CIBW individuals sighted
  - 660 white; 57 gray; 5 dark gray
  - Most sightings nearshore; none “in” the Susitna River
  - No sightings Sep. – Oct.
  - 24 groups of harbor seals; 1,973 individuals

RSP 9.17 Cook Inlet Beluga Whale Study

Aerial Survey Summaries

Date	Survey Start	Primary Tide	Beluga-White	Beluga-Gray	Beluga – Dark Gray
May 6	10:00	L	6	1	0
May 13	12:20	I	17	1	0
May 19	13:30	H	2	1	0
May 27	10:30	I	34	6	0
Jun 11	14:30	L	68	6	0
Jun 21	15:00	I	25	0	0
Jun 27	09:45	H	0	0	0
Jul 05	12:00	L	33	6	0
Jul 17	15:18	I	115	3	1
Jul 30	14:10	H	123	13	1
Aug 15	07:57	L	143	8	0
Aug 24	11:31	I	67	10	1
Aug 30	14:15	H	28	2	2
Sep 20	14:30	L	0	0	0
Sep 24	10:30	H	0	0	0
Sep 30	10:00	L	0	0	0
Oct 11	11:55	H	0	0	0

RSP 9.17 Cook Inlet Beluga Whale Study

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RSP 9.17 Cook Inlet Beluga Whale Study

- Video and Photos
  - Video recorded near mouth Sep. 13-24 still under review; some CIBWs observed
  - No CIBWs observed during live video monitoring Sep. 25 - Oct. 17
  - All 467,000 still photos retrieved from cameras at video stations reviewed - 2 CIBW groups; 3 CIBW individuals sighted
  - Photos from PRM 10-16 still under review – No CIBWs to date

RSP 9.17 Cook Inlet Beluga Whale Study

Example Still Image

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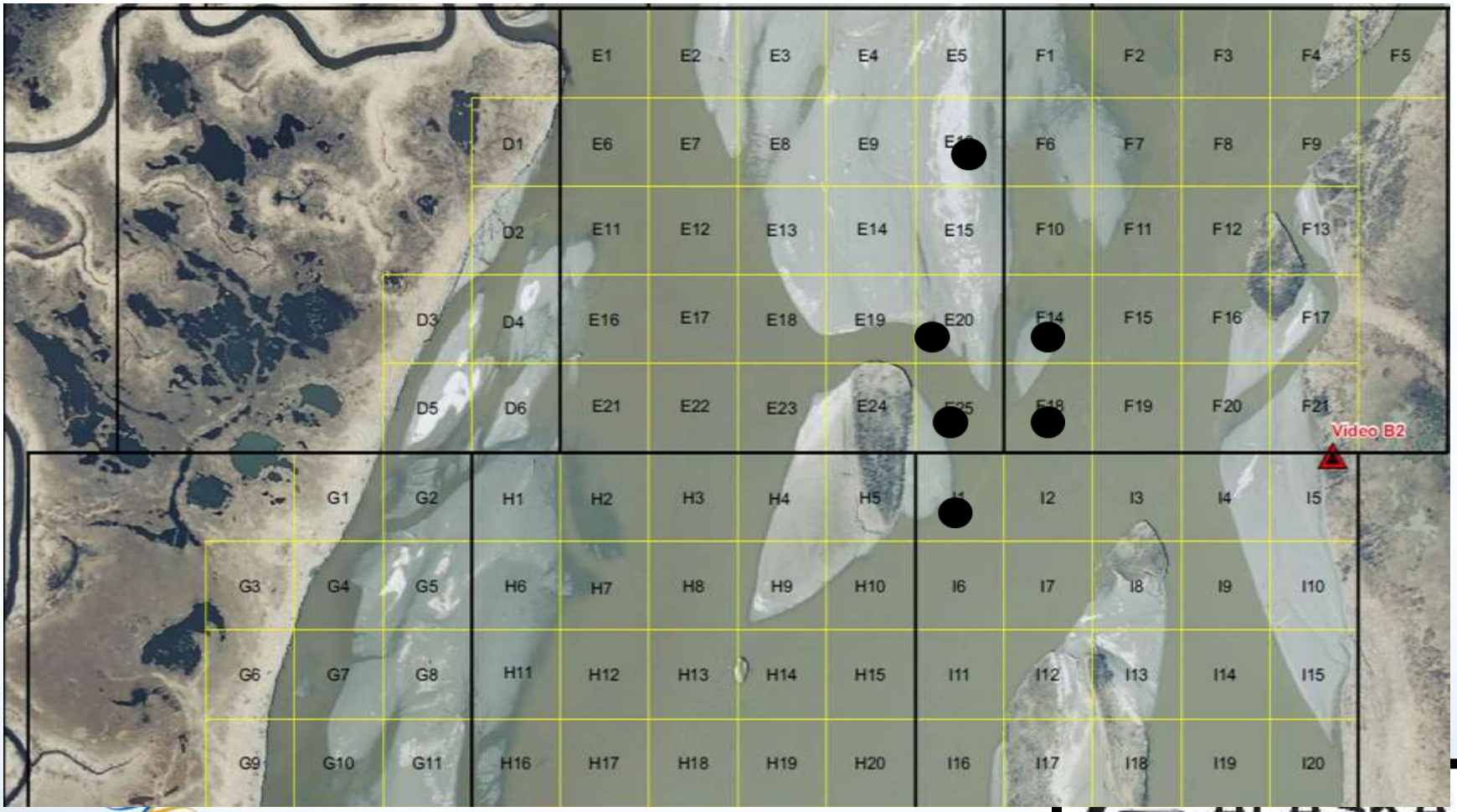
Example from Recorded Video



RSP 9.17 Cook Inlet Beluga Whale Study

- Variances
  - Aerial Surveys
    - Did not use an inclinometer to enter angle of sightings; use of GPS and Mysticetus software rendered these unnecessary
    - Environmental data updated as conditions warranted rather than every 30 minutes; conditions good to excellent for all surveys
  - Video and Photos
    - Live video feed not established until Sep.25
      - Video recorded Sep. 13-24
      - Still photos every 5 seconds Sep. 3-24
      - No CIBWs sighted during numerous visits to attempt repairs
      - Will be able to use aerial survey data from another study to supplement 2013 information