Susitna-Watana Hydroelectric Project Document ARLIS Uniform Cover Page

| Title: | | |
|--|----------------------------|----------------------|
| Study of fish distribution and abundance in the upper Susitna Riv plan Section 9.5 : Initial study report Part A: Appendices | er, Study | SuWa 223 |
| Author(s) – Personal: | | |
| Author(s) – Corporate: | | |
| R2 Resource Consultants, Inc. | | |
| AEA-identified category, if specified: Initial study report | | |
| AEA-identified series, if specified: | | |
| Series (ARLIS-assigned report number): Susitna-Watana Hydroelectric Project document number 223 | Existing numbe | rs on document: |
| Published by: [Anchorage : Alaska Energy Authority, 2014] | June 2014 | |
| Published for: Alaska Energy Authority | Date or date ra | nge of report: |
| Volume and/or Part numbers: | Final or Draft s | tatus, as indicated: |
| Document type: | Pagination: 93 p. in va | rious pagings |
| Related work(s): The following parts of Section 9.5 appear in separate files: Part A; Part A Appendices; Part B; Part C. | Pages added/cl | nanged by ARLIS: |
| Notes: Contents: Appendix A. Distribution of fish radio-tagged in the upp | oer Susitna I | River, 2013 |

Appendix B. Fish distribution maps for the upper Susitna River, 2012 and 2013 -- Appendix C. Seasonal fish distribution, upper Susitna River, 2012 and 2013 -- Appendix D. Upper river fish observations and relative abundance, 2013.

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- PART A APPENDIX A: DISTRIBUTION OF FISH RADIO-TAGGED IN THE UPPER SUSITNA RIVER, 2013
- PART A APPENDIX B: FISH DISTRIBUTION MAPS FOR THE UPPER SUSITNA RIVER 2012 AND 2013
- PART A APPENDIX C: SEASONAL FISH DISTRIBUTION, UPPER SUSITNA RIVER 2012 AND 2013
- PART A APPENDIX D: UPPER RIVER FISH OBSERVATIONS AND RELATIVE ABUNDANCE, 2013

Susitna-Watana Hydroelectric Project (FERC No. 14241)

Study of Fish Distribution and Abundance in the Upper Susitna River (9.5)

Part A - Appendix A

Distribution of Fish Radio-Tagged in the Upper
Susitna River, 2013

Initial Study Report

Prepared for

Alaska Energy Authority



Prepared by

R2 Resource Consultants, Inc.

June 2014

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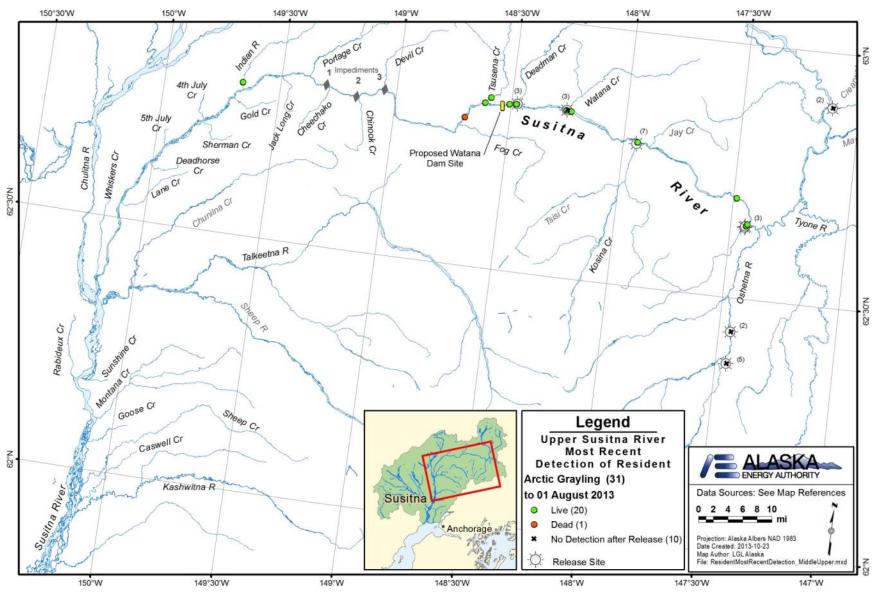


Figure A1. Distribution of Upper River radio-tagged Arctic grayling August 1, 2013.

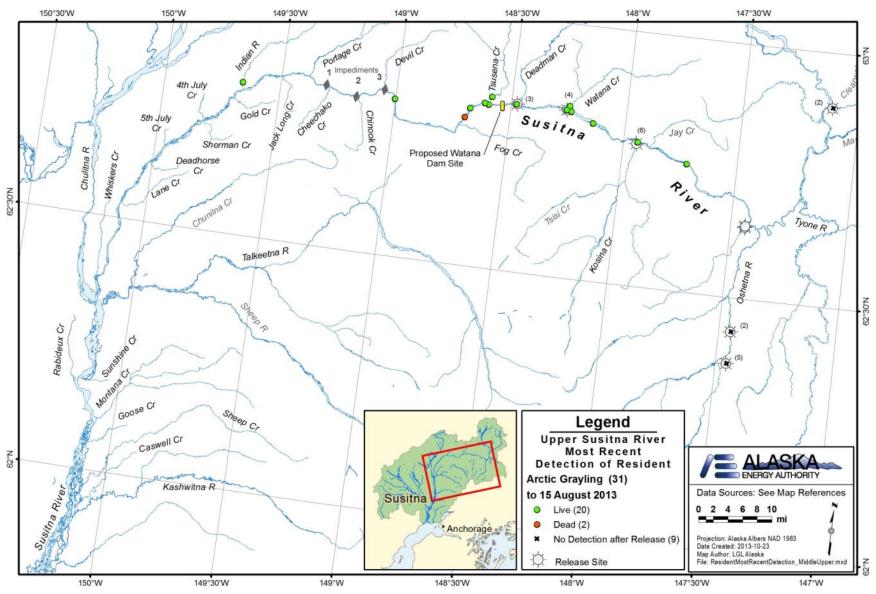


Figure A2. Distribution of Upper River radio-tagged Arctic grayling August 15, 2013.

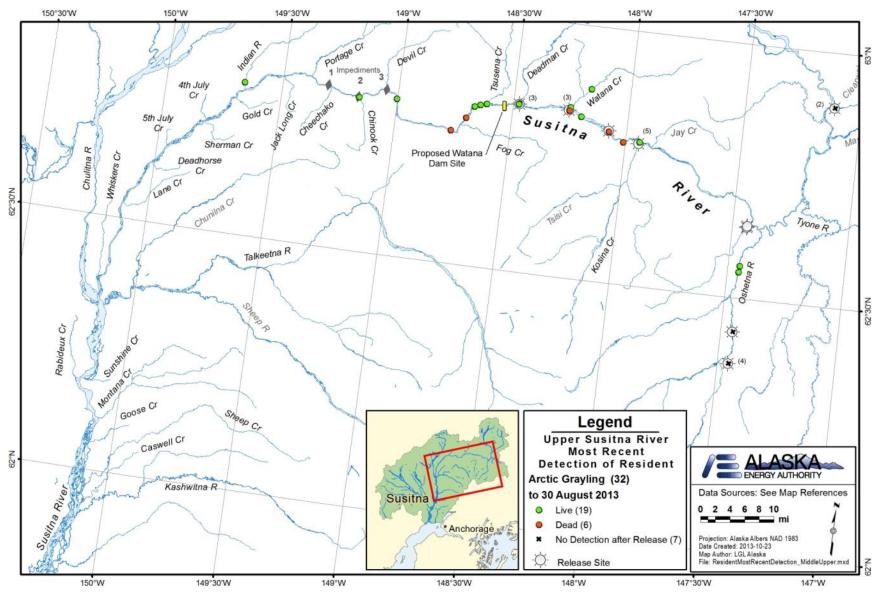


Figure A3. Distribution of Upper River radio-tagged Arctic grayling August 30, 2013.

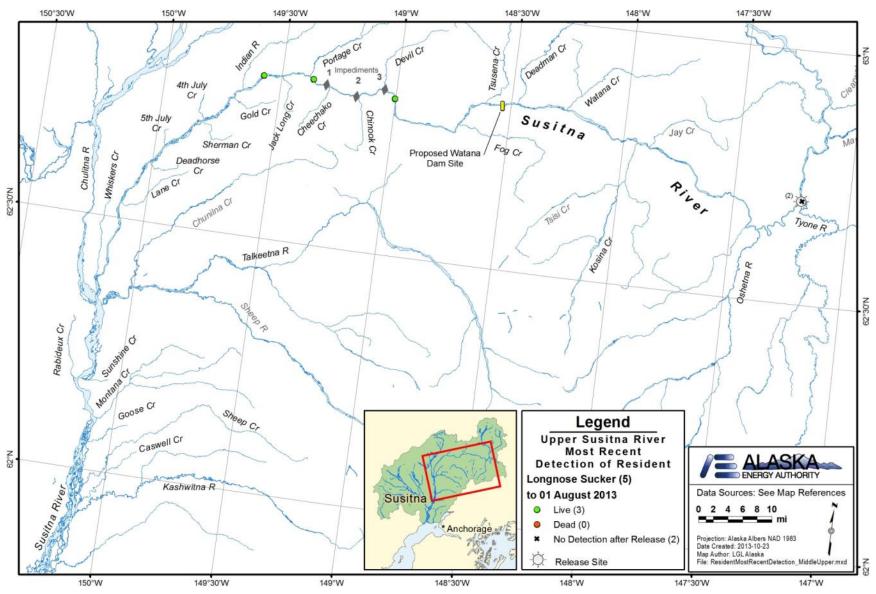


Figure A4. Distribution of Upper River radio-tagged longnose suckers August 1, 2013.

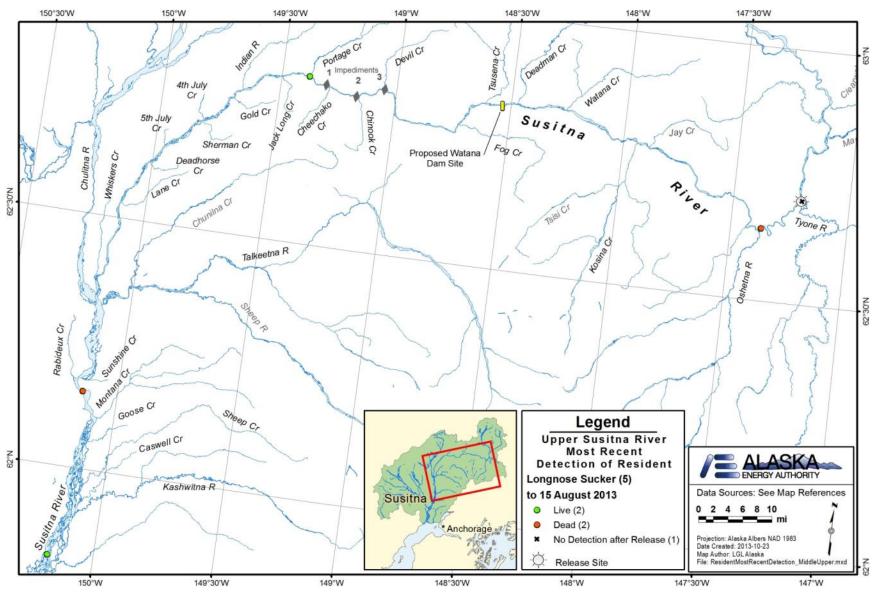


Figure A5. Distribution of Upper River radio-tagged longnose suckers August 15, 2013.

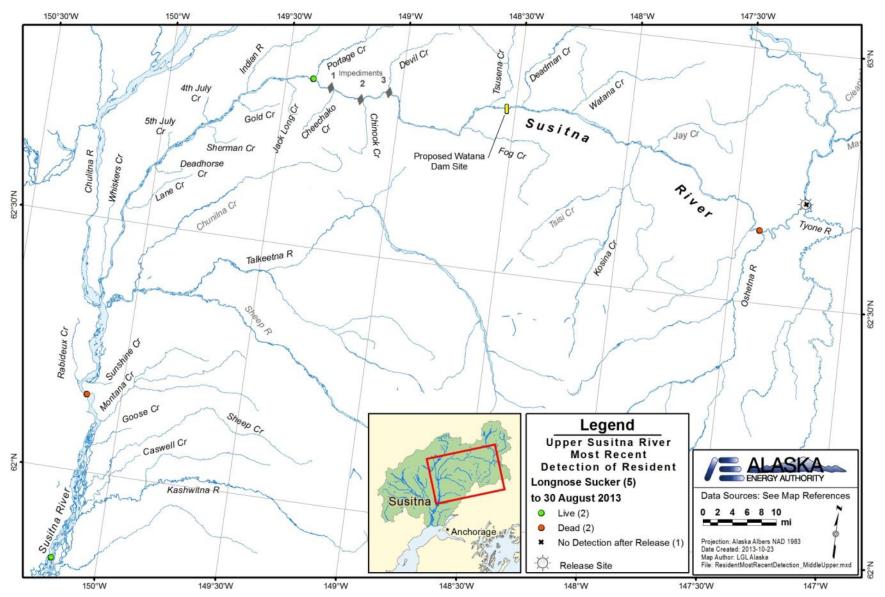


Figure A6. Distribution of Upper River radio-tagged longnose suckers August 30, 2013.

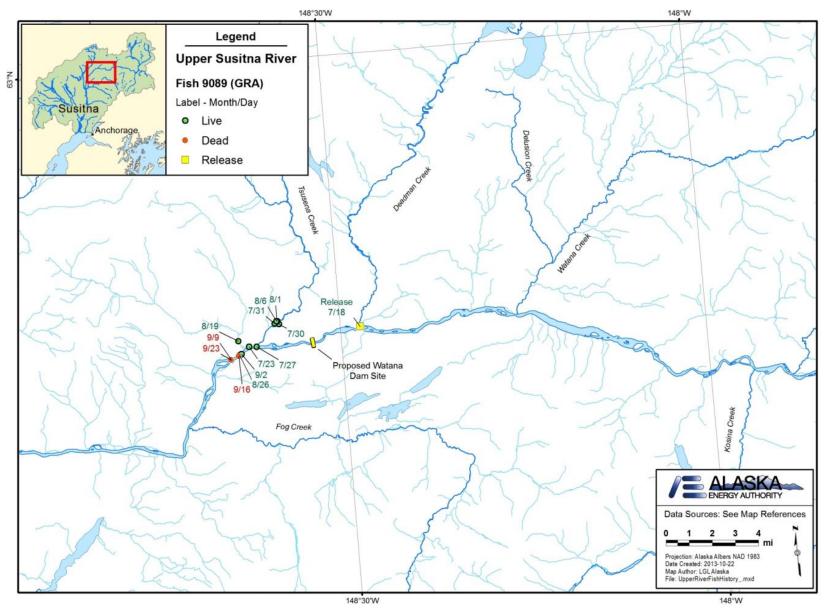


Figure A7. Movements of Upper River Arctic grayling tag ID 9089 through September, 2013.

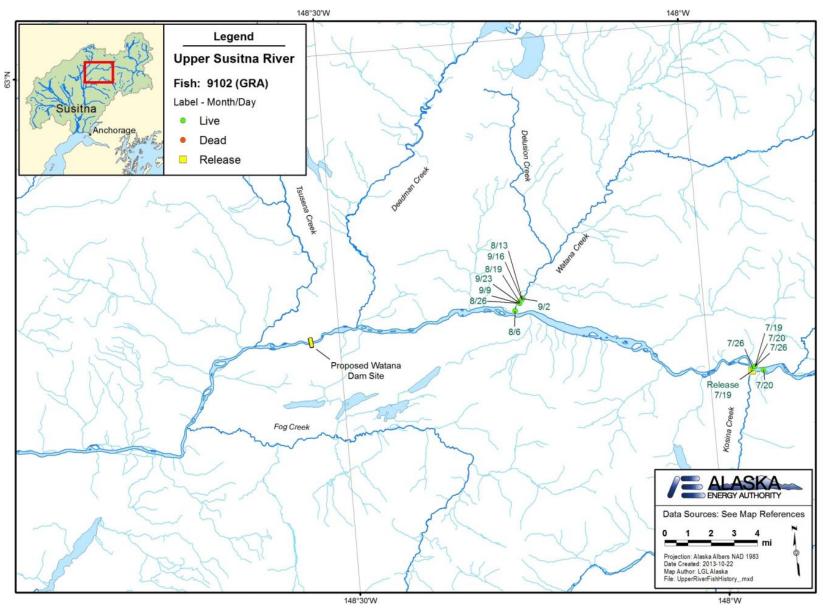


Figure A8. Movements of Upper River Arctic grayling tag ID 9102 through September, 2013.

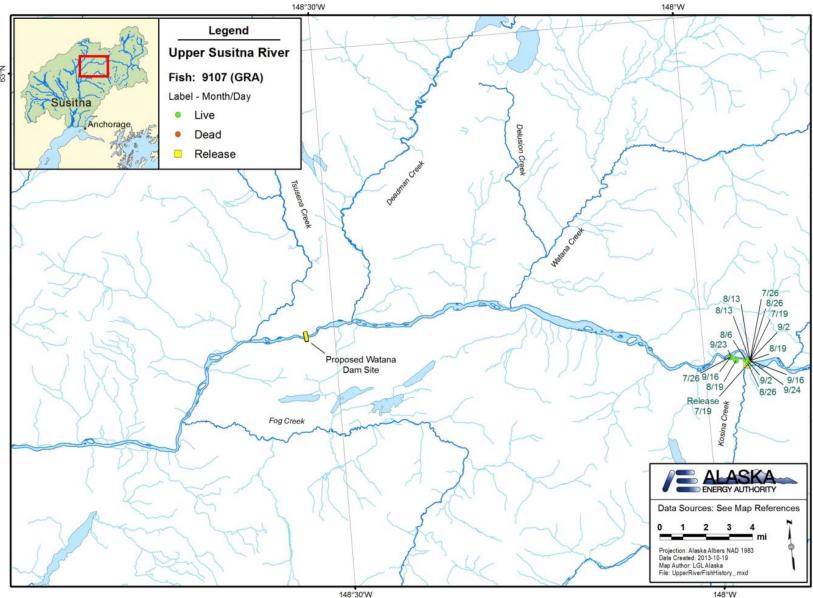


Figure A9. Movements of Upper River Arctic grayling tag ID 9107 through September, 2013.

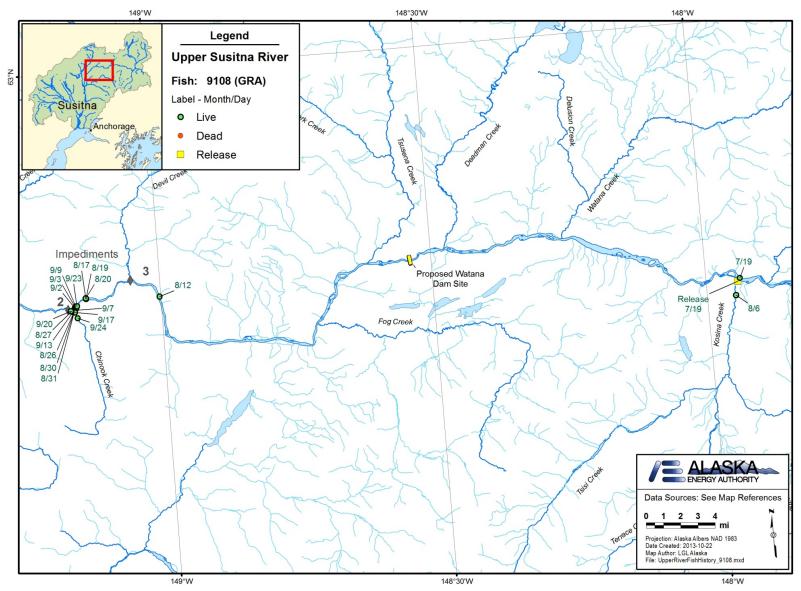


Figure A10. Movements of Upper River Arctic grayling tag ID 9108 through September, 2013.

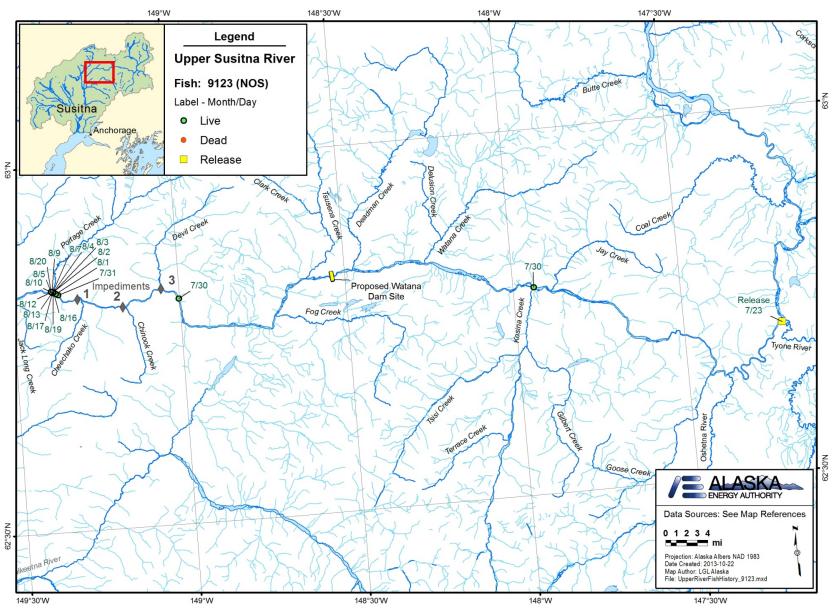


Figure A11. Movements of Upper River longnose sucker tag ID 9123 through September, 2013.

Susitna-Watana Hydroelectric Project (FERC No. 14241)

Study of Fish Distribution and Abundance in the Upper Susitna River (9.5)

Part A - Appendix B
Fish Distribution Maps for the Upper Susitna River,
2012 and 2013

Initial Study Report

Prepared for

Alaska Energy Authority



Prepared by

R2 Resource Consultants, Inc.

June 2014

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1. FISH DISTRIBUTION

The following distribution maps depict the occurrence of species from Fish Distribution and Abundance sampling efforts including early life history sampling, directed tributary sampling, GRTS tributary sampling, mainstem transect sampling, rotary screw trapping,, PIT array detections, resident fish radio-telemetry detections, directed fish sampling efforts for interrelated studies, genetics sampling efforts (ISR Study 9.14), and metal/mercury sampling efforts (ISR Study 5.5). The 2013 data for fish distribution was pooled with 2012 fish distribution data (HDR 2013). These maps do not represent the distribution of adult Chinook salmon, as that was documented in detail in ISR Study 9.7.

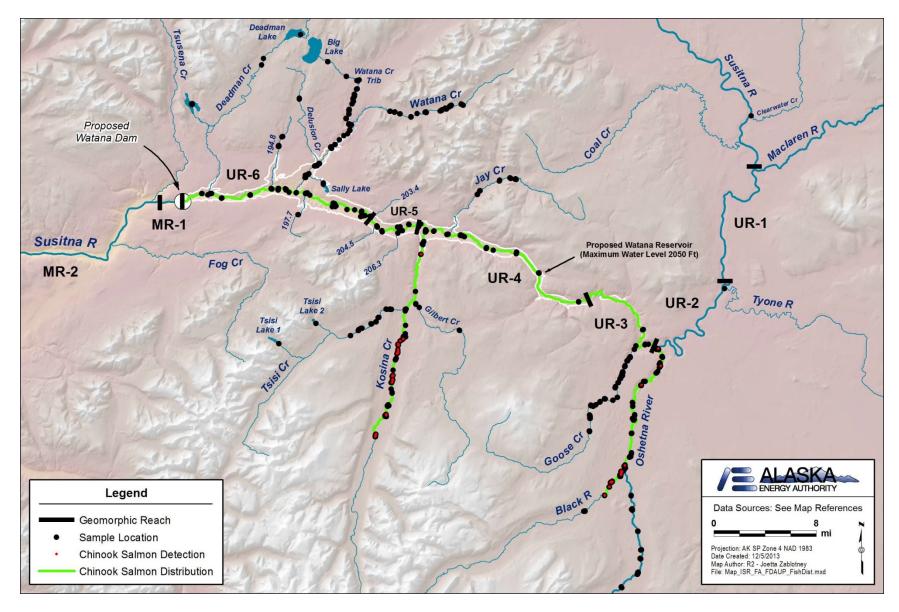


Figure B1. Upper Susitna River juvenile Chinook salmon distribution 2013. No juvenile Chinook were detected upstream of the proposed dam site in 2012. Adult Chinook distributions are reported in ISR Study 9.7.

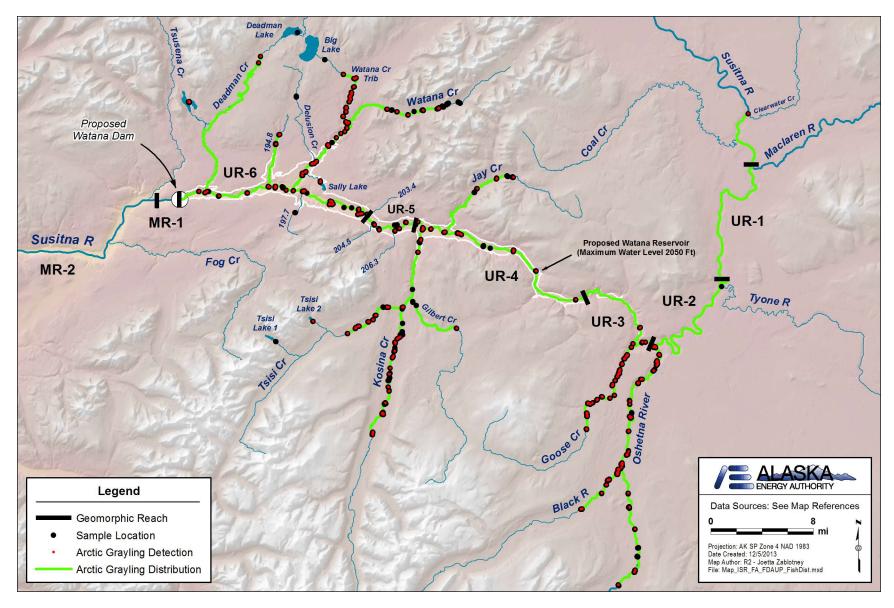


Figure B2. Upper Susitna River Arctic grayling distribution 2012 and 2013.

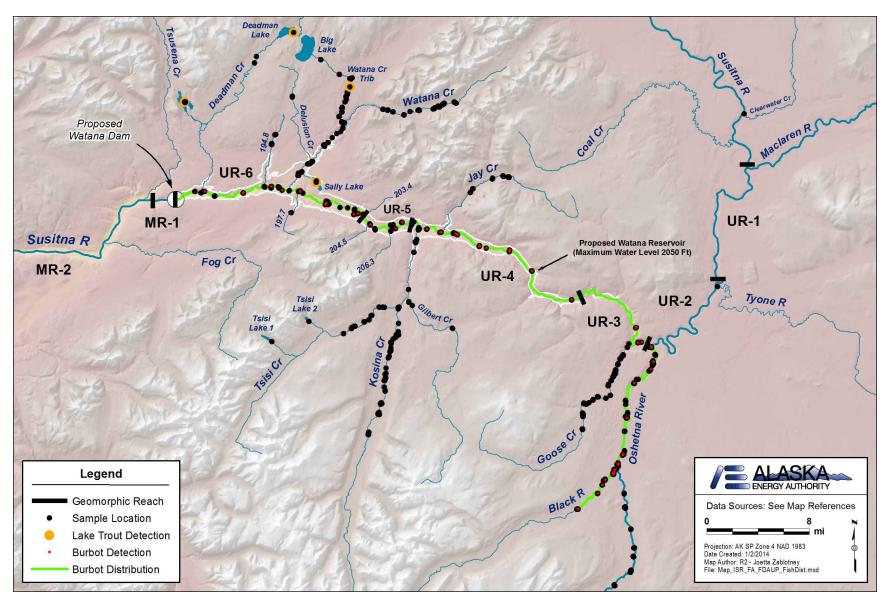


Figure B3. Upper Susitna River burbot and lake trout distribution 2012 and 2013.

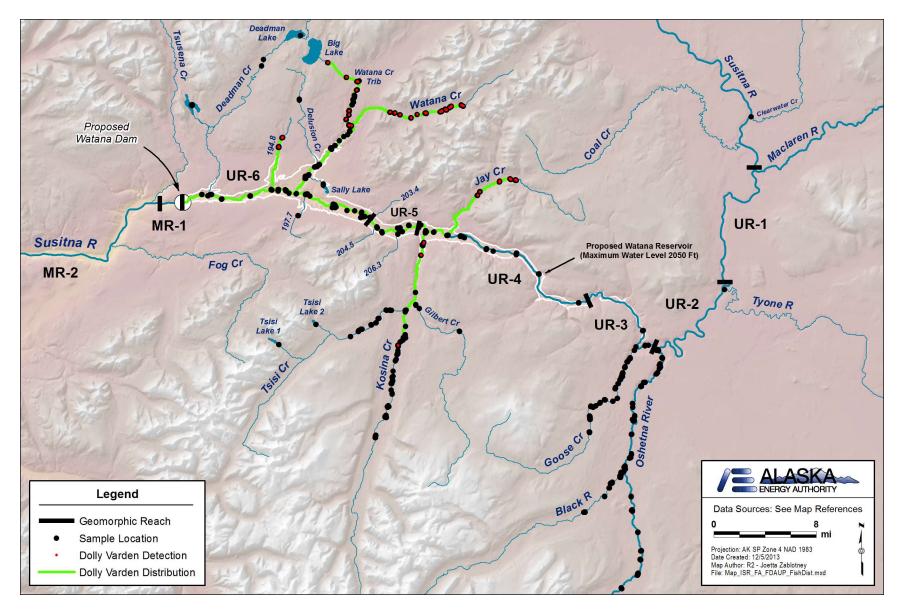


Figure B4. Upper Susitna River Dolly Varden distribution 2012 and 2013.

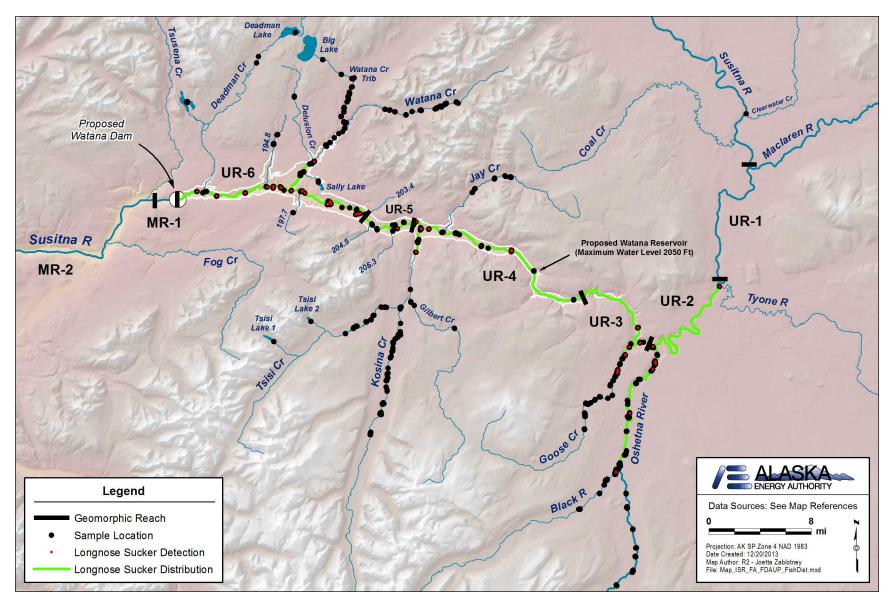


Figure B5. Upper Susitna River longnose sucker distribution 2012 and 2013.

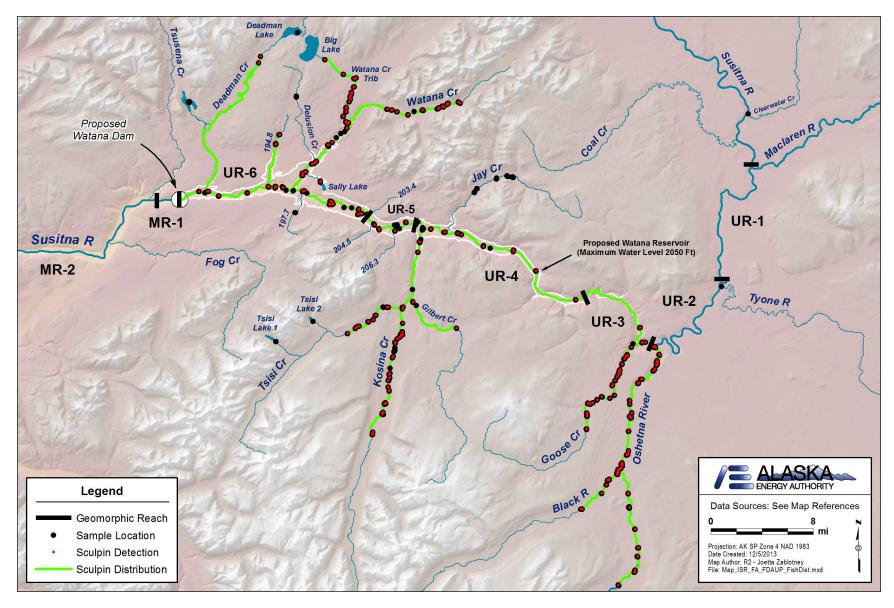


Figure B6. Upper Susitna River sculpin distribution 2012 and 2013.

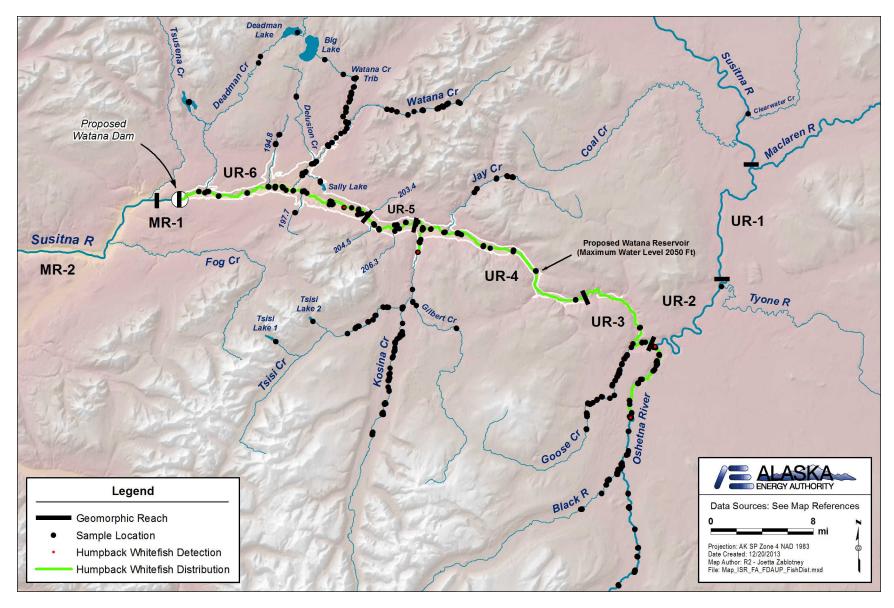


Figure B7. Upper Susitna River humpback whitefish distribution 2012 and 2013.

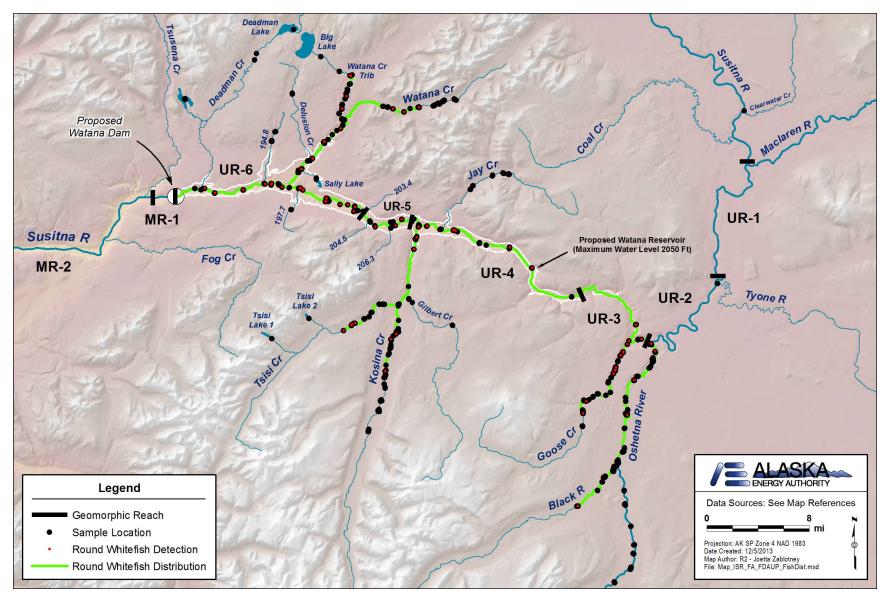


Figure B8. Upper Susitna River round whitefish distribution 2012 and 2013.

Susitna-Watana Hydroelectric Project (FERC No. 14241)

Study of Fish Distribution and Abundance in the Upper Susitna River (9.5)

Part A - Appendix C Seasonal Fish Distribution, Upper Susitna River 2012 and 2013

Initial Study Report

Prepared for

Alaska Energy Authority



Prepared by

R2 Resource Consultants, Inc.

June 2014

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Table C1. Seasonal distribution of juvenile Chinook salmon in the Upper Susitna River, 2012 and 2013.

| Location | PRM | ELH (June 4-June 30) | Early Summer (July 1- August 10) | Late Summer (August 11 - Sept 9) | Fall (Sept 10 - Oct 7) |
|--|----------------|----------------------|----------------------------------|-----------------------------------|------------------------|
| Susita River Devils Canyon to Watana Dam | 166.1-187.1 | | Х | | |
| Watana Dam | 187.1 | | | | |
| Susitna River UR-6 | 187.1-203.4 | | | | |
| Susitna River UR-5 | 203.4-208.1 | | | | |
| Susitna River UR-4 | 208.1-224.9 | | | | |
| Susitna River UR-3 | 224.9-234.5 | | | | |
| Watana Reservoir at Full Pool | 232.5 | | | | |
| Susitna above Oshetna | >234.5 | | | | |
| Aerial Mainstem - Dam site to Oshetna | 187.1-235.1 | | | | |
| Deadman Creek | 189.4 | | | | |
| Unnamed Tributary | 194.8 | | | | |
| Watana Creek | 196.9 | | | | |
| Watana Creek Tributary: Unnamed L1 | N/A | | | | |
| Watana Creek Tributary: Unnamed L3 | N/A | | | | |
| Watana Creek Tributary: Unnamed R3 | N/A | | | | |
| Watana Creek Tributary: Unnamed R5 | N/A | | | | |
| Unnamed Tributary | 197.7 | | | | |
| Unnamed Tributary | 198.4 | | | | |
| Unnamed Tributary | 203.4 | | | | |
| Unnamed Tributary | 204.3 | | | | |
| Unnamed Tributary | 206.3 | | | | |
| Kosina Creek | 209.1 | | X | X | X |
| Kosina Creek Tributary: Tsisi Creek | N/A | | | | |
| Kosina Creek Tributary: Gilbert Creek | N/A | | | | |
| Kosina Creek Tributary: Unnamed | N/A | | | | |
| Jay Creek | 211.0 | | | | |
| Goose Creek | 232.8 | | | | |
| Oshetna River | 235.1 | | X | | X |
| Oshetna River Tributary: Black River | N/A | X | Χ | Χ | Χ |
| Tyone River | 247.3 | | | | |
| Clearwater Creek | 266.6 | | | | |
| Deadman Basin Lake: Deadman Lake | N/A | | | | |
| Deadman Basin Lake: Unnamed | N/A | | | | |
| Watana Basin Lake: Sally Lake | N/A | | | | |
| Unnamed Tributary Lake: Unnamed | 205.9 | | | | |
| Kosina Basin Lake: Tsisi Lake | N/A | | | | |
| Notes: Shaded cells indicate that a given loca | tion was sampl | ed. | | | |

Table C2. Seasonal distribution of Arctic grayling in the Upper Susitna River, 2012 and 2013.

| Location | PRM | ELH (June 4-June 30) | Early Summer (July 1- August 10) | Late Summer (August 11 - Sept 9) | Fall (Sept 10 - Oct 7) |
|---|----------------------|--------------------------------------|----------------------------------|----------------------------------|------------------------|
| Susita River Devils Canyon to Watana Dam | 166.1-187.1 | | ■ X ■ | ■ ■ X ■ | ■ X |
| Watana Dam | 187.1 | | | | |
| Susitna River UR-6 | 187.1-203.4 | | _ X_ X_ | <u>x</u> | x |
| Susitna River UR-5 | 203.4-208.1 | | x | | X |
| Susitna River UR-4 | 208.1-224.9 | | ■ X■ X■ | ■ ■ ※ ■ | ı X |
| Susitna River UR-3 | 224.9-234.5 | | ■ X ■ | | ■ X |
| Watana Reservoir at Full Pool | 232.5 | | | | |
| Susitna above Oshetna | >234.5 | | . X | | |
| Aerial Mainstem - Dam site to Oshetna | 187.1-235.1 | | ■ X ■ | ■ ■ X ■ | |
| Deadman Creek | 189.4 | | ■ X■ ■ | | I |
| Unnamed Tributary | 194.8 | | _ • _ • _X _ • _ | | • |
| Watana Creek | 196.9 | | X | . X | X |
| Watana Creek Tributary: Unnamed L1 | N/A | | _ x | | |
| Watana Creek Tributary: Unnamed L3 | N/A | | | | |
| Watana Creek Tributary: Unnamed R3 | N/A | | X | | |
| Watana Creek Tributary: Unnamed R5 | N/A | | | X | _ |
| Unnamed Tributary | 197.7 | | x | | |
| Unnamed Tributary | 198.4 | | | | |
| Unnamed Tributary | 203.4 | | X | | |
| Unnamed Tributary | 204.3 | | | | |
| Unnamed Tributary | 206.3 | | | | |
| Kosina Creek | 209.1 | X | ■ X ■ | ■ ■ X ■ | ■ X |
| Kosina Creek Tributary: Tsisi Creek | N/A | X | x | X X | _ x |
| Kosina Creek Tributary: Gilbert Creek | N/A | | X | | |
| Kosina Creek Tributary: Unnamed | N/A | | | | |
| Jay Creek | 211.0 | | ■ X■ ■ | | Ι χ |
| Goose Creek | 232.8 | | X X | <u>x</u> | ■ X |
| Oshetna River | 235.1 | X | . X | . X | X |
| Oshetna River Tributary: Black River | N/A | X | ■ X■ ■ | . | X |
| Tyone River | 247.3 | | | | |
| Clearwater Creek | 266.6 | | X | | |
| Deadman Basin Lake: Deadman Lake | N/A | | | | |
| Deadman Basin Lake: Unnamed | N/A | | | X | |
| Watana Basin Lake: Sally Lake | N/A | | X | | |
| Unnamed Tributary Lake: Unnamed | 205.9 | | | | |
| Kosina Basin Lake: Tsisi Lake | N/A | X | | | |
| Notes: Shaded cells indicate that a given location was sampled. Sti | ppled cells indicate | that aerial flight for radio tags oc | curred. | | |

Table C3. Seasonal distribution of burbot in the Upper Susitna River, 2012 and 2013.

| Location | PRM | ELH (June 4-June 30) | Early Summer (July 1- August 10) | Late Summer (August 11 - Sept 9) | Fall (Sept 10 - Oct 7) |
|--|-------------|----------------------|----------------------------------|----------------------------------|------------------------|
| Susita River Devils Canyon to Watana Dam | 166.1-187.1 | | Х | X | Х |
| Watana Dam | 187.1 | | | | |
| Susitna River UR-6 | 187.1-203.4 | | X | X | X |
| Susitna River UR-5 | 203.4-208.1 | | X | | Χ |
| Susitna River UR-4 | 208.1-224.9 | | X | X | Χ |
| Susitna River UR-3 | 224.9-234.5 | | X | X | Χ |
| Watana Reservoir at Full Pool | 232.5 | | | | |
| Susitna above Oshetna | >234.5 | | | | |
| Aerial Mainstem - Dam site to Oshetna | 187.1-235.1 | | | | |
| Deadman Creek | 189.4 | | | | |
| Unnamed Tributary | 194.8 | | | | |
| Watana Creek | 196.9 | | | | |
| Watana Creek Tributary: Unnamed L1 | N/A | | | | |
| Watana Creek Tributary: Unnamed L3 | N/A | | | | |
| Watana Creek Tributary: Unnamed R3 | N/A | | | | |
| Watana Creek Tributary: Unnamed R5 | N/A | | | | |
| Unnamed Tributary | 197.7 | | | | |
| Unnamed Tributary | 198.4 | | | | |
| Unnamed Tributary | 203.4 | | | | |
| Unnamed Tributary | 204.3 | | | | |
| Unnamed Tributary | 206.3 | | | | |
| Kosina Creek | 209.1 | X | | | |
| Kosina Creek Tributary: Tsisi Creek | N/A | | | | |
| Kosina Creek Tributary: Gilbert Creek | N/A | | | | |
| Kosina Creek Tributary: Unnamed | N/A | | | | |
| Jay Creek | 211.0 | | | X | X |
| Goose Creek | 232.8 | | | | |
| Oshetna River | 235.1 | X | X | X | Χ |
| Oshetna River Tributary: Black River | N/A | Χ | X | Χ | Χ |
| Tyone River | 247.3 | | | | |
| Clearwater Creek | 266.6 | | | | |
| Deadman Basin Lake: Deadman Lake | N/A | | | | |
| Deadman Basin Lake: Unnamed | N/A | | | | |
| Watana Basin Lake: Sally Lake | N/A | | | | |
| Unnamed Tributary Lake: Unnamed | 205.9 | | | | |
| Kosina Basin Lake: Tsisi Lake | N/A | | | | |
| Notes: Shaded cells indicate that a given location was s | sampled. | | | | |

Table C4. Seasonal distribution of Dolly Varden in the Upper Susitna River, 2012 and 2013.

| Location | PRM | ELH (June 4-June 30) | Early Summer (July 1- August 10) | Late Summer (August 11 - Sept 9) | Fall (Sept 10 - Oct 7) |
|--|-------------|----------------------|----------------------------------|----------------------------------|------------------------|
| Susita River Devils Canyon to Watana Dam | 166.1-187.1 | | X | Х | Χ |
| Watana Dam | 187.1 | | | | |
| Susitna River UR-6 | 187.1-203.4 | | | | |
| Susitna River UR-5 | 203.4-208.1 | | | | |
| Susitna River UR-4 | 208.1-224.9 | | | | |
| Susitna River UR-3 | 224.9-234.5 | | | | |
| Watana Reservoir at Full Pool | 232.5 | | | | |
| Susitna above Oshetna | >234.5 | | | | |
| Aerial Mainstem - Dam site to Oshetna | 187.1-235.1 | | | | |
| Deadman Creek | 189.4 | | | | |
| Unnamed Tributary | 194.8 | | X | X | Χ |
| Watana Creek | 196.9 | | X | X | Χ |
| Watana Creek Tributary: Unnamed L1 | N/A | | | | |
| Watana Creek Tributary: Unnamed L3 | N/A | | | | |
| Watana Creek Tributary: Unnamed R3 | N/A | | | | |
| Watana Creek Tributary: Unnamed R5 | N/A | | Χ | X | X |
| Unnamed Tributary | 197.7 | | | | |
| Unnamed Tributary | 198.4 | | | X | |
| Unnamed Tributary | 203.4 | | | | |
| Unnamed Tributary | 204.3 | | | | |
| Unnamed Tributary | 206.3 | | | | |
| Kosina Creek | 209.1 | Χ | | X | Χ |
| Kosina Creek Tributary: Tsisi Creek | N/A | | | | |
| Kosina Creek Tributary: Gilbert Creek | N/A | | | | |
| Kosina Creek Tributary: Unnamed | N/A | | | | |
| Jay Creek | 211.0 | | X | X | X |
| Goose Creek | 232.8 | | | | |
| Oshetna River | 235.1 | | | | |
| Oshetna River Tributary: Black River | N/A | | | | |
| Tyone River | 247.3 | | | | |
| Clearwater Creek | 266.6 | | | | |
| Deadman Basin Lake: Deadman Lake | N/A | | | | |
| Deadman Basin Lake: Unnamed | N/A | | | | |
| Watana Basin Lake: Sally Lake | N/A | | | | |
| Unnamed Tributary Lake: Unnamed | 205.9 | | | | |
| Kosina Basin Lake: Tsisi Lake | N/A | | | | |
| Notes: Shaded cells indicate that a given location was sar | mpled. | | | | |

Table C5. Seasonal distribution of lake trout in the Upper Susitna River, 2012 and 2013.

| Location | PRM | ELH (June 4-June 30) | Early Summer (July 1- August 10) | Late Summer (August 11 - Sept 9) | Fall (Sept 10 - Oct 7) |
|--|-------------|----------------------|----------------------------------|-----------------------------------|------------------------|
| Susita River Devils Canyon to Watana Dam | 166.1-187.1 | | | | |
| Watana Dam | 187.1 | | | | |
| Susitna River UR-6 | 187.1-203.4 | | | | |
| Susitna River UR-5 | 203.4-208.1 | | | | |
| Susitna River UR-4 | 208.1-224.9 | | | | |
| Susitna River UR-3 | 224.9-234.5 | | | | |
| Watana Reservoir at Full Pool | 232.5 | | | | |
| Susitna above Oshetna | >234.5 | | | | |
| Aerial Mainstem - Dam site to Oshetna | 187.1-235.1 | | | | |
| Deadman Creek | 189.4 | | | | |
| Unnamed Tributary | 194.8 | | | | |
| Watana Creek | 196.9 | | | | |
| Watana Creek Tributary: Unnamed L1 | N/A | | | | |
| Watana Creek Tributary: Unnamed L3 | N/A | | | | |
| Watana Creek Tributary: Unnamed R3 | N/A | | | | |
| Watana Creek Tributary: Unnamed R5 | N/A | | | | X |
| Unnamed Tributary | 197.7 | | | | |
| Unnamed Tributary | 198.4 | | | | |
| Unnamed Tributary | 203.4 | | | | |
| Unnamed Tributary | 204.3 | | | | |
| Unnamed Tributary | 206.3 | | | | |
| Kosina Creek | 209.1 | | | | |
| Kosina Creek Tributary: Tsisi Creek | N/A | | | | |
| Kosina Creek Tributary: Gilbert Creek | N/A | | | | |
| Kosina Creek Tributary: Unnamed | N/A | | | | |
| Jay Creek | 211.0 | | | | |
| Goose Creek | 232.8 | | | | |
| Oshetna River | 235.1 | | | | |
| Oshetna River Tributary: Black River | N/A | | | | |
| Tyone River | 247.3 | | | | |
| Clearwater Creek | 266.6 | | | | |
| Deadman Basin Lake: Deadman Lake | N/A | | | | Х |
| Deadman Basin Lake: Unnamed | N/A | | | X | |
| Watana Basin Lake: Sally Lake | N/A | | X | | |
| Unnamed Tributary Lake: Unnamed | 205.9 | | | | |
| Kosina Basin Lake: Tsisi Lake | N/A | | | | |
| Notes: Shaded cells indicate that a given location was sar | npled. | <u> </u> | | | |

Table C6. Seasonal distribution of longnose sucker in the Upper Susitna River, 2012 and 2013.

| Location | PRM | ELH (June 4-June 30) | Early Sum | mer (July 1 | 1- Aug | ust 10) | | Late Sumn | ner (Augu | st 11 - S | Sept 9) | | Fall (Sept 10 - Oct 7) |
|---|-------------------|---|--------------------|-------------|--------|---------|---|-----------|-----------|------------|---------|---|------------------------|
| Susita River Devils Canyon to Watana Dam | 166.1-187.1 | | | | Х | | | | | Х | | | X |
| Watana Dam | 187.1 | | | | | | | | | | | | |
| Susitna River UR-6 | 187.1-203.4 | | | | Х | | | | _ | Х | - | | _ X |
| Susitna River UR-5 | 203.4-208.1 | | | | | | | | | | | | X |
| Susitna River UR-4 | 208.1-224.9 | X | | • _ | ĸ | _ | _ | • | • | ■ X | | _ | ■ X |
| Susitna River UR-3 | 224.9-234.5 | | | _ | _ | _ | | _ | _ | _X | - | _ | _ X |
| Watana Reservoir at Full Pool | 232.5 | | | | | _ | | Ī | _ | | _ | _ | |
| Susitna above Oshetna | >234.5 | | | | X | | _ | | | X | _ | _ | |
| Aerial Mainstem - Dam site to Oshetna | 187.1-235.1 | | | | Х | | | | _ | X | | • | |
| Deadman Creek | 189.4 | | | | | | | | | | | | |
| Unnamed Tributary | 194.8 | | | | | - | | | | | • . | | |
| Watana Creek | 196.9 | | | _ | Х | _ | | _ | _ | - | | _ | _ |
| Watana Creek Tributary: Unnamed L1 | N/A | | | | | | | | | | | | |
| Watana Creek Tributary: Unnamed L3 | N/A | | | | | | | | | | | | |
| Watana Creek Tributary: Unnamed R3 | N/A | | | | | | | | | | | | |
| Watana Creek Tributary: Unnamed R5 | N/A | | | - | | _ | _ | | _ | | _ | _ | |
| Unnamed Tributary | 197.7 | | | _ | _ | _ | | | _ | | | | |
| Unnamed Tributary | 198.4 | | | | | | | | | | | | |
| Unnamed Tributary | 203.4 | | | | | | | | | | | | |
| Unnamed Tributary | 204.3 | | | | | | | | | | | | |
| Unnamed Tributary | 206.3 | | | | | | | | | | | | |
| Kosina Creek | 209.1 | X | | - | | - | | | | | | | X |
| Kosina Creek Tributary: Tsisi Creek | N/A | | _ ' | _ | | _ | | - | | | _ ' | | |
| Kosina Creek Tributary: Gilbert Creek | N/A | | | | | | | | _ | | | _ | |
| Kosina Creek Tributary: Unnamed | N/A | | | | | | | | | | | | |
| Jay Creek | 211.0 | | | • | | - | | | - | | | | |
| Goose Creek | 232.8 | | | | Х | | | | | Х | | | |
| Oshetna River | 235.1 | X | | _ | Х | _ | | _ | _ | Х | | _ | - X |
| Oshetna River Tributary: Black River | N/A | | _ | _ | | | | • | | ■ X | | _ | |
| Tyone River | 247.3 | | | | Х | | | | | | | | |
| Clearwater Creek | 266.6 | | | | | | | | | | | | |
| Deadman Basin Lake: Deadman Lake | N/A | | | | | | | | | | | | |
| Deadman Basin Lake: Unnamed | N/A | | | | | | | | | | | | |
| Watana Basin Lake: Sally Lake | N/A | | | | | | | | | | | | |
| Unnamed Tributary Lake: Unnamed | 205.9 | | | | | | | | | | | | |
| Kosina Basin Lake: Tsisi Lake | N/A | | | _ | _ | | | - | _ | | | | |
| Notes: Shaded cells indicate that a given location was sa | mpled. Stippled o | ells indicate that aerial flight for ra | idio tags occurred | l | | | | | | | | | |

Table C7. Seasonal distribution of sculpin in the Upper Susitna River, 2012 and 2013.

| Location | PRM | ELH (June 4-June 30) | Early Summer (July 1- August 10) | Late Summer (August 11 - Sept 9) | Fall (Sept 10 - Oct 7) |
|--|-------------|----------------------|----------------------------------|----------------------------------|------------------------|
| Susita River Devils Canyon to Watana Dam | 166.1-187.1 | | X | X | X |
| Watana Dam | 187.1 | | | | |
| Susitna River UR-6 | 187.1-203.4 | | X | X | X |
| Susitna River UR-5 | 203.4-208.1 | | X | X | X |
| Susitna River UR-4 | 208.1-224.9 | | X | X | X |
| Susitna River UR-3 | 224.9-234.5 | | X | X | X |
| Watana Reservoir at Full Pool | 232.5 | | | | |
| Susitna above Oshetna | >234.5 | | X | | |
| Aerial Mainstem - Dam site to Oshetna | 187.1-235.1 | | | | |
| Deadman Creek | 189.4 | | X | | |
| Unnamed Tributary | 194.8 | | X | X | X |
| Watana Creek | 196.9 | | X | X | X |
| Watana Creek Tributary: Unnamed L1 | N/A | | X | | |
| Watana Creek Tributary: Unnamed L3 | N/A | | X | | |
| Watana Creek Tributary: Unnamed R3 | N/A | | X | | |
| Watana Creek Tributary: Unnamed R5 | N/A | | | X | |
| Unnamed Tributary | 197.7 | | X | | |
| Unnamed Tributary | 198.4 | | | | |
| Unnamed Tributary | 203.4 | | X | | |
| Unnamed Tributary | 204.3 | | | | |
| Unnamed Tributary | 206.3 | | X | | |
| Kosina Creek | 209.1 | X | X | X | X |
| Kosina Creek Tributary: Tsisi Creek | N/A | X | X | X | X |
| Kosina Creek Tributary: Gilbert Creek | N/A | | X | | |
| Kosina Creek Tributary: Unnamed | N/A | | X | | |
| Jay Creek | 211.0 | | X | X | X |
| Goose Creek | 232.8 | | X | X | X |
| Oshetna River | 235.1 | X | X | X | X |
| Oshetna River Tributary: Black River | N/A | X | X | X | X |
| Tyone River | 247.3 | | | | |
| Clearwater Creek | 266.6 | | | | |
| Deadman Basin Lake: Deadman Lake | N/A | | | | |
| Deadman Basin Lake: Unnamed | N/A | | | | |
| Watana Basin Lake: Sally Lake | N/A | | X | | |
| Unnamed Tributary Lake: Unnamed | 205.9 | | | | |
| Kosina Basin Lake: Tsisi Lake | N/A | | | | |
| Notes: Shaded cells indicate that a given location was | sampled. | | | | |

Table C8. Seasonal distribution of humpback whitefish in the Upper Susitna River, 2012 and 2013.

| Location | PRM | ELH (June 4-June 30) | Early Summer (July 1- August 10) | Late Summer (August 11 - Sept 9) | Fall (Sept 10 - Oct 7) |
|---|-------------|----------------------|----------------------------------|----------------------------------|------------------------|
| Susita River Devils Canyon to Watana Dam | 166.1-187.1 | | | | |
| Watana Dam | 187.1 | | | | |
| Susitna River UR-6 | 187.1-203.4 | | | | X |
| Susitna River UR-5 | 203.4-208.1 | | | | |
| Susitna River UR-4 | 208.1-224.9 | | | | |
| Susitna River UR-3 | 224.9-234.5 | | | | |
| Watana Reservoir at Full Pool | 232.5 | | | | |
| Susitna above Oshetna | >234.5 | | | | |
| Aerial Mainstem - Dam site to Oshetna | 187.1-235.1 | | | | |
| Deadman Creek | 189.4 | | | | |
| Unnamed Tributary | 194.8 | | | | |
| Watana Creek | 196.9 | | | | |
| Watana Creek Tributary: Unnamed L1 | N/A | | | | |
| Watana Creek Tributary: Unnamed L3 | N/A | | | | |
| Watana Creek Tributary: Unnamed R3 | N/A | | | | |
| Watana Creek Tributary: Unnamed R5 | N/A | | | | |
| Unnamed Tributary | 197.7 | | | | |
| Unnamed Tributary | 198.4 | | | | |
| Unnamed Tributary | 203.4 | | | | |
| Unnamed Tributary | 204.3 | | | | |
| Unnamed Tributary | 206.3 | | | | |
| Kosina Creek | 209.1 | | | | X |
| Kosina Creek Tributary: Tsisi Creek | N/A | | | | |
| Kosina Creek Tributary: Gilbert Creek | N/A | | | | |
| Kosina Creek Tributary: Unnamed | N/A | | | | |
| Jay Creek | 211.0 | | | | |
| Goose Creek | 232.8 | | | | |
| Oshetna River | 235.1 | Х | X | X | |
| Oshetna River Tributary: Black River | N/A | | | | |
| Tyone River | 247.3 | | | | |
| Clearwater Creek | 266.6 | | | | |
| Deadman Basin Lake: Deadman Lake | N/A | | | | |
| Deadman Basin Lake: Unnamed | N/A | | | | |
| Watana Basin Lake: Sally Lake | N/A | | | | |
| Unnamed Tributary Lake: Unnamed | 205.9 | | | | |
| Kosina Basin Lake: Tsisi Lake | N/A | | | | |
| Notes: Shaded cells indicate that a given location wa | is sampled | | | | |

Table C9. Seasonal distribution of round whitefish in the Upper Susitna River, 2012 and 2013.

| Location | PRM | ELH (June 4-June 30) | Early Summer (July 1- August 10) | Late Summer (August 11 - Sept 9) | Fall (Sept 10 - Oct 7) |
|--|-------------|----------------------|----------------------------------|----------------------------------|------------------------|
| Susita River Devils Canyon to Watana Dam | 166.1-187.1 | | X | X | X |
| Watana Dam | 187.1 | | | | |
| Susitna River UR-6 | 187.1-203.4 | | X | X | X |
| Susitna River UR-5 | 203.4-208.1 | | | | Χ |
| Susitna River UR-4 | 208.1-224.9 | | | X | Χ |
| Susitna River UR-3 | 224.9-234.5 | | | X | Χ |
| Watana Reservoir at Full Pool | 232.5 | | | | |
| Susitna above Oshetna | >234.5 | | | | |
| Aerial Mainstem - Dam site to Oshetna | 187.1-235.1 | | | | |
| Deadman Creek | 189.4 | | | | |
| Unnamed Tributary | 194.8 | | | | |
| Watana Creek | 196.9 | | X | Χ | |
| Watana Creek Tributary: Unnamed L1 | N/A | | | | |
| Watana Creek Tributary: Unnamed L3 | N/A | | | | |
| Watana Creek Tributary: Unnamed R3 | N/A | | | | |
| Watana Creek Tributary: Unnamed R5 | N/A | | X | X | |
| Unnamed Tributary | 197.7 | | | | |
| Unnamed Tributary | 198.4 | | | | |
| Unnamed Tributary | 203.4 | | | | |
| Unnamed Tributary | 204.3 | | | | |
| Unnamed Tributary | 206.3 | | | | |
| Kosina Creek | 209.1 | X | X | X | X |
| Kosina Creek Tributary: Tsisi Creek | N/A | | Χ | | |
| Kosina Creek Tributary: Gilbert Creek | N/A | | | | |
| Kosina Creek Tributary: Unnamed | N/A | | | | |
| Jay Creek | 211.0 | | | | |
| Goose Creek | 232.8 | | X | Χ | Χ |
| Oshetna River | 235.1 | X | Χ | Χ | Χ |
| Oshetna River Tributary: Black River | N/A | | Χ | | |
| Tyone River | 247.3 | | | | |
| Clearwater Creek | 266.6 | | | | |
| Deadman Basin Lake: Deadman Lake | N/A | | | | |
| Deadman Basin Lake: Unnamed | N/A | | | | |
| Watana Basin Lake: Sally Lake | N/A | | | | |
| Unnamed Tributary Lake: Unnamed | 205.9 | | | | |
| Kosina Basin Lake: Tsisi Lake | N/A | | | | |
| Notes: Shaded cells indicate that a given location was sar | npled. | | | | |

Susitna-Watana Hydroelectric Project (FERC No. 14241)

Study of Fish Distribution and Abundance in the Upper Susitna River (9.5)

Part A - Appendix D
Upper River Fish Observations and Relative
Abundance, 2013

Initial Study Report

Prepared for

Alaska Energy Authority



Prepared by

R2 Resource Consultants, Inc.

June 2014

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|--|
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1. FISH OBSERVATIONS

Table D1. Upper Susitna River fish observations, 2013.

Upper River

| Geomorphic Reach/PRM | Habitat | Sample Type | Salmon, Chinook (juvenile) | Arctic grayling | Burbot | Dolly Varden | Longnose sucker | Sculpin | Trout, lake | Whitefish, humpback | Whitefish, round | Whitefish, undifferentiated | Grand Total |
|---|-------------------------------------|----------------|----------------------------|-----------------|--------|--------------|-----------------|---------|-------------|---------------------|------------------|-----------------------------|-------------|
| | Oshetna River | ELH, GRTS | 2 | 329 | 18 | | 5 | , | | 1 | 5 | | 2,247 |
| UR-2 | Oshetna River: Off-Channel | GRTS | | 7 | | | | 84 | | | | | 91 |
| 234.5-248.6 | Black River | ELH, GRTS | 73 | 103 | 13 | | 1 | 939 | | | 3 | | 1,132 |
| | Black River: Off-Channel | GRTS | 2 | 19 | 1 | | | 121 | | | | | 143 |
| Upper Extent Watana Reservoir PRM 232.5 | | | | | | | | | | | | | |
| UR-3 | Susitna River | Transect | | 57 | 12 | | 4 | 44 | | 2 | 17 | | 136 |
| 224.9-234.5 | Goose Creek | GRTS | | 1,502 | | | 7 | 281 | | | 42 | | 1,832 |
| | Susitna River | Transect | | 81 | 46 | | 15 | | | 1 | 20 | | 295 |
| UR-4 | Jay Creek | Direct | | 42 | 3 | 137 | | 37 | | | | | 219 |
| 208.1-224.9 | Kosina Creek | ELH, GRTS | 116 | 339 | 1 | 3 | 9 | 447 | | 1 | 14 | | 930 |
| 200.1-224.5 | Tsisi Creek | ELH, GRTS | | 310 | | | | 487 | | | 4 | 1 | 802 |
| | Tsisi Creek: Off-Channel | GRTS | | 23 | | | | 32 | | | | | 55 |
| UR-5 203.4-208.1 | Susitna River | Transect | | 19 | 6 | | | 25 | | | 13 | | 63 |
| | Susitna River | Transect | | 161 | 16 | | 79 | 188 | | | 28 | | 472 |
| | Susitna River: Off-Channel | Transect | | 3 | | | 16 | 75 | | | 1 | | 95 |
| UR-6 | Watana Creek | GRTS | | 272 | | 449 | 1 | 563 | | | 17 | | 1,302 |
| 187.1-203.4 | Watana Creek: Off-Channel | GRTS | | | | 13 | | 15 | | | | | 28 |
| 107.1-203.4 | Watana Creek Tributary | GRTS | | 736 | | 56 | | 169 | 1 | | 7 | | 969 |
| | Watana Creek Tributary: Off-channel | GRTS | | | | 2 | | 24 | | | | | 26 |
| | Unnamed Tributary 194.8 | GRTS | | 16 | | 71 | 1 | 158 | | | | | 246 |
| | Proposed I | Natana Dam Loc | ation | PRM 18 | 7.1 | | | | | | | | |
| | Grand Total | | 193 | 4,019 | 116 | 731 | 138 | 5,708 | 1 | 5 | 171 | 1 | 11,083 |

Table D2. Upper River Chinook salmon observations by habitat, 2013.

Juvenile Chinook salmon

| Geomorphic | | | | | | | | | | | | |
|-------------|---|---------------|-----------------|---------|--------------|-------------|------|--------------------|--|--|--|--|
| Reach /PRM | Habitat | Macrohabitat | Mesohabitat | Spring | Early Summer | Late Summer | Fall | Grand Total | | | | |
| | Black River | | Boulder Riffle | | 4 | 10 | 3 | 17 | | | | |
| | | | Riffle | 6 | | | 1 | 7 | | | | |
| UR-2 | | | Run | | 38 | 5 | 6 | 49 | | | | |
| 234.5-248.6 | Black River: Off-Channel | Upland Slough | Run | | 2 | | | 2 | | | | |
| | Oshetna River | | Boulder Riffle | | 1 | | | 1 | | | | |
| | | | Riffle | | | | 1 | 1 | | | | |
| | Upper Extent Watana Reservoir PRM 232.5 | | | | | | | | | | | |
| | Kosina Creek | | Boulder Riffle | | 28 | 24 | 16 | 68 | | | | |
| UR-4 | | | Glide | | | | 3 | 3 | | | | |
| 208.1-224.9 | | | Riffle | | | 6 | 8 | 14 | | | | |
| | | | Run | | | 27 | 4 | 31 | | | | |
| | | Proposed Wat | tana Dam Locati | ion PRM | 187.1 | | | | | | | |
| Grand Total | | | | 6 | 73 | 72 | 42 | 193 | | | | |

Table D3. Upper River Arctic grayling (all life stages) observations by habitat, 2013.

| UR-2 O. 234.5-248.6 O. | Black River Black River: Off-Channel Oshetna River Oshetna River: Off-Channel Gusitna River Goose Creek | | Mesohabitat Boulder Riffle Pool Riffle Run Pool Run Boulder Riffle Glide Percolation Channel Rapid Rapid Riffle Run Glide Beaver Pond Vatana Reservoir PRM 2: Riffle Run | 1 10 3 3 16 67 22 | 15 2 35 15 1 52 1 1 22 1 1 1 21 22 1 | 7 5 2 27 2 1 8 8 20 | 14 | 33 11 41 41 100 100 11 11 11 11 11 11 11 11 11 11 |
|--|--|-----------------------------|--|-------------------------------------|---|---|------------------------|---|
| UR-2 O: 234.5-248.6 O: | Slack River: Off-Channel Oshetna River Oshetna River: Off-Channel Susitna River Goose Creek | Side Slough Upper Extent W | Pool Riffle Run Pool Run Boulder Riffle Glide Percolation Channel Rapid Riffle Run Glide Beaver Pond Vatana Reservoir PRM 2. | 10 3 16 67 22 | 2 35 15 1 52 1 1 1 21 | 27 27 2 1 8 8 20 | 5 6 1 28 2 | 1 4 1 10 10 1 1 12 7 |
| UR-2 234.5-248.6 | Oshetna River Oshetna River: Off-Channel Susitna River Goose Creek | Side Slough Upper Extent W | Riffle Run Pool Run Boulder Riffle Glide Percolation Channel Rapid Riffle Run Glide Beaver Pond Vatana Reservoir PRM 2. | 10 3 16 67 22 | 35 15 1 52 1 1 1 21 | 27 27 2 1 8 8 20 | 28 2 2 | 1 4 1 10 10 1 1 12 7 |
| UR-2 234.5-248.6 | Oshetna River Oshetna River: Off-Channel Susitna River Goose Creek | Side Slough Upper Extent W | Pool Run Boulder Riffle Glide Percolation Channel Rapid Riffle Run Glide Beaver Pond //atana Reservoir PRM 2- | 16 67 22 | 15 1 52 1 1 21 22 | 27 27 2 1 8 8 20 | 28 2 | 10 10 11 12 7 |
| UR-2 234.5-248.6 | Oshetna River Oshetna River: Off-Channel Susitna River Goose Creek | Side Slough Upper Extent W | Run Boulder Riffle Glide Percolation Channel Rapid Riffle Run Glide Beaver Pond //atana Reservoir PRM 2. | 67 22 4 | 1 52 1 1 21 22 | 27 2 1 8 20 | 28 2 | 10 1 1 12 7 |
| UR-2 234.5-248.6 | Oshetna River Oshetna River: Off-Channel Susitna River Goose Creek | Side Slough Upper Extent W | Boulder Riffle Glide Percolation Channel Rapid Riffle Run Glide Beaver Pond //atana Reservoir PRM 2. | 67 22 4 | 1 52 1 1 21 22 | 27 2 1 8 20 | 24 | 10 1 1 12 7 |
| 234.5-248.6 | Oshetna River: Off-Channel Gusitna River Goose Creek | Upper Extent V | Glide Percolation Channel Rapid Riffle Run Glide Beaver Pond /atana Reservoir PRM 2. | 67 22 4 | 1 1 21 22 | 2 1 8 20 | 24 | 1 12 7 |
| 234.5-248.6 | Oshetna River: Off-Channel Gusitna River Goose Creek | Upper Extent V | Glide Percolation Channel Rapid Riffle Run Glide Beaver Pond /atana Reservoir PRM 2. | 67 22 4 | 1 1 21 22 | 2 1 8 20 | 24 | 1 12 7 |
| UR-3 Gi 224.9-234.5 Si Ja UR-4 | Gusitna River Goose Creek | Upper Extent V | Rapid Riffle Run Glide Beaver Pond /atana Reservoir PRM 2. Riffle | 67 22 4 | 1 21 22 | 8 20 | | 1 12 7 |
| UR-3 Gi 224.9-234.5 Si Ja UR-4 | Gusitna River Goose Creek | Upper Extent V | Rapid Riffle Run Glide Beaver Pond /atana Reservoir PRM 2. Riffle | 67 22 4 | 21 22 | 20 | | 1 12 7 |
| UR-3 Gi 224.9-234.5 Si Ja UR-4 | Gusitna River Goose Creek | Upper Extent V | Riffle Run Glide Beaver Pond /atana Reservoir PRM 2: Riffle | 22 | 22 | 20 | | 7 |
| UR-3 Gi 224.9-234.5 Si Ja UR-4 UR-4 | Gusitna River Goose Creek | Upper Extent V | Run Glide Beaver Pond /atana Reservoir PRM 2. Riffle | 4 | | | 15 1 | |
| UR-3 Gi 224.9-234.5 Si Ja UR-4 UR-4 | Gusitna River Goose Creek | Upper Extent V | Glide Beaver Pond /atana Reservoir PRM 2. Riffle | 4 | | | 1 | |
| UR-3 Gi 224.9-234.5 Si Ja UR-4 UR-4 | Gusitna River Goose Creek | Upper Extent V | Beaver Pond Vatana Reservoir PRM 2: Riffle | | | | - | |
| UR-3 G 224.9-234.5 Si Ja | Goose Creek | | Vatana Reservoir PRM 2 Riffle | | | | | |
| UR-3 G 224.9-234.5 Si Ja | Goose Creek | | Riffle | | | | | |
| UR-3 G 224.9-234.5 Si Ja | Goose Creek | Main Gramer | | | 1 | | 16 | 1 |
| 224.9-234.5 St Ja UR-4 | | | | | 10 | | 30 | 4 |
| 224.9-234.5 St Ja UR-4 | | | Boulder Riffle | | 394 | 192 | 67 | 65 |
| Si Ja Ko UR-4 | | | Pool | | 233 | 233 | 19 | 48 |
| Ja Ko UR-4 | | | Riffle | | | 13 | 12 | 6 |
| Ja Ko UR-4 | | | | | 39 147 | 113 | 40 | 30 |
| Ja Ko UR-4 | | Maia Obassal | Run | | | | | 2 |
| UR-4 | Susitna River | Main Channel | Run | | 5 | 6 | 18 | |
| UR-4 | | Split Main Channel | Run | | 7 | 1 | 13 | 2 |
| UR-4 | | Clearwater Plume | Clearwater Plume | 14 | 8 | 2 | 7 | 3 |
| UR-4 | lay Creek | | Pool | | 5 | 1 | 18 | 2 |
| UR-4 | | | Riffle | | 1 | 1 | | : |
| UR-4 | | | Run | | 11 | 1 | 4 | 1 |
| _ | Kosina Creek | | Boulder Riffle | 2 | 21 | 47 | 60 | 13 |
| _ | | | Glide | | | | 46 | 4 |
| 208.1-224.9 | | | Percolation Channel | 1 | | | | |
| | | | Pool | 78 | | | | 7 |
| | | | Rapid | 11 | | | | 1 |
| | | | Riffle | 67 | | | | 6 |
| | | | Run | | 2 | 1 | 3 | (|
| Ts | sisi Creek | | Boulder Riffle | | 70 | 2 | 17 | 8 |
| | | | Glide | 113 | | | | 113 |
| | | | Riffle | 22 | 53 | 6 | 7 | 8 |
| | | | Run | | 18 | 2 | | 2 |
| Ts | sisi Creek: Off-Channel | Side Slough | Percolation Channel | | 6 | 14 | 3 | 2 |
| JR-5 203.4-208.1 St | Susitna River | Main Channel | Run | | 1 | 1 | 17 | 19 |
| Sı | Susitna River | Main Channel | Run | | 2 | 21 | 96 | 119 |
| | | Side Channel | Pool | | 7 | 2 | 3 | 1: |
| | | | Riffle | | 1 | 1 | 3 | |
| | | Split Main Channel | Run | | 8 | 3 | 14 | 25 |
| Sı | Susitna River: Off-Channel | Side Slough | Pool | | 2 | | 1 | |
| Ur | Jnnamed Tributary 194.8 | | Pool | | 9 | | | |
| | • | | Run | | 7 | | | |
| UR-6 | Vatana Creek | | Boulder Riffle | | 43 | 15 | 24 | 8: |
| 187.1-203.4 | | İ | Pool | | 24 | 5 | | 2 |
| | | | Riffle | | 18 | 10 | 21 | 4 |
| | | | Run | | 35 | 51 | 26 | 11 |
| w | Vatana Creek Tributary | | Boulder Riffle | | 5 | 17 | 24 | 4 |
| <u> </u> | y | | Rapid | | J | 13 | 5 | 1 |
| - | | | Riffle | | 235 | 78 | 52 | 36 |
| <u> </u> | | | Run | | 235 | 27 | 56 | 30 |

Notes: All data are provisional and subject to ongoing QA/QC. Observations are reported within tributaries or mainstem geomorphic reach by habitat type by season: Spring (June 4-29), Early Summer (July 13-August 11), Late Summer (August 12-September 9), and Fall (September 10-October 4). Data sources include: Early-Life History sampling (ELH), GRTS tributary sampling (GRTS), direct tributary sampling (Direct), mainstem transect sampling (Transect), and visual observations.

431

1,818

952 818

4,019

Grand Total

Table D4. Upper River juvenile Arctic grayling observations by habitat, 2013.

| | T | Arctic grayl | ing, juvenile (<190m | m) | T | | | |
|-------------------------|----------------------------|--------------------|------------------------|--------|--------------|-------------|-------|-------------|
| Geomorphic Reach/PRM | Habitat | Macrohabitat | Mesohabitat | Spring | Early Summer | Late Summer | Fall | Grand Total |
| | Black River | | Boulder Riffle | | 13 | 5 | 7 | 25 |
| | | | Pool | 1 | | | | 1 |
| | | | Riffle | 7 | 2 | | 1 | 10 |
| | | | Run | 1 | 31 | 4 | 5 | 41 |
| | Black River: Off-Channel | Upland Slough | Pool | | 2 | | 1 | 3 |
| UR-2 | Oshetna River | | Boulder Riffle | | 20 | 13 | 9 | 42 |
| 234.5-248.6 | | | Glide | | | 1 | 2 | 3 |
| 20 110 2 1010 | | | Percolation Channel | | 1 | 1 | | 2 |
| | | | Rapid | 6 | | | | 6 |
| | | | Riffle | 57 | 18 | 8 | 16 | 99 |
| | | | Run | 19 | 8 | 2 | 6 | 35 |
| | Oshetna River: Off-Channel | Side Slough | Glide | | 1 | 1 | 1 | 3 |
| | | | Beaver Pond | 2 | | | | 2 |
| | 1 | | /atana Reservoir PRM 2 | 32.5 | 1 | | | |
| | Susitna River | Main Channel | Riffle | | 1 | | 10 | 11 |
| | | | Run | | 10 | | 5 | 15 |
| UR-3 | Goose Creek | | Boulder Riffle | | 267 | 148 | 56 | 471 |
| 224.9-234.5 | | | Pool | | 72 | 92 | 10 | 174 |
| | | | Riffle | | 31 | 9 | 10 | 50 |
| | 0 '' 0' | 14 : 01 | Run | | 82 | 21 | 17 | 120 |
| | Susitna River | Main Channel | Run | | 2 | | 7 | 9 |
| | | Split Main Channel | | 40 | 1 | 1 | 5 | 7 |
| | | Clearwater Plume | Clearwater Plume | 10 | 8 | 2 | 3 | 23 |
| | Jay Creek | | Pool | | 3 | 4 | 6 | 9 |
| | | | Riffle | | 1 | 1 | 3 | 5 |
| | Vasina Creak | | Run Boulder Riffle | 2 | 12 | 41 | 53 | 108 |
| | Kosina Creek | | | | 12 | 41 | 46 | 46 |
| UR-4 | | | Glide Pool | 35 | | | 40 | 35 |
| 208.1-224.9 | | | Rapid | 2 | | | | 2 |
| | | | Riffle | 48 | | | | 48 |
| | | | Run | 40 | 1 | | 1 | 2 |
| | Tsisi Creek | | Boulder Riffle | | 33 | 2 | 11 | 46 |
| | TSISI OICCK | | Glide | 72 | | | - ' ' | 72 |
| | | | Riffle | 1 | 38 | 4 | 5 | 48 |
| | | | Run | | 12 | 2 | Ů | 14 |
| | Tsisi Creek: Off-Channel | Side Slough | Percolation Channel | | 4 | 13 | 3 | 20 |
| UR-5 203.4-208.1 | Susitna River | Main Channel | Run | | | | 6 | 6 |
| | Susitna River | Main Channel | Run | | 2 | 3 | 21 | 26 |
| | | Side Channel | Pool | | 7 | 2 | 3 | 12 |
| | | | Riffle | | 1 | 1 | 2 | 4 |
| | | Split Main Channel | Run | | 8 | 2 | 8 | 18 |
| | Susitna River: Off-Channel | Side Slough | Pool | | 2 | | 1 | 3 |
| | Unnamed Tributary 194.8 | | Run | | 2 | | | 2 |
| UR-6 | Watana Creek | | Boulder Riffle | | 22 | 7 | 2 | 31 |
| 187.1-203.4 | | | Pool | | 4 | 4 | | 8 |
| | | | Riffle | | 7 | 2 | 19 | 28 |
| | | | Run | | 25 | 25 | 21 | 71 |
| | Watana Creek Tributary | | Boulder Riffle | | 5 | 11 | 10 | 26 |
| | | | Rapid | | | 5 | 2 | 7 |
| | | | Riffle | | 122 | 53 | 38 | 213 |
| | | | Run | | 135 | 14 | 38 | 187 |
| | | Proposed Watar | na Dam Location PRM 1 | 87.1 | | | | - |
| Grand Total | | | | 263 | 1,017 | 501 | 470 | 2,251 |

Table D5. Upper River juvenile or adult Arctic grayling observations by habitat, 2013.

Arctic grayling, juvenile or adult (190-328mm)

| | ı | Arctic graying, ju | venile or adult (190- | 32011111) | | | | |
|-------------------------|--------------------------|--------------------|------------------------|-----------|--------------|-------------|------|-------------|
| Geomorphic Reach/PRM | Habitat | Macrohabitat | Mesohabitat | Spring | Early Summer | Late Summer | Fall | Grand Total |
| | Black River | | Boulder Riffle | | 2 | 2 | 6 | 10 |
| | | | Riffle | | | | 4 | 4 |
| | | | Run | 2 | 4 | 1 | 1 | 8 |
| | Black River: Off-Channel | Upland Slough | Pool | _ | 8 | 2 | | 10 |
| UR-2 | | Topiania areagi: | Run | | 1 | _ | | 1 |
| 234.5-248.6 | Oshetna River | | Boulder Riffle | | 22 | 10 | 7 | 39 |
| | | 1 | Glide | | | 1 | · | 1 |
| | | 1 | Rapid | | 1 | | | 1 |
| | | 1 | Riffle | 5 | 1 | | 8 | 14 |
| | | 1 | Run | 3 | 12 | 4 | 7 | 26 |
| | | Unner Extent V | /atana Reservoir PRM 2 | | | | | |
| | Susitna River | Main Channel | Riffle | 1 | | | 6 | 6 |
| | Ousitila Kivei | Main Onannei | Run | | | | 9 | 9 |
| UR-3 | Goose Creek | | Boulder Riffle | | 96 | 41 | 9 | 146 |
| 224.9-234.5 | GOOSE GIEEK | | Pool | | 100 | 128 | 7 | 235 |
| 224.5-204.0 | | | Riffle | | 3 | 4 | 1 | 8 |
| | | + | Run | | 50 | 84 | 18 | 152 |
| | Susitna River | Main Channel | Run | 1 | 2 | 4 | 9 | 152 |
| | Susitiia Rivei | Split Main Channel | Run | | 3 | 4 | 4 | 7 |
| | | Clearwater Plume | Clearwater Plume | | 3 | | 2 | |
| | lau Craak | Clearwater Plume | | | 2 | | | 2 5 |
| | Jay Creek | | Pool | | 2 | | 3 | |
| | v · o · | | Run | | 4 | | 1 | 5 |
| | Kosina Creek | | Boulder Riffle | | 7 | 5 | 6 | 18 |
| UR-4 | | 1 | Pool | 36 | | | | 36 |
| 208.1-224.9 | | 1 | Rapid | 8 | | | | 8 |
| | | <u> </u> | Riffle | 15 | | | | 15 |
| | | | Run | | 1 | 1 | 1 | 3 |
| | Tsisi Creek | | Boulder Riffle | | 34 | | 6 | 40 |
| | | | Glide | 26 | | _ | | 26 |
| | | | Riffle | 20 | 14 | 2 | 2 | 38 |
| | | | Run | | 6 | | | 6 |
| | Tsisi Creek: Off-Channel | Side Slough | Percolation Channel | | 2 | 1 | | 3 |
| UR-5 203.4-208.1 | Susitna River | Main Channel | Run | | 1 | | 9 | 10 |
| | Susitna River | Main Channel | Run | | | 14 | | 58 |
| | | Side Channel | Riffle | | | | 1 | 1 |
| | | Split Main Channel | Run | | | | 3 | 3 |
| | Unnamed Tributary 194.8 | | Pool | | 7 | | | 7 |
| | | ļ | Run | | 5 | | | 5 |
| UR-6 | Watana Creek | | Boulder Riffle | | 14 | | 17 | 39 |
| 187.1-203.4 | | | Pool | | 13 | | | 14 |
| | | 1 | Riffle | | 11 | 7 | | 20 |
| | | 1 | Run | | 10 | | | 33 |
| | Watana Creek Tributary | | Boulder Riffle | | | 5 | 10 | 15 |
| | | | Rapid | | | 7 | 3 | 10 |
| | | | Riffle | | 93 | 21 | 13 | 127 |
| | | | Run | | 79 | 12 | 18 | 109 |
| | | Proposed Wata | na Dam Location PRM 1 | 187.1 | | | | |
| Grand Total | | | | 115 | 608 | 384 | 241 | 1,348 |

Table D6. Upper River adult Arctic grayling observations by habitat, 2013.

Arctic grayling, adult (>328 mm)

| | | Arctic gray | /ling, adult (>328 mm | 1) | | | | |
|------------------|---------------------------|--------------------|------------------------|----------|--------------|-------------|--------------|--------------------|
| Geomorphic | | | | | | | | |
| Reach/PRM | Habitat | Macrohabitat | Mesohabitat | Spring | Early Summer | Late Summer | Fall | Grand Total |
| | Black River | | Boulder Riffle | | | | 1 | 1 |
| | | | Riffle | 3 | | | | 3 |
| | Black River: Off-Channel | Upland Slough | Pool | | 5 | | | 5 |
| UR-2 | | 12 | 26 | | | | | |
| 234.5-248.6 | | | Rapid | 10 | | | | 10 |
| | | | Riffle | 5 | 2 | | | 7 |
| | | | Run | | 2 | 14 | 2 | 18 |
| | Oshetna River: Off-Channe | | Beaver Pond | 2 | | | | 2 |
| | - | Upper Extent V | Vatana Reservoir PRM 2 | 32.5 | _ | | | |
| | Susitna River | Main Channel | Run | | | | 16 | 16 |
| UD 2 | Goose Creek | | Boulder Riffle | | 26 | 3 | 2 | 31 |
| UR-3 | | | Pool | | 61 | 13 | 2 | 76 |
| 224.9-234.5 | | | Riffle | | 5 | | 1 | 6 |
| | | | Run | | 12 | 8 | 5 | 25 |
| | Susitna River | Main Channel | Run | | 1 | 2 | 2 | 5 |
| | | Split Main Channel | Run | | 3 | | 4 | 7 |
| | | Clearwater Plume | Clearwater Plume | 4 | | | 2 | 6 |
| | Jay Creek | | Pool | | | 1 | 9 | |
| | | | Run | | 6 | | | 6 |
| | Kosina Creek | | Boulder Riffle | | 2 | 1 | 1 | 4 |
| UR-4 | | | Percolation Channel | 1 | | | | 1 |
| 208.1-224.9 | | | Pool | 7 | | | | 7 |
| | | | Rapid | 1 | | | | 1 |
| | | | | 4 | | | | 4 |
| | | | | | | | 1 | 1 |
| | Tsisi Creek | | | | 3 | | | 3 |
| | | | | 15 | | | | 15 |
| | | | | 1 | 1 | | | 2 |
| UR-5 203.4-208.1 | Susitna River | Main Channel | | | | 1 | 2 | 3 |
| | Susitna River | | | | | 4 | 31 | 35 |
| | | Split Main Channel | | | | 1 | 3 | |
| | Unnamed Tributary 194.8 | | | | 2 | | Ť | 2 |
| | • | | | | 7 | | 5 | |
| | | | | | 7 | | | 7 |
| UR-6 | | | Riffle | † | · | 1 | | 1 |
| 187.1-203.4 | | | Run | | | 7 | 1 | 8 |
| | Watana Creek Tributary | | Boulder Riffle | | | 1 | 4 | 5 |
| | | | Rapid | | | 1 | <u> </u> | 1 |
| | | | Riffle | | 20 | 4 | 1 | 25 |
| | | | Run | | 10 | | - | 11 |
| | <u> </u> | Proposed Wata | na Dam Location PRM 1 | 187.1 | 10 | ' | <u> </u> | |
| Grand Total | | Troposed Wata | Dam Eddadon i Kini | 53 | 185 | 67 | 107 | 412 |
| Jiana i Jiai | | | | - 33 | 103 | U/ | 101 | 712 |

Table D7. Upper River burbot observations by habitat, 2013.

Burbot

| Geomorphic | | | | | | | | |
|------------------|--------------------------|--------------------|------------------------|--------|--------------|-------------|------|--------------------|
| Reach/PRM | Habitat | Macrohabitat | Mesohabitat | Spring | Early Summer | Late Summer | Fall | Grand Total |
| | Black River | | Boulder Riffle | | 1 | 2 | 3 | 6 |
| | | | Riffle | 1 | | | | 1 |
| | | | Run | 2 | | 1 | 3 | 6 |
| UR-2 | Black River: Off-Channel | Upland Slough | Run | | 1 | | 2 3 | 1 |
| 234.5-248.6 | Oshetna River | | Boulder Riffle | | 1 | | 1 | 2 |
| 234.3-240.0 | | | Glide | | 1 | 2 | | 3 |
| | | | Percolation Channel | 1 | | | | 1 |
| | | | Riffle | | | | 4 | 4 |
| | | | Run | 1 | 3 | 1 | 3 | 8 |
| | | Upper Extent W | atana Reservoir PRM 23 | 32.5 | | • | | • |
| UR-3 | Susitna River | Main Channel | Riffle | | 2 | 3 | 1 | 6 |
| 224.9-234.5 | | | Run | | 2 | 1 | 3 | 6 |
| | Susitna River | Main Channel | Run | | 5 | 5 | 14 | 24 |
| UR-4 | | Split Main Channel | Run | | 3 | | | 3 |
| 208.1-224.9 | | Clearwater Plume | Clearwater Plume | 1 | 3 | 6 | 9 | 19 |
| 200.1-224.9 | Jay Creek | | Pool | | 1 | | 2 | 3 |
| | Kosina Creek | | Riffle | 1 | | | | 1 |
| UR-5 203.4-208.1 | Susitna River | Main Channel | Run | | 6 | | | 6 |
| | Susitna River | Main Channel | Run | | 1 | 8 | 1 | 10 |
| UR-6 | | Side Channel | Pool | | 1 | | | 1 |
| 187.1-203.4 | | | Riffle | | 1 | | 1 | 2 |
| | | Split Main Channel | Run | | 3 | | | 3 |
| | • | Proposed Wata | na Dam Location PRM 1 | 87.1 | • | • | | |
| Grand Total | | | | 7 | 35 | 29 | 45 | 116 |

Table D8. Upper River Dolly Varden observations by habitat, 2013.

Dolly Varden

| Geomorphic | | | | | | | | |
|-------------|-------------------------------------|-----------------|------------------------|--------|--------------|-------------|------|--------------------|
| Reach/PRM | Habitat | Macrohabitat | Mesohabitat | Spring | Early Summer | Late Summer | Fall | Grand Total |
| | | Upper Extent Wa | atana Reservoir PRM 23 | 2.5 | | | | |
| | Jay Creek | | Pool | | 69 | | 17 | 86 |
| UR-4 | | | Run | | 43 | 1 | 7 | 51 |
| 208.1-224.9 | Kosina Creek | | Pool | 1 | | | | 1 |
| 208.1-224.9 | | | Riffle | 2 | | | | 2 |
| | Unnamed Tributary 194.8 | | Pool | | 2 | 5 | 10 | 17 |
| | | | Riffle | | 9 | 3 | | 12 |
| UR-6 | | | Run | | 15 | 21 | 6 | 42 |
| | Watana Creek | | Boulder Riffle | | 23 | 8 | 1 | 32 |
| | | | Pool | | 187 | 2 | 1 | 190 |
| | | | Riffle | | 84 | 13 | 12 | 109 |
| 187.1-203.4 | | | Run | | 68 | 44 | 6 | 118 |
| 107.1-203.4 | Watana Creek: Off-Channel | Side Slough | Glide | | 4 | 5 | 3 | 12 |
| | | | Percolation Channel | | | 1 | | 1 |
| | Watana Creek Tributary | | Rapid | | | 1 | | 1 |
| | | | Riffle | | 12 | 26 | 11 | 49 |
| | | | Run | | 5 | 1 | | 6 |
| | Watana Creek Tributary: Off-channel | Side Slough | Glide | | 2 | | | 2 |
| | | Proposed Watan | a Dam Location PRM 18 | 37.1 | | | | , |
| Grand Total | | | | 3 | 523 | 131 | 74 | 731 |

Notes: All data are provisional and subject to ongoing QA/QC. Observations are reported within tributaries or mainstem geomorphic reach by habitat type by season: Spring (June 4-29), Early Summer (July 13-August 11), Late Summer (August 12-September 9), and Fall (September 10-October 4). Data sources include: Early-Life History sampling (ELH), GRTS tributary sampling (GRTS), direct tributary sampling (Direct), mainstem transect sampling (Transect), and visual observations.

Table D9. Upper River lake trout observations by habitat, 2013.

Lake trout

| Geomorphic | | | | | | | | | | |
|---|--|--------------|-------------|------|--------------------|--|--|--|--|--|
| Reach/PRM | Habitat | Macrohabitat | Mesohabitat | Fall | Grand Total | | | | | |
| Upper Extent Watana Reservoir PRM 232.5 | | | | | | | | | | |
| UR-6 / 187.1-203.4 | Watana Creek Tributary | | Riffle | 1 | 1 | | | | | |
| | Proposed Watana Dam Location PRM 187.1 | | | | | | | | | |
| Grand Total | | | | 1 | 1 | | | | | |

Table D10. Upper River longnose sucker observations by habitat, 2013.

Longnose sucker

| Geomorphic | | | | | | | | |
|-------------|----------------------------|--------------------|----------------------|---------|--------------|-------------|------|--------------------|
| Reach/PRM | Habitat | Macrohabitat | Mesohabitat | Spring | Early Summer | Late Summer | Fall | Grand Total |
| | Black River | | Run | | | 1 | | 1 |
| UR-2 | Oshetna River | | Boulder Riffle | | | | 1 | 1 |
| 234.5-248.6 | | | Run | 3 | 1 | | | 4 |
| | | Upper Extent | Watana Reservoir PRI | A 232.5 | | | | |
| | Susitna River | Main Channel | Riffle | | | | 1 | 1 |
| UR-3 | | | Run | | | 3 | | 3 |
| 224.9-234.5 | Goose Creek | | Boulder Riffle | | 4 | | | 4 |
| 224.3-234.3 | | | Pool | | 1 | 1 | | 2 |
| | | | Run | | 1 | | | 1 |
| | Susitna River | Main Channel | Run | | | | 2 | 2 |
| UR-4 | | Split Main Channel | Run | | 2 | | | 2 |
| 208.1-224.9 | | Clearwater Plume | Clearwater Plume | 2 | 2 | 2 | 5 | 11 |
| | Kosina Creek | | Riffle | 9 | | | | 9 |
| | Susitna River | Main Channel | Run | | 10 | 9 | | 19 |
| | | Side Channel | Pool | | 6 | 2 | 2 | 10 |
| UR-6 | | | Riffle | | 11 | | 15 | 26 |
| 187.1-203.4 | | Split Main Channel | Run | | 10 | 14 | | 24 |
| 107.1-203.4 | Susitna River: Off-Channel | Side Slough | Pool | | 4 | 10 | 2 | 16 |
| | Unnamed Tributary 194.8 | | Run | | 1 | | | 1 |
| | Watana Creek | | Boulder Riffle | | 1 | | | 1 |
| | | Proposed Wat | ana Dam Location PR | M 187.1 | | | | |
| Grand Total | | | | 14 | 54 | 42 | 28 | 138 |

Table D11. Upper River sculpin observations by habitat, 2013.

| | | Sculpi | 1 | | | | | |
|-------------------------|-------------------------------------|-------------------------------------|---------------------|--|--------------|-------------|-------|-------------|
| Geomorphic Reach/PRM | Habitat | Macrohabitat | Mesohabitat | Spring | Early Summer | Late Summer | Fall | Grand Total |
| | Black River | | Boulder Riffle | | 177 | 92 | 71 | 340 |
| | | | Pool | 22 | | | | 22 |
| | | | Riffle | 90 | 35 | 34 | 13 | 172 |
| | | | Run | 26 | 214 | 95 | 70 | 405 |
| | Black River: Off-Channel | Upland Slough | Pool | | 5 | 51 | 33 | 89 |
| | | | Run | | 11 | 5 | 16 | 32 |
| UR-2 | Oshetna River | | Boulder Riffle | | 234 | 149 | 159 | 542 |
| 234.5-248.6 | | | Glide | | 51 | 6 | 8 | 65 |
| | | | Percolation Channel | | 4 | 4 | 12 | 20 |
| | | | Pool | | 44 | | 11 | 55 |
| | | | Rapid | 41 | 30 | 16 | 28 | 115 |
| | | | Riffle | 233 | 163 | 142 | 92 | 630 |
| | | | Run | 105 | 142 | 125 | 88 | 460 |
| | Oshetna River: Off-Channel | Side Slough | Glide | | 34 | 25 | 25 | 84 |
| | | Upper Extent Watana Re | | 1 | | | | |
| | Susitna River | Main Channel | Riffle | | 4 | 9 | 1 | 14 |
| | Outstand Naves | Main Chamio | Run | | 25 | 3 | 2 | 30 |
| UR-3 | Goose Creek | | Boulder Riffle | | 120 | 47 | 25 | 192 |
| 224.9-234.5 | | | Pool | | 2 | 2 | 6 | 102 |
| 117.0 207.0 | | | Riffle | | 15 | 7 | 10 | 32 |
| | | | Run | | 27 | 7 | 13 | 47 |
| | Sualtra Divar | Main Channel | | | | 17 | 24 | 49 |
| | Susitna River | | Run | | 8 | | | |
| | | Split Main Channel | Run | _ | 5 | 2 | 13 | 20 |
| | | Clearwater Plume | Clearwater Plume | 5 | | 10 | 31 | 63 |
| | Jay Creek | | Pool | | 5 | 1 | | 6 |
| | | | Riffle | | 13 | 3 | 4 | 20 |
| | | | Run | | 6 | | 5 | 11 |
| | Kosina Creek | | Boulder Riffle | 23 | 40 | 63 | 63 79 | 205 |
| UR-4 | | | Glide | 27 | | | 20 | 47 |
| 208.1-224.9 | | | Percolation Channel | 11 | | | | 11 |
| 200.1 224.0 | | | Rapid | 4 | | | | 4 |
| | | | Riffle | 71 | 19 | 10 | 47 | 147 |
| | | | Run | | 1 | 16 | 16 | 33 |
| | Tsisi Creek | | Boulder Riffle | | 38 | 14 | 40 | 92 |
| | | | Glide | 160 | | | | 160 |
| | | | Riffle | 1 | 72 | 41 | 46 | 160 |
| | | | Run | | 34 | 35 | 6 | 75 |
| | Tsisi Creek: Off-Channel | Side Slough | Percolation Channel | | | 6 | 26 | 32 |
| UR-5 203.4-208.1 | Susitna River | Main Channel | Run | | 1 | 4 | 20 | 25 |
| | Susitna River | Main Channel | Run | | 17 | 34 | 15 | 66 |
| | | Side Channel | Pool | | 16 | 14 | 17 | 47 |
| | | | Riffle | | 2 | 12 | 9 | 23 |
| | | Split Main Channel | Run | | 8 | 21 | 23 | 52 |
| | Susitna River: Off-Channel | Side Slough | Pool | | 4 | 55 | 16 | 75 |
| | Unnamed Tributary 194.8 | S.as Glough | Pool | | 25 | 25 | 39 | 89 |
| | Omnumed Tributary 134.0 | | Riffle | | 3 | 1 | JJ | 4 |
| | | | Run | | 30 | 20 | 15 | 65 |
| ļ | Watana Crook | | | - | 21 | 42 | | |
| UD C | Watana Creek | | Boulder Riffle | | | | 9 | 72 |
| UR-6 | | | Pool | - | 9 | 2 | 2 | 13 |
| 187.1-203.4 | | | Riffle | - | 164 | 45 | 49 | 258 |
| | | a a | Run | | 80 | 74 | 66 | 220 |
| | Watana Creek: Off-Channel | Side Slough | Glide | | 1 | 3 | 2 | 6 |
| | | | Percolation Channel | | | 1 | | 1 |
| | | Side Slough Beaver Complex | Beaver Pond | | 1 | 4 | 3 | 8 |
| | Watana Creek Tributary | | Boulder Riffle | | 10 | 4 | | 14 |
| | | | Rapid | | | 5 | 5 | 10 |
| _ | | | Riffle | | 85 | 31 | 17 | 133 |
| | | i | Dun | | 1 | 8 | 3 | 12 |
| | | | Run | | | U | J | 14 |
| | Watana Creek Tributary: Off-channel | Side Slough | | | | | | 24 |
| | Watana Creek Tributary: Off-channel | Side Slough Proposed Watana Dam Lo | Glide | | 8 | 14 | 2 | |

Table D12. Upper River humpback whitefish observations by habitat, 2013.

Whitefish, humpback

| Geomorphic | | | | | | | | | |
|--|---|------------------|------------------|--------|--------------|--------------------|--|--|--|
| Reach/PRM | Habitat | Macrohabitat | Mesohabitat | Spring | Early Summer | Grand Total | | | |
| | Upper Extent Watana Reservoir PRM 232.5 | | | | | | | | |
| UR-2 234.5-248.6 | Oshetna River | | Riffle | 1 | | 1 | | | |
| UR-3 224.9-234.5 | Susitna River | Main Channel | Run | | 2 | 2 | | | |
| UR-4 | Susitna River | Clearwater Plume | Clearwater Plume | 1 | | 1 | | | |
| 208.1-224.9 | Kosina Creek | | Riffle | 1 | | 1 | | | |
| Proposed Watana Dam Location PRM 187.1 | | | | | | | | | |
| Grand Total | | | | 3 | 2 | 5 | | | |

Table D13. Upper River round whitefish observations by habitat, 2013.

Whitefish, round

| Geomorphic | | | elisii, louliu | | | | | |
|------------------|----------------------------|--------------------|--------------------|--------|--------------|-------------|------|-------------|
| Reach/PRM | Habitat | Macrohabitat | Mesohabitat | Spring | Early Summer | Late Summer | Fall | Grand Total |
| | Black River | | Boulder Riffle | | 1 | | | 1 |
| | | | Run | | 2 | | | 2 |
| UR-2 | Oshetna River | | Rapid | 1 | | | | 1 |
| 234.5-248.6 | | | Riffle | | | | 3 | 3 |
| | | | Run | 1 | | | | 1 |
| | • | Upper Extent Wa | tana Reservoir PRM | 232.5 | | | | |
| | Susitna River | Main Channel | Riffle | | | 1 | 1 | 2 |
| up a | | | Run | | | | 15 | 15 |
| UR-3 | Goose Creek | | Boulder Riffle | | 8 | 1 | | 9 |
| 224.9-234.5 | | | Pool | | 10 | 14 | | 24 |
| | | | Run | | 2 | 7 | | 9 |
| | Susitna River | Main Channel | Run | | | 4 | 6 | 10 |
| | | Split Main Channel | Run | | | 1 | 2 | 3 |
| UR-4 | | Clearwater Plume | Clearwater Plume | 1 | | | 6 | 7 |
| 208.1-224.9 | Kosina Creek | | Boulder Riffle | | 2 | | | 2 |
| 200.1-224.5 | | | Pool | 12 | | | | 12 |
| | Tsisi Creek | | Riffle | | 2 | | | 2 |
| | | | Run | | 2 | | | 2 |
| UR-5 203.4-208.1 | Susitna River | Main Channel | Run | | 1 | 2 | 10 | 13 |
| | Susitna River | Main Channel | Run | | 3 | 6 | 4 | 13 |
| | | Side Channel | Riffle | | 3 | | 3 | 6 |
| | | Split Main Channel | Run | | 4 | | 5 | 9 |
| | Susitna River: Off-Channel | Side Slough | Pool | | 1 | | | 1 |
| UR-6 | Watana Creek | | Boulder Riffle | | 3 | 1 | | 4 |
| 187.1-203.4 | | | Pool | | 3 | | | 3 |
| 107.1-203.4 | | | Riffle | | 7 | 1 | | 8 |
| | | | Run | | 2 | | | 2 |
| | Watana Creek Tributary | | Rapid | | | 1 | | 1 |
| | | | Riffle | | 4 | 1 | | 5 |
| | | | Run | | 1 | | | 1 |
| | | Proposed Watana | Dam Location PRM | | | | | |
| Grand Total | | | | 15 | 61 | 40 | 55 | 171 |

2. RELATIVE ABUNDANCE

As discussed in ISR Study 9.5, Section 4.4.2.2, catch per unit effort (CPUE) estimates were used to describe the relative abundance of fish species among habitats within the Upper River study area. Additional details concerning the calculation of CPUE are provided below, along with a summary of sampling effort (Table D15 through D18), gear-specific CPUE by species (Table D14), and gear-specific average CPUE by habitat type (Tables D19 through D43).

Catch per unit effort estimates were derived for each of the three types of Fish Distribution and Abundance protocols used in the Upper River: GRTS-sampling tributaries, direct-sampling tributaries, and mainstem Susitna River transects. The approach used to estimate CPUE was largely similar among each of these components. In all cases, CPUE was evaluated specific to gear type, species, and sampling event (i.e., early summer, late summer, or fall), and the analysis also distinguished between juvenile and adult life stages for Pacific salmon. Furthermore, the analysis conducted for each sampling component was specific to mesohabitat type. However, as a direct result of differences in the study design and site selection process among the sampling components, different analytical approaches were used to derive average CPUE values at the macrohabitat scale. Average CPUE values for each GRTS-sampled tributary represent the average CPUE among individual GRTS segments with a given tributary. For direct-sampling tributaries, average CPUE was calculated as the average among sampling reaches within a given tributary. In the mainstem Susitna River, the mesohabitat-specific CPUE estimates were averaged among macrohabitat units within each geomorphic reach. In the analysis that follows, these differences are discussed when relevant to the calculations being described.

At the mesohabitat unit level, CPUE was calculated as follows for each gear type, species, life stage, and sampling event combination:

 $CPUE_{Meso} = C_{Meso}/E_{Meso}$,

where $CPUE_{Meso}$ = catch per unit effort for a given mesohabitat unit,

 C_{Meso} = total fish captured within a given mesohabitat unit, and

 E_{Meso} = total effort within a given mesohabitat unit.

For backpack and boat electrofishing, E_{Meso} was recorded as the electrofishing pulse duration in seconds, and for reporting purposes was expressed in hours. That is,

 E_{Meso} = pulse duration in seconds × (1 minute/60 seconds) × (1 hour/60 minutes) = pulse duration in hours.

For snorkeling and seining, E_{Meso} was calculated by determining the total area sampled at a given mesohabitat unit. Specifically,

 E_{Meso} = length of area sampled in meters × width of area sampled in meters = area sampled in square meters.

For snorkeling and seining, $CPUE_{Meso}$ estimates were then standardized to 1,000 m² using a factor of 1,000.

When sampling within a GRTS segment, a direct sampling reach, or a mainstem macrohabitat site included multiple mesohabitat units of the same type (e.g., two distinct pools), the associated $CPUE_{Meso}$ values were calculated using the total catch and the total effort across mesohabitat units. For example,

$$CPUE_{Meso} = (C_{Meso1} + C_{Meso2} + ... + C_{Meson})/(E_{Meso1} + E_{Meso2} + ... + E_{Meson})$$

After determining CPUE_{Meso} values for a given mesohabitat type, the average CPUE was calculated as:

$$CPUE_{Ava} = (\Sigma CPUE_{Meso})/N$$
,

where N = sample size.

Specific definitions for N vary among the three sampling components. For GRTS-sampled tributaries,

 $N_{m,g,e}$ = number of GRTS segments within a given tributary containing mesohabitat type "m" that was sampled using gear type "g" during sampling event "e".

For direct sampling tributaries,

 $N_{m,g,e}$ = number of sampling reaches within a given tributary containing mesohabitat type "m" that was sampled using gear type "g" during sampling event "e".

For mainstem transect sampling, average CPUE estimates for each mesohabitat type were calculated specific to mainstem macrohabitat types within each geomorphic reach. In this case,

 $N_{M,m,g,e}$ = number of macrohabitat units of type "M" within a given geomorphic reach containing mesohabitat type "m" that was sampled using gear type "g" during sampling event "e".

Actual sample sizes and the total effort supporting gear-specific average CPUE values are provided in Tables D15 through D18.

Table D14. Summary of relative abundance by capture method for main channel, off-channel, and tributary habitats of the Upper River, 2013.

| | | М | ain Chann | el | Off-Ch | annel | | Tributary | | All |
|-----------------------------|----------|--|--|---|---|---|---|---|--|---|
| Species | | Backpack Electrofishing (N=60; CPUE in fish/hour) | Boat Electrofishing (N=47; CPUE in fish/hour) | Seine (N=13; CPUE in fish/1,000 m^2) | Backpack Electrofishing (N=3; CPUE in fish/hour) | Boat Electrofishing (N=3; CPUE in fish/hour) | Backpack Electrofishing (N=396, CPUE in fish/hour) | Snorkel (N=172; CPUE in fish/1,000 m^2) | Seine (N=4; CPUE in fish/1,000 m^2) | Percent of Sites with CPUE=0 (N=472; all methods) |
| Salmon, juvenile Chinook | % CPUE=0 | 100% | 100% | 100% | 100% | 100% | 94% | 98% | 100% | 95% |
| | Max CPUE | | | | | • | 160 | 31.4 | | |
| Arctic grayling | % CPUE=0 | 50% | 64% | 38% | 33% | 100% | 49% | 40% | 100% | 41% |
| | Max CPUE | 86.9 | 226.3 | 21.7 | 9.9 | | 253.1 | 1500 | | |
| Burbot | % CPUE=0 | 70% | 77% | 92% | 100% | 100% | 96% | 100% | 100% | 90% |
| | Max CPUE | 32.4 | 12.2 | 0.7 | | | 34.1 | | | |
| Dolly Varden | % CPUE=0 | 100% | 100% | 100% | 100% | 100% | 88% | 88% | 100% | 88% |
| | Max CPUE | | | | | | 453.3 | 330 | | |
| Longnose sucker | % CPUE=0 | 78% | 94% | 38% | 33% | 67% | 98% | 97% | 100% | 93% |
| | Max CPUE | 24.1 | 11.9 | 47.2 | 9.9 | 5.6 | 12 | 11 | | |
| Sculpin, undifferentiated | % CPUE=0 | 25% | 91% | 62% | 0% | 100% | 20% | 93% | 100% | 22% |
| · | Max CPUE | 162.4 | 7.3 | 10.9 | 59 | | 363 | 100 | | |
| Trout, lake | % CPUE=0 | 100% | 100% | 100% | 100% | 100% | >99% | 100% | 100% | >99% |
| | Max CPUE | | | | | | 18.5 | | | |
| Whitefish, round | % CPUE=0 | 83% | 68% | 54% | 67% | 100% | 98% | 88% | 100% | 88% |
| | Max CPUE | 40.8 | 22.3 | 5.1 | 5 | | 46.2 | 69 | | |
| Whitefish, undifferentiated | % CPUE=0 | 100% | 100% | 100% | 100% | 100% | 100% | 99% | 100% | >99% |
| | Max CPUE | | | | | | | 0.5 | | |
| Percent of Sites with No | Fish | 17% | 47% | 23% | 0% | 67% | 10% | 31% | 100% | |

Notes: All data are provisional and subject to ongoing QA/QC. CPUE was calculated within tributaries or mainstem geomorphic reach as an average among sites by habitat type by season: Early Summer (July 13-August 11), Late Summer (August 12-September 9), and Fall (September 10-October 4). Data sources include: GRTS tributary sampling, direct tributary sampling, and mainstem transect sampling.

Table D15. Sample sizes and total effort used for calculating average CPUE for backpack electrofishing in the Upper River, 2013.

| Geo- | | Macro- | Meso- | Sa | ample Size (| N) | (pulse d | Total Effort luration in s | | |
|------------------|---------------------------|--------------------------|------------------------|---------------------|----------------|-------|-----------------|-------------------------------|------|------|
| morphic Reach | Stream | habitat Type | habitat Type | Early Summer | Late Summer | Fall | Early Summer | Late Summer | Fall | |
| | | | Boulder Riffle | 7 | 7 | 7 | 3087 | 2735 | 3550 | |
| | | | Glide | 2 | 2 | 2 | 628 | 490 | 852 | |
| | Oshetna | Tributary | Percolation Channel | 1 | 1 | 1 | 305 | 191 | 189 | |
| UR-2 | River | | Pool | 1 | | 1 | 301 | | 247 | |
| (PRM | | | Rapid | 1 | 1 | 1 | 320 | 250 | 370 | |
| 234.5- | | | Riffle | 5 | 5 | 5 | 2513 | 1540 | 2470 | |
| 248.6) | | | Run | 7 | 7 | 7 | 2913 | 2707 | 3332 | |
| | | Black River Tributary | Boulder Riffle | 4 | 4 | 4 | 1763 | 1298 | 1581 | |
| | | | Pool | 1 | 1 | 1 | 328 | 256 | 455 | |
| River | er industry | Riffle | 1 | 1 | 1 | 316 | 313 | 261 | | |
| | | | Run | 3 | 3 | 3 | 1748 | 1382 | 1767 | |
| | | | Watana Res | ervoir at Full | Pool (PRM 2 | 32.5) | | | | |
| | Susitna | Main | Riffle | 1 | 1 | 1 | 580 | 794 | 556 | |
| | River | Channel | Run | 1 | 1 | 1 | 800 | 988 | 441 | |
| UR-3 (PRM | | | Boulder Riffle | 19 | 18 | 17 | 9120 | 5880 | 6597 | |
| 224.9- | Goose | Tributary | Pool | 4 | 4 | 4 | 812 | 873 | 1283 | |
| 234.5) | Creek | | Riffle | 3 | 3 | 4 | 834 | 670 | 923 | |
| | | | Run | 6 | 7 | 6 | 1945 | 2562 | 2109 | |
| | | | Clearwater Plume | Clearwater Plume | 3 | 3 | 2 | 1643 | 1780 | 2250 |
| | Susitna River | Main Channel | Run | 4 | 4 | 5 | 2892 | 2559 | 3438 | |
| | | Split Main Channel | Run | 1 | 1 | 1 | 939 | 904 | 902 | |
| | lau | | Pool | 1 | 2 | 2 | 587 | 522 | 641 | |
| | Jay Creek ¹ | Tributary | Riffle | 1 | 1 | 1 | 224 | 117 | 85 | |
| UR-4 | Orook | | Run | 2 | 2 | 2 | 363 | 690 | 380 | |
| (PRM 208.1- | | | Boulder Riffle | 4 | 4 | 4 | 2152 | 2408 | 2829 | |
| 224.9) | Kosina | Tributary | Glide | | | 1 | | | 163 | |
| | Creek | , | Riffle | 2 | 2 | 2 | 845 | 851 | 1006 | |
| | | | Run | 1 | 2 | 2 | 510 | 701 | 673 | |
| | | | Boulder Riffle | 2 | 2 | 2 | 933 | 865 | 1040 | |
| | Tsisi Creek | Tributary | Percolation Channel | 1 | 1 | 1 | 498 | 678 | 256 | |
| | JIOOK | | Riffle | 4 | 4 | 4 | 1148 | 1528 | 1719 | |
| | | | Run | 2 | 2 | 1 | 526 | 794 | 395 | |

Table D15. Continued.

| 0 | | Maara | Meso- | Sa | mple Size (| M) | | Total Effort uration in s | |
|----------------------------------|--------------------|---------------------------|------------------------|-----------------|----------------|--------|-----------------|------------------------------|------|
| Geo- morphic Reach | Stream | Macro- habitat Type | habitat Type | Early Summer | Late Summer | Fall | Early Summer | Late Summer | Fall |
| UR-5 (PRM 203.4- 208.1) | Susitna River | Main Channel | Run | 2 | 2 | 2 | 1404 | 1474 | 1128 |
| | | Main Channel | Run | 4 | 4 | 4 | 2361 | 2695 | 2165 |
| | | Side | Pool | 1 | 1 | 1 | 747 | 606 | 755 |
| | Susitna | Channel | Riffle | 1 | 1 | 1 | 527 | 738 | 585 |
| Riv | River | Side Slough | Pool | 1 | 1 | 1 | 725 | 1098 | 669 |
| | | Split Main Channel | Run | 2 | 2 | 2 | 1377 | 1129 | 1024 |
| | | | Beaver Pond | 1 | 1 | 2 | 180 | 316 | 478 |
| | Matana | Tributary | Boulder Riffle | 3 | 3 | 3 | 1225 | 861 | 1053 |
| | | | Glide | 1 | 1 | 1 | 174 | 564 | 212 |
| UR-6 (PRM | Watana Creek | | Percolation Channel | 1 | 1 | 1 | 100 | 76 | 137 |
| 187.1- 203.4) | | | Pool | 1 | 3 | 1 | 175 | 614 | 250 |
| 203.4) | | | Riffle | 8 | 8 | 8 | 2954 | 2518 | 2043 |
| | | | Run | 10 | 9 | 10 | 2960 | 3647 | 3145 |
| | | | Boulder Riffle | 2 | 2 | 1 | 551 | 458 | 128 |
| | Watana | T.21 (c.) | Glide | 1 | 1 | 1 | 298 | 454 | 110 |
| | Creek Tributary | Tributary | Rapid | | 2 | 1 | | 385 | 367 |
| | Tributary | | Riffle | 12 | 10 | 10 | 4235 | 3939 | 3229 |
| | | | Run | 3 | 2 | 3 | 546 | 325 | 530 |
| | Unnamed | | Pool | 2 | 2 | 2 | 666 | 907 | 724 |
| | Tributary | Tributary | Riffle | 1 | 1 | 1 | 317 | 320 | 186 |
| 194.8 | | | Run | 1 | | 1 | 574 | | 467 |
| | | | Proposed Wata | ana Dam Lo | cation (PRM | 187.1) | | | |

^{1.} Jay Creek was a direct-sampling tributary in which non-random site selection was used. See ISR Study 9.5 Section 4.4.2.2 for details. Notes: All data are provisional and subject to ongoing QA/QC. CPUE was calculated within tributaries or mainstem geomorphic reach as an average among sites by habitat type by season: Early Summer (July 13-August 11), Late Summer (August 12-September 9), and Fall (September 10-October 4). Data sources include: GRTS tributary sampling, direct tributary sampling, and mainstem transect sampling.

Table D16. Sample sizes and total effort used for calculating average CPUE for boat electrofishing in the Upper River, 2013.

| | | | Sample Size (N) | | N) | | Total Effort uration in s | | | |
|-------------------------------|--|---------------------|-----------------|----------------|--------|-----------------|------------------------------|------|--|--|
| Geomorphic Reach | Macrohabitat Type | Mesohabitat Type | Early Summer | Late Summer | Fall | Early Summer | Late Summer | Fall | | |
| | | Watana Rese | ervoir at Full | Pool (PRM | 232.5) | | | | | |
| UR-3 | | Riffle | 1 | 1 | 1 | 169 | 184 | 309 | | |
| (PRM 224.9- 234.5) | Main Channel | Run | 1 | 1 | 1 | 310 | 123 | 695 | | |
| UR-4 | Clearwater Plume | Clearwater Plume | | 1 | 1 | | 127 | 909 | | |
| (PRM 208.1- | Main Channel | Run | 5 | 5 | 5 | 3493 | 1374 | 3216 | | |
| 224.9) | Split Main Channel | Run | 1 | 1 | 1 | 912 | 273 | 495 | | |
| UR-5 (PRM 203.4- 208.1) | Main Channel | Run | 2 | 2 | 2 | 1899 | 520 | 1731 | | |
| LID C | Main Channel | Run | 4 | 4 | 4 | 3325 | 3320 | 2360 | | |
| UR-6 (PRM 187.1- | Side Slough | Pool | 1 | 1 | 1 | 645 | 401 | 439 | | |
| 203.4) | Split Main Channel | Run | 1 | 1 | 1 | 477 | 382 | 485 | | |
| | Proposed Watana Dam Location (PRM 187.1) | | | | | | | | | |

Notes: All data are provisional and subject to ongoing QA/QC. CPUE was calculated within mainstem geomorphic reach as an average among sites by habitat type by season: Early Summer (July 13-August 11), Late Summer (August 12-September 9), and Fall (September 10-October 4). Data sources include: mainstem transect sampling.

Table D17. Sample sizes and total effort used for calculating average CPUE for seining in the Upper River, 2013.

| Geo- | | | | Meso- Sample Size (N) | | | Total Effort (area sampled in square meters) | | | |
|----------------------------------|--|------------------------|-----------------|-----------------------|----------------|--------|--|----------------|------|--|
| morphic Reach | Stream | Macro- habitat Type | habitat Type | Early Summer | Late Summer | Fall | Early Summer | Late Summer | Fall | |
| UR-2 | _ | | Pool | 1 | | | 21 | | | |
| (PRM | Oshetna | Tributary | Riffle | 1 | | | 147 | | | |
| 234.5- 248.6) | River | | Run | 1 | | | 700 | | | |
| | | | Watana Res | ervoir at Ful | Pool (PRM | 232.5) | | | | |
| UR-4 (PRM 208.1- 224.9) | Susitna River | Main Channel | Run | 2 | | | 375 | | | |
| | | Main Channel | Run | 1 | 1 | 1 | 1400 | 600 | 780 | |
| LID 6 | Cuaitaa | Cide Observed | Pool | 1 | 1 | 1 | 900 | 92 | 150 | |
| UR-6 (PRM | Susitna River | Side Channel | Riffle | 1 | | 1 | 212 | | 390 | |
| 187.1- 203.4) | | Split Main Channel | Run | 1 | 1 | 1 | 1530 | 960 | 475 | |
| , | Watana Creek | Tributary | Riffle | 1 | | | 240 | | | |
| | Proposed Watana Dam Location (PRM 187.1) | | | | | | | | | |

Notes: All data are provisional and subject to ongoing QA/QC. CPUE was calculated within tributaries or mainstem geomorphic reach as an average among sites by habitat type by season: Early Summer (July 13-August 11), Late Summer (August 12-September 9), and Fall (September 10-October 4). Data sources include: GRTS tributary sampling and mainstem transect sampling.

Table D18. Sample sizes and total effort used for calculating average CPUE for snorkeling in the Upper River, 2013.

| 000 | | | S | ample Size (A | n | (area san | Total Effort npled in square | meters) |
|--------------------------|---------------------------|------------------------|-----------------|-------------------|--------------|-----------------|------------------------------|---------|
| Geo- morphic Reach | Stream | Mesohabitat Type | Early Summer | Late Summer | Fall | Early Summer | Late Summer | Fall |
| | | | Watana Rese | ervoir at Full Po | ool (PRM 232 | 2.5) | | |
| UR-3 | | Boulder Riffle | 8 | 8 | 7 | 6396 | 8363 | 8647 |
| (PRM 224.9- | Goose Creek | Pool | 4 | 3 | 2 | 2193 | 1121 | 1596 |
| 224.9- 234.5) | Creek | Riffle | 1 | | 1 | 10 | | 32 |
| 201.0) | | Run | 5 | 6 | 4 | 2021 | 2737 | 3684 |
| | Jay | Pool | 1 | 1 | 1 | 345 | 400 | 475 |
| | Creek ¹ Kosina | Run | 1 | 1 | 1 | 400 | 1039 | 500 |
| | | Boulder Riffle | 4 | 4 | 3 | 4145 | 9900 | 7500 |
| UR-4 | Creek | Glide | | | 1 | | | 140 |
| (PRM | | Run | | 1 | 1 | | 3900 | 3000 |
| 208.1- 224.9) | Tsisi Creek | Boulder Riffle | 2 | 1 | 2 | 2700 | 2600 | 2000 |
| | | Percolation Channel | 1 | 1 | 1 | 280 | 760 | 50 |
| | | Riffle | 4 | 3 | 4 | 4375 | 3000 | 3100 |
| | | Run | 2 | 1 | 1 | 3400 | 2500 | 1000 |
| | | Beaver Pond | 1 | 1 | 1 | 1000 | 1250 | 1500 |
| | Watana | Boulder Riffle | 2 | 2 | 1 | 2020 | 3300 | 2000 |
| | Creek | Pool | 3 | 3 | 3 | 975 | 941 | 1220 |
| | | Riffle | 3 | 2 | 4 | 2750 | 1500 | 4300 |
| UR-6 | | Run | 6 | 6 | 4 | 5600 | 5610 | 3900 |
| (PRM 187.1- | Watana | Boulder Riffle | | 1 | 2 | | 200 | 435 |
| 203.4) | Creek | Rapid | | 1 | 1 | | 300 | 1030 |
| | Tributary | Riffle | 8 | 4 | 5 | 4348 | 2290 | 3875 |
| | | Run | 3 | 2 | 3 | 640 | 300 | 1750 |
| | Unnamed | Pool | 2 | 2 | | 325 | 450 | |
| | Tributary | Riffle | 1 | 1 | | 150 | 200 | |
| | 194.8 | Run | 1 | 1 | | 190 | 300 | |

^{1.} Jay Creek was a direct-sampling tributary in which non-random site selection was used. See ISR Study 9.5 Section 4.4.2.2 for details. Notes: All data are provisional and subject to ongoing QA/QC. CPUE was calculated within tributaries as an average among sites by habitat type by season: Early Summer (July 13-August 11), Late Summer (August 12-September 9), and Fall (September 10-October 4). Data sources include: GRTS tributary sampling and direct tributary sampling.

Table D19. Average CPUE (fish per hour of shocking time) for Chinook salmon using backpack electrofishing in the Upper River, 2013.

| Geo- | | | | Salmon | ı, Chinook (juv | renile) |
|------------------|------------------------|--------------------|---------------------------------|-----------------|-----------------|---------|
| morphic Reach | Stream | Macrohabitat Type | Mesohabitat Type | Early Summer | Late Summer | Fall |
| | | | Boulder Riffle | 2.3 | 0 | 0 |
| | | | Glide | 0 | 0 | 0 |
| | | | Percolation Channel | 0 | 0 | 0 |
| | Oshetna River | Tributary | Pool | 0 | | 0 |
| UR-2 | TUVOI | | Rapid | 0 | 0 | 0 |
| (PRM 234.5- | | | Riffle | 0 | 0 | 1.6 |
| 248.6) | | | Run | 0 | 0 | 0 |
| , | | | Boulder Riffle | 1.5 | 12.4 | 6.5 |
| | Dia ala Dia an | Tallerateur | Pool | 0 | 0 | 0 |
| | Black River | Tributary | Riffle | 0 | 0 | 0 |
| | | | Run | 47.5 | 7.6 | 10.6 |
| | | Watana Rese | ervoir at Full Pool (PRM 232.5) | | | |
| | Cusitas Diver | Main Channal | Riffle | 0 | 0 | 0 |
| UR-3 | Susitna River | Main Channel | Run | 0 | 0 | 0 |
| (PRM | | | Boulder Riffle | 0 | 0 | 0 |
| 224.9- | | Tallerstone | Pool | 0 | 0 | 0 |
| 234.5) | Goose Creek | Tributary | Riffle | 0 | 0 | 0 |
| | | | Run | 0 | 0 | 0 |
| | | Clearwater Plume | Clearwater Plume | 0 | 0 | 0 |
| | Susitna River | Main Channel | Run | 0 | 0 | 0 |
| | | Split Main Channel | Run | 0 | 0 | 0 |
| | | | Pool | 0 | 0 | 0 |
| | Jay Creek ¹ | Tributary | Riffle | 0 | 0 | 0 |
| LID 4 | | | Run | 0 | 0 | 0 |
| UR-4 (PRM | | | Boulder Riffle | 7.6 | 19.5 | 17.4 |
| 208.1- | | T " . | Glide | | | 44.2 |
| 224.9) | Kosina Creek | Tributary | Riffle | 0 | 4.0 | 10.5 |
| | | | Run | 0 | 80.0 | 0 |
| | | | Boulder Riffle | 0 | 0 | 0 |
| | | _ , , | Percolation Channel | 0 | 0 | 0 |
| | Tsisi Creek | Tributary | Riffle | 0 | 0 | 0 |
| | | | Run | 0 | 0 | 0 |

Table-D19. Continued.

| Geo- | | | | Salmon | Salmon, Chinook (juvenile) | | |
|----------------------------------|-----------------|--------------------|---------------------|-----------------|----------------------------|------|--|
| morphic Reach | Stream | Macrohabitat Type | Mesohabitat Type | Early Summer | Late Summer | Fall | |
| UR-5 (PRM 203.4- 208.1) | Susitna River | Main Channel | Run | 0 | 0 | 0 | |
| | | Main Channel | Run | 0 | 0 | 0 | |
| | | Side Channel | Pool | 0 | 0 | 0 | |
| | Susitna River | Side Chamlei | Riffle | 0 | 0 | 0 | |
| | | Side Slough | Pool | 0 | 0 | 0 | |
| | | Split Main Channel | Run | 0 | 0 | 0 | |
| | Watana Creek | I I ribilitary | Beaver Pond | 0 | 0 | 0 | |
| | | | Boulder Riffle | 0 | 0 | 0 | |
| | | | Glide | 0 | 0 | 0 | |
| UR-6 | | | Percolation Channel | 0 | 0 | 0 | |
| (PRM | | | Pool | 0 | 0 | 0 | |
| 187.1- | | | Riffle | 0 | 0 | 0 | |
| 203.4) | | | Run | 0 | 0 | 0 | |
| | | | Boulder Riffle | 0 | 0 | 0 | |
| | Watana | | Glide | 0 | 0 | 0 | |
| | Creek | Tributary | Rapid | | 0 | 0 | |
| | Tributary | | Riffle | 0 | 0 | 0 | |
| | | | Run | 0 | 0 | 0 | |
| | Unnamed | | Pool | 0 | 0 | 0 | |
| | Tributary | Tributary | Riffle | 0 | 0 | 0 | |
| | 194.8 | | Run | 0 | | 0 | |

^{1.} Jay Creek was a direct-sampling tributary in which non-random site selection was used. See ISR Study 9.5 Section 4.4.2.2 for details. Notes: All data are provisional and subject to ongoing QA/QC. CPUE was calculated within tributaries or mainstem geomorphic reach as an average among sites by habitat type by season: Early Summer (July 13-August 11), Late Summer (August 12-September 9), and Fall (September 10-October 4). Data sources include: GRTS tributary sampling, direct tributary sampling, and mainstem transect sampling.

Table D20. Average CPUE (fish per 1,000 square meters) for Chinook salmon using snorkeling in the Upper River, 2013.

| | | | Salmo | on, Chinook (juven | ile) |
|---------------------|------------------------|-------------------------------|---------------|--------------------|------|
| Geomorphic Reach | Stream | Mesohabitat Type | Early Summer | Late Summer | Fall |
| | | Watana Reservoir at Full Pool | | | |
| UR-3 | | Boulder Riffle | 0 | 0 | 0 |
| (PRM 221.9- | Goose Creek | Pool | 0 | 0 | 0 |
| 234.5) | GOOGC GICCK | Riffle | 0 | | 0 |
| | | Run | 0 | 0 | 0 |
| | Jay Creek ¹ | Pool | 0 | 0 | 0 |
| | Jay Oleek | Run | 0 | 0 | 0 |
| | | Boulder Riffle | 9.2 | 0 | 0 |
| UR-4 | Kosina Creek | Glide | | | 0 |
| (PRM 208.1- | | Run | | 0 | 0 |
| 224.9) | Tsisi Creek | Boulder Riffle | 0 | 0 | 0 |
| | | Percolation Channel | 0 | 0 | 0 |
| | | Riffle | 0 | 0 | 0 |
| | | Run | 0 | 0 | 0 |
| | | Beaver Pond | 0 | 0 | 0 |
| | | Boulder Riffle | 0 | 0 | 0 |
| | Watana Creek | Pool | 0 | 0 | 0 |
| | | Riffle | 0 | 0 | 0 |
| UR-6 | | Run | 0 | 0 | 0 |
| (PRM 187.1- | | Boulder Riffle | | 0 | 0 |
| 203.4) | Watana Creek | Rapid | | 0 | 0 |
| • | Tributary | Riffle | 0 | 0 | 0 |
| | | Run | 0 | 0 | 0 |
| | | Pool | 0 | 0 | |
| | Unnamed | Riffle | 0 | 0 | |
| | Tributary 194.8 | Run | 0 | 0 | |
| | _1 | Proposed Watana Dam Location | n (PRM 187.1) | | |

^{1.} Jay Creek was a direct-sampling tributary in which non-random site selection was used. See ISR Study 9.5 Section 4.4.2.2 for details. Notes: All data are provisional and subject to ongoing QA/QC. CPUE was calculated within tributaries as an average among sites by habitat type by season: Early Summer (July 13-August 11), Late Summer (August 12-September 9), and Fall (September 10-October 4). Data sources include: GRTS tributary sampling and direct tributary sampling.

Table D21. Average CPUE (fish per hour of shocking time) for Arctic grayling using backpack electrofishing in the Upper River, 2013.

| Geo- | | | | Arctic grayling | | | |
|------------------|----------------------------------|--------------------|---------------------------------|-----------------|----------------|-------|--|
| morphic Reach | Stream | Macrohabitat Type | Mesohabitat Type | Early Summer | Late Summer | Fall | |
| | | | Boulder Riffle | 25.9 | 9.7 | 5.6 | |
| | | | Glide | 0 | 14.7 | 14.1 | |
| | | | Percolation Channel | 11.8 | 18.8 | 0 | |
| | Oshetna River | Tributary | Pool | 0 | | 0 | |
| UR-2 | TAVOI | | Rapid | 0 | 0 | 0 | |
| (PRM 234.5- | | | Riffle | 21.5 | 11.6 | 27.0 | |
| 248.6) | | | Run | 5.8 | 2.8 | 3.2 | |
| , | | | Boulder Riffle | 21.4 | 8.5 | 16.2 | |
| | Disak Divar | Tuibutan | Pool | 87.8 | 0 | 7.9 | |
| | Black River | Tributary | Riffle | 22.8 | 0 | 0 | |
| | | | Run | 48.4 | 13.8 | 11.5 | |
| | • | Watana Rese | ervoir at Full Pool (PRM 232.5) | • | • | | |
| | Susitna River | Main Obanası | Riffle | 6.2 | 0 | 77.7 | |
| UR-3 | | Main Channel | Run | 4.5 | 0 | 57.1 | |
| (PRM | | ek Tributary | Boulder Riffle | 33.0 | 31.4 | 14.4 | |
| 224.9- | 0 | | Pool | 0 | 27.8 | 20.5 | |
| 234.5) | Goose Creek | | Riffle | 59.4 | 72.6 | 73.8 | |
| | | | Run | 30.7 | 43.6 | 9.7 | |
| | Susitna River | Clearwater Plume | Clearwater Plume | 30.1 | 6.7 | 6.5 | |
| | | Main Channel | Run | 0 | 0 | 7.6 | |
| | | Split Main Channel | Run | 15.3 | 4.0 | 8.0 | |
| | | | Pool | 30.7 | 0 | 59.7 | |
| | Jay Creek ¹ Tributary | Tributary | Riffle | 16.1 | 30.8 | 0 | |
| | | | Run | 78.3 | 0 | 23.8 | |
| UR-4 (PRM | | | Boulder Riffle | 1.8 | 13.6 | 32.7 | |
| 208.1- | | T " (| Glide | | | 176.7 | |
| 224.9) | Kosina Creek | Tributary | Riffle | 0 | 0 | 0 | |
| | | | Run | 0 | 0 | 5.5 | |
| | | | Boulder Riffle | 18.3 | 3.1 | 3.6 | |
| | | | Percolation Channel | 21.7 | 21.2 | 28.1 | |
| | Tsisi Creek | Tributary | Riffle | 22.9 | 8.3 | 15.6 | |
| | | | Run | 6.3 | 9.4 | 0 | |

Table-D21. Continued.

| Geo- | | | | А | rctic grayling | |
|----------------------------------|-----------------|--------------------|------------------------------|-----------------|----------------|-------|
| morphic Reach | Stream | Macrohabitat Type | Mesohabitat Type | Early Summer | Late Summer | Fall |
| UR-5 (PRM 203.4- 208.1) | Susitna River | Main Channel | Run | 0 | 0 | 18.9 |
| | | Main Channel | Run | 0 | 1.9 | 27.0 |
| | | Side Channel | Pool | 4.8 | 0 | 14.3 |
| | Susitna River | Side Channel | Riffle | 6.8 | 4.9 | 12.3 |
| | | Side Slough | Pool | 9.9 | 0 | 5.4 |
| | | Split Main Channel | Run | 5.3 | 0 | 7.2 |
| | Watana Creek | Tributary | Beaver Pond | 0 | 0 | 0 |
| | | | Boulder Riffle | 38.6 | 7.5 | 36.2 |
| | | | Glide | 0 | 0 | 0 |
| UR-6 | | | Percolation Channel | 0 | 0 | 0 |
| (PRM | | | Pool | 0 | 0 | 0 |
| Ì87.1- | | | Riffle | 6.3 | 5.4 | 28.5 |
| 203.4) | | | Run | 26.2 | 13.2 | 20.8 |
| | | | Boulder Riffle | 11.8 | 16.6 | 112.5 |
| | Watana | | Glide | 0 | 0 | 0 |
| | Creek | Tributary | Rapid | | 36.0 | 9.8 |
| | Tributary | | Riffle | 33.3 | 15.3 | 12.7 |
| | | | Run | 76.5 | 55.6 | 104.3 |
| | Unnamed | | Pool | 27.3 | 0 | 0 |
| | Tributary | Tributary | Riffle | 0 | 0 | 0 |
| | 194.8 | | Run | 18.8 | | 0 |
| | | Proposed Wata | ana Dam Location (PRM 187.1) | | | |

^{1.} Jay Creek was a direct-sampling tributary in which non-random site selection was used. See ISR Study 9.5 Section 4.4.2.2 for details.

Notes: All data are provisional and subject to ongoing QA/QC. CPUE was calculated within tributaries or mainstem geomorphic reach as an average among sites by habitat type by season: Early Summer (July 13-August 11), Late Summer (August 12-September 9), and Fall (September 10-October 4). Data sources include: GRTS tributary sampling, direct tributary sampling, and mainstem transect sampling.

Table D22. Average CPUE (fish per hour of shocking time) for Arctic grayling using boat electrofishing in the Upper River, 2013.

| | | | | Arctic grayling | |
|---------------------------|--------------------|--------------------------------|-----------------|-----------------|------|
| Geomorphic Reach | Macrohabitat Type | Mesohabitat Type | Early Summer | Late Summer | Fall |
| | Watana I | Reservoir at Full Pool (PRM 23 | 32.5) | | |
| UR-3 | Main Channal | Riffle | 0 | 0 | 46.6 |
| (PRM 224.9-234.5) | Main Channel | Run | 0 | 0 | 15.5 |
| | Clearwater Plume | Clearwater Plume | | 0 | 11.9 |
| UR-4 (PRM 208.1-224.9) | Main Channel | Run | 1.1 | 0 | 1.7 |
| (FRIVI 200. 1-224.9) | Split Main Channel | Run | 0 | 0 | 36.4 |
| UR-5 (PRM 203.4-208.1) | Main Channel | Run | 1.6 | 0 | 16.4 |
| | Main Channel | Run | 0 | 6.4 | 72.7 |
| UR-6 (PRM 187.1-203.4) | Side Slough | Pool | 0 | 0 | 0 |
| (FRIVI 107.1-203.4) | Split Main Channel | Run | 0 | 0 | 22.3 |
| | Proposed | Watana Dam Location (PRM | 187.1) | | |

Notes: All data are provisional and subject to ongoing QA/QC. CPUE was calculated within mainstem geomorphic reach as an average among sites by habitat type by season: Early Summer (July 13-August 11), Late Summer (August 12-September 9), and Fall (September 10-October 4). Data sources include: mainstem transect sampling.

Table D23. Average CPUE (fish per 1,000 square meters) for Arctic grayling using seining in the Upper River, 2013.

| Geomorphic Reach | Stream | Macrohabitat Type | Mesohabitat Type | Early Summer | Late Summer | Fall |
|-------------------------------|------------------|--------------------|--------------------------|-----------------|----------------|------|
| UR-2 | Ochotno | | Pool | 0 | | |
| (PRM 234.5- | Oshetna River | Tributary | Riffle | 0 | | |
| 248.6) | INVE | | Run | 0 | | |
| | | Watana Reservoir a | at Full Pool (PRM 232.5) |) | | |
| UR-4 (PRM 208.1- 224.9) | Susitna River | Main Channel | Run | 0 | | |
| | | Main Channel | Run | 1.4 | 1.7 | 1.3 |
| LID C | Susitna River | Cida Channal | Pool | 6.7 | 21.7 | 0 |
| UR-6 (PRM 187.1- | Susitifa River | Side Channel | Riffle | 0 | | 0 |
| 203.4) | | Split Main Channel | Run | 3.9 | 3.1 | 10.5 |
| | Watana Creek | Tributary | Riffle | 0 | | |
| | | Proposed Watana Da | am Location (PRM 187. | 1) | | |

Notes: All data are provisional and subject to ongoing QA/QC. CPUE was calculated within tributaries or mainstem geomorphic reach as an average among sites by habitat type by season: Early Summer (July 13-August 11), Late Summer (August 12-September 9), and Fall (September 10-October 4). Data sources include: GRTS tributary sampling and mainstem transect sampling.

Table D24. Average CPUE (fish per 1,000 square meters) for Arctic grayling using snorkeling in the Upper River, 2013.

| | | | | Arctic grayling | |
|---------------------|-----------------|-----------------------------|-----------------|-----------------|-------|
| Geomorphic Reach | Stream | Mesohabitat Type | Early Summer | Late Summer | Fall |
| | | Watana Reservoir at Full Po | | | |
| UR-3 | | Boulder Riffle | 43.3 | 19.8 | 1.8 |
| (PRM 221.9- | Goose Creek | Pool | 111.2 | 135.3 | 2.5 |
| 234.5) | Goose Creek | Riffle | 1500.0 | | 0 |
| | | Run | 52.6 | 90.0 | 12.6 |
| | Jay Creek1 | Pool | 0 | 0 | 2.1 |
| | Jay Creek | Run | 0 | 0 | 0 |
| | | Boulder Riffle | 4.0 | 3.1 | 2.7 |
| UR-4 | Kosina Creek | Glide | | | 221.4 |
| (PRM 208.1- | | Run | | 0 | 0.3 |
| 224.9) | Tsisi Creek | Boulder Riffle | 13.0 | 0 | 7.5 |
| | | Percolation Channel | 10.7 | 10.5 | 0 |
| | | Riffle | 15.3 | 10.0 | 0.3 |
| | | Run | 5.3 | 0 | 0 |
| | | Beaver Pond | 0 | 0 | 0 |
| | | Boulder Riffle | 37.0 | 2.9 | 7.0 |
| | Watana Creek | Pool | 17.4 | 37.0 | 0 |
| | | Riffle | 2.2 | 0.6 | 0 |
| UR-6 | | Run | 1.4 | 1.2 | 0 |
| (PRM 187.1- | | Boulder Riffle | | 55.0 | 57.9 |
| 203.4) | Watana Creek | Rapid | | 26.7 | 1.9 |
| , | Tributary | Riffle | 38.9 | 20.5 | 9.4 |
| | | Run | 227.5 | 50.0 | 28.0 |
| | | Pool | 12.9 | 0 | |
| | Unnamed | Riffle | 0 | 0 | |
| | Tributary 194.8 | Run | 21.1 | 0 | |
| | 1 | Proposed Watana Dam Locat | ion (PRM 187.1) | | |

^{1.} Jay Creek was a direct-sampling tributary in which non-random site selection was used. See ISR Study 9.5 Section 4.4.2.2 for details. Notes: All data are provisional and subject to ongoing QA/QC. CPUE was calculated within tributaries as an average among sites by habitat type by season: Early Summer (July 13-August 11), Late Summer (August 12-September 9), and Fall (September 10-October 4). Data sources include: GRTS tributary sampling and direct tributary sampling.

Table D25. Average CPUE (fish per hour of shocking time) for burbot using backpack electrofishing in the Upper River, 2013.

| Geo- | | | | | Burbot | |
|------------------|-------------------|--------------------|---------------------------------|-----------------|----------------|------|
| morphic Reach | Stream | Macrohabitat Type | Mesohabitat Type | Early Summer | Late Summer | Fall |
| | | | Boulder Riffle | 0.9 | 0 | 0.6 |
| | | | Glide | 5.8 | 7.8 | 0 |
| | | | Percolation Channel | 0 | 0 | 0 |
| | Oshetna River | Tributary | Pool | 0 | | 0 |
| UR-2 | TAIVEI | | Rapid | 0 | 0 | 0 |
| (PRM 234.5- | | | Riffle | 0 | 0 | 4.1 |
| 248.6) | | | Run | 3.1 | 0.4 | 3.4 |
| , | | | Boulder Riffle | 1.5 | 3.0 | 0 |
| | Division Division | T.9. (| Pool | 0 | 0 | 0 |
| | Black River | Tributary | Riffle | 0 | 0 | 0 |
| | | | Run | 1.9 | 1.9 | 6.8 |
| | | Watana Rese | ervoir at Full Pool (PRM 232.5) | | | |
| | Susitna River | Mair Observat | Riffle | 6.2 | 4.5 | 0 |
| LID 2 | | Main Channel | Run | 0 | 3.6 | 8.2 |
| UR-3 (PRM | | Tributary | Boulder Riffle | 0 | 0 | 0 |
| 224.9- | | | Pool | 0 | 0 | 0 |
| 234.5) | Goose Creek | | Riffle | 0 | 0 | 0 |
| | | | Run | 0 | 0 | 0 |
| | | Clearwater Plume | Clearwater Plume | 5.1 | 12.1 | 2.3 |
| | Susitna River | Main Channel | Run | 3.2 | 3.1 | 3.4 |
| | | Split Main Channel | Run | 3.8 | 0 | 0 |
| | | | Pool | 6.1 | 0 | 17.1 |
| | Jay Creek1 | Tributary | Riffle | 0 | 0 | 0 |
| LID 4 | | | Run | 0 | 0 | 0 |
| UR-4 (PRM | | | Boulder Riffle | 0 | 0 | 0 |
| 208.1- | | T.9. (| Glide | | | 0 |
| 224.9) | Kosina Creek | Tributary | Riffle | 0 | 0 | 0 |
| | | | Run | 0 | 0 | 0 |
| | | | Boulder Riffle | 0 | 0 | 0 |
| | | | Percolation Channel | 0 | 0 | 0 |
| | Tsisi Creek | Tributary | Riffle | 0 | 0 | 0 |
| | | | Run | 0 | 0 | 0 |

Table-D25. Continued.

| Geo- | | | | | Burbot | |
|----------------------------------|-----------------|--------------------|------------------------------|-----------------|----------------|------|
| morphic Reach | Stream | Macrohabitat Type | Mesohabitat Type | Early Summer | Late Summer | Fall |
| UR-5 (PRM 203.4- 208.1) | Susitna River | Main Channel | Run | 0 | 0 | 0 |
| | | Main Channel | Run | 0 | 1.0 | 0 |
| | | Side Channel | Pool | 4.8 | 0 | 0 |
| | Susitna River | Side Chamler | Riffle | 6.8 | 0 | 6.2 |
| | | Side Slough | Pool | 0 | 0 | 0 |
| | | Split Main Channel | Run | 0 | 0 | 0 |
| | Watana Creek | I I rini itary | Beaver Pond | 0 | 0 | 0 |
| | | | Boulder Riffle | 0 | 0 | 0 |
| | | | Glide | 0 | 0 | 0 |
| UR-6 | | | Percolation Channel | 0 | 0 | 0 |
| (PRM | | | Pool | 0 | 0 | 0 |
| 187.1- | | | Riffle | 0 | 0 | 0 |
| 203.4) | | | Run | 0 | 0 | 0 |
| | | | Boulder Riffle | 0 | 0 | 0 |
| | Watana | | Glide | 0 | 0 | 0 |
| | Creek | Tributary | Rapid | | 0 | 0 |
| | Tributary | | Riffle | 0 | 0 | 0 |
| | | | Run | 0 | 0 | 0 |
| | Unnamed | | Pool | 0 | 0 | 0 |
| | Tributary | Tributary | Riffle | 0 | 0 | 0 |
| | 194.8 | | Run | 0 | | 0 |
| | • | Proposed Wata | ana Dam Location (PRM 187.1) |) | | |

^{1.} Jay Creek was a direct-sampling tributary in which non-random site selection was used. See ISR Study 9.5 Section 4.4.2.2 for details. Notes: All data are provisional and subject to ongoing QA/QC. CPUE was calculated within tributaries or mainstem geomorphic reach as an average among sites by habitat type by season: Early Summer (July 13-August 11), Late Summer (August 12-September 9), and Fall (September 10-October 4). Data sources include: GRTS tributary sampling, direct tributary sampling, and mainstem transect sampling.

Table D26. Average CPUE (fish per hour of shocking time) for burbot using boat electrofishing in the Upper River, 2013.

| | | | Burbot | | |
|---------------------------|--------------------|---------------------------------|-----------------|----------------|------|
| Geomorphic Reach | Macrohabitat Type | Mesohabitat Type | Early Summer | Late Summer | Fall |
| | Watana | a Reservoir at Full Pool (PRM 2 | 232.5) | | |
| UR-3 | Main Observal | Riffle | 0 | 0 | 11.7 |
| (PRM 224.9-234.5) | Main Channel | Run | 0 | 0 | 5.2 |
| | Clearwater Plume | Clearwater Plume | | 0 | 0 |
| UR-4 (PRM 208.1-224.9) | Main Channel | Run | 0.6 | 2.4 | 5.7 |
| (FRIVI 200.1-224.9) | Split Main Channel | Run | 0 | 0 | 0 |
| UR-5 (PRM 203.4-208.1) | Main Channel | Run | 3.3 | 0 | 0 |
| | Main Channel | Run | 1.0 | 3.1 | 0 |
| UR-6 (PRM 187.1-203.4) | Side Slough | Pool | 0 | 0 | 0 |
| (FRIVI 101.1-203.4) | Split Main Channel | Run | 0 | 0 | 0 |
| | Propose | d Watana Dam Location (PRM | 187.1) | | |

Notes: All data are provisional and subject to ongoing QA/QC. CPUE was calculated within mainstem geomorphic reach as an average among sites by habitat type by season: Early Summer (July 13-August 11), Late Summer (August 12-September 9), and Fall (September 10-October 4). Data sources include: mainstem transect sampling.

Table D27. Average CPUE (fish per 1,000 square meters) for burbot using seining in the Upper River, 2013.

| | | | | | Burbot | | |
|-------------------------------|------------------|--------------------|--------------------------|-----------------|----------------|------|--|
| Geomorphic Reach | Stream | Macrohabitat Type | Mesohabitat Type | Early Summer | Late Summer | Fall | |
| UR-2 | | | Pool | 0 | | | |
| (PRM 234.5- | Oshetna River | Tributary | Riffle | 0 | | | |
| 248.6) | INVE | | Run | 0 | | | |
| | | Watana Reservoir | at Full Pool (PRM 232.5) |) | | | |
| UR-4 (PRM 208.1- 224.9) | Susitna River | Main Channel | Run | 0 | | | |
| | | Main Channel | Run | 0 | 0 | 0 | |
| LID C | Overite a Divers | Olds Observat | Pool | 0 | 0 | 0 | |
| UR-6 (PRM 187.1- | Susitna River | Side Channel | Riffle | 0 | | 0 | |
| 203.4) | | Split Main Channel | Run | 0.7 | 0 | 0 | |
| , | Watana Creek | Tributary | Riffle | 0 | | | |
| | • | Proposed Watana D | am Location (PRM 187. | 1) | | | |

Table D28. Average CPUE (fish per hour of shocking time) for Dolly Varden using backpack electrofishing in the Upper River, 2013.

| Geo- | | | | | Dolly Varden | |
|------------------|------------------------|------------------------|---------------------------------|-----------------|----------------|------|
| morphic Reach | Stream | Macrohabitat Type | Mesohabitat Type | Early Summer | Late Summer | Fall |
| | | | Boulder Riffle | 0 | 0 | 0 |
| | Oshetna River | | Glide | 0 | 0 | 0 |
| | | | Percolation Channel | 0 | 0 | 0 |
| | | Tributary | Pool | 0 | | 0 |
| UR-2 | Taver | | Rapid | 0 | 0 | 0 |
| (PRM 234.5- | | | Riffle | 0 | 0 | 0 |
| 248.6) | | | Run | 0 | 0 | 0 |
| , | | | Boulder Riffle | 0 | 0 | 0 |
| | D D. | T 11 / | Pool | 0 | 0 | 0 |
| | Black River | Tributary | Riffle | 0 | 0 | 0 |
| | | | Run | 0 | 0 | 0 |
| | • | Watana Rese | ervoir at Full Pool (PRM 232.5) | | | |
| | 0 '' 5' | | Riffle | 0 | 0 | 0 |
| LID 2 | Susitna River | tna River Main Channel | Run | 0 | 0 | 0 |
| UR-3 (PRM | | Tributary | Boulder Riffle | 0 | 0 | 0 |
| 224.9- | | | Pool | 0 | 0 | 0 |
| 234.5) | Goose Creek | | Riffle | 0 | 0 | 0 |
| | | | Run | 0 | 0 | 0 |
| | | Clearwater Plume | Clearwater Plume | 0 | 0 | 0 |
| | Susitna River | Main Channel | Run | 0 | 0 | 0 |
| | | Split Main Channel | Run | 0 | 0 | 0 |
| | | | Pool | 79.7 | 0 | 50.2 |
| | Jay Creek ¹ | Tributary | Riffle | 0 | 0 | 0 |
| LID 4 | | | Run | 120.7 | 0 | 15.7 |
| UR-4 (PRM | | | Boulder Riffle | 0 | 0 | 0 |
| 208.1- | | T 7. (| Glide | | | 0 |
| 224.9) | Kosina Creek | Tributary | Riffle | 0 | 0 | 0 |
| | | | Run | 0 | 0 | 0 |
| | | | Boulder Riffle | 0 | 0 | 0 |
| | | | Percolation Channel | 0 | 0 | 0 |
| | Tsisi Creek | Tributary | Riffle | 0 | 0 | 0 |
| | | | Run | 0 | 0 | 0 |

Table-D28. Continued.

| | | | | Dolly Varden | |
|---------------|--|--|--|--|---|
| Stream | Macrohabitat Type | Mesohabitat Type | Early Summer | Late Summer | Fall |
| Susitna River | Main Channel | Run | 0 | 0 | 0 |
| | Main Channel | Run | 0 | 0 | 0 |
| | Cide Channel | Pool | 0 | 0 | 0 |
| Susitna River | Side Channel | Riffle | 0 | 0 | 0 |
| | Side Slough | Pool | 0 | 0 | 0 |
| | Split Main Channel | Run | 0 | 0 | 0 |
| | Tributary | Beaver Pond | 0 | 0 | 0 |
| | | Boulder Riffle | 27.9 | 6.9 | 5.3 |
| | | Glide | 62.1 | 12.8 | 50.9 |
| | | Percolation Channel | 0 | 47.4 | 0 |
| CIGGR | | Pool | 41.1 | 10.2 | 14.4 |
| | | Riffle | 82.4 | 7.3 | 17.7 |
| | | Run | 18.7 | 3.5 | 5.4 |
| | | Boulder Riffle | 0 | 0 | 0 |
| Watana | | Glide | 24.2 | 0 | 0 |
| Creek | Tributary | Rapid | | 12.0 | 0 |
| Tributary | | Riffle | 3.3 | 7.9 | 3.8 |
| | | Run | 0 | 11.0 | 0 |
| Unnamed | | Pool | 10.3 | 11.8 | 35.2 |
| Tributary | Tributary | Riffle | 56.8 | 0 | 0 |
| 194.8 | | Run | 75.3 | | 38.5 |
| | Susitna River Susitna River Watana Creek With the state of the stat | Susitna River Main Channel Side Channel Side Slough Split Main Channel Watana Creek Tributary Unnamed Tributary Tributary Tributary Tributary Tributary | Susitna River Main Channel Run Pool Riffle Side Channel Side Slough Pool Split Main Channel Run Beaver Pond Boulder Riffle Glide Percolation Channel Pool Riffle Run Pool Riffle Glide Prool Riffle Run Watana Creek Tributary Stream Macrohabitat Type Mesohabitat Type Early Summer Susitna River Main Channel Run 0 Susitna River Main Channel Run 0 Side Channel Pool 0 Riffle 0 0 Side Slough Pool 0 Split Main Channel Run 0 Beaver Pond 0 0 Boulder Riffle 27.9 Glide 62.1 Percolation Channel 0 Pool 41.1 Riffle 82.4 Run 18.7 Boulder Riffle 0 Glide 24.2 Rapid 7 Tributary Riffle 3.3 Run 0 Unnamed Tributary Riffle 56.8 | Stream Macrohabitat Type Mesohabitat Type Summer Summer Susitna River Main Channel Run 0 0 Susitna River Main Channel Run 0 0 Side Channel Pool 0 0 Riffle 0 0 0 Side Slough Pool 0 0 Split Main Channel Run 0 0 Beaver Pond 0 0 0 Boulder Riffle 27.9 6.9 Glide 62.1 12.8 Percolation Channel 0 47.4 Pool 41.1 10.2 Riffle 82.4 7.3 Run 18.7 3.5 Boulder Riffle 0 0 Glide 24.2 0 Creek Tributary Rapid 12.0 Riffle 3.3 7.9 Run 0 11.0 Unnamed Tributary Riffle |

^{1.} Jay Creek was a direct-sampling tributary in which non-random site selection was used. See ISR Study 9.5 Section 4.4.2.2 for details. Notes: All data are provisional and subject to ongoing QA/QC. CPUE was calculated within tributaries or mainstem geomorphic reach as an average among sites by habitat type by season: Early Summer (July 13-August 11), Late Summer (August 12-September 9), and Fall (September 10-October 4). Data sources include: GRTS tributary sampling, direct tributary sampling, and mainstem transect sampling.

Table D29. Average CPUE (fish per 1,000 square meters) for Dolly Varden using snorkeling in the Upper River, 2013.

| | | | | Dolly Varden | |
|---------------------|------------------------|-----------------------------|-----------------|--------------|------|
| Geomorphic Reach | Stream | Mesohabitat Type | Early Summer | Late Summer | Fall |
| | | Watana Reservoir at Full Po | | | |
| UR-3 | | Boulder Riffle | 0 | 0 | 0 |
| (PRM 221.9- | Goose Creek | Pool | 0 | 0 | 0 |
| 234.5) | GOOGC OTCCK | Riffle | 0 | | 0 |
| | | Run | 0 | 0 | 0 |
| | Jay Creek ¹ | Pool | 130.4 | 0 | 0 |
| | Jay Oreek | Run | 50.0 | 0 | 4.0 |
| UR-4 | Kosina Creek | Boulder Riffle | 0 | 0 | 0 |
| | | Glide | | | 0 |
| (PRM 208.1- | | Run | | 0 | 0 |
| 224.9) | Tsisi Creek | Boulder Riffle | 0 | 0 | 0 |
| | | Percolation Channel | 0 | 0 | 0 |
| | | Riffle | 0 | 0 | 0 |
| | | Run | 0 | 0 | 0 |
| | | Beaver Pond | 0 | 0 | 0 |
| | | Boulder Riffle | 13.4 | 0 | 0 |
| | Watana Creek | Pool | 191.0 | 0 | 0 |
| | | Riffle | 10.8 | 0 | 0 |
| UR-6 | | Run | 6.3 | 4.4 | 0 |
| (PRM 187.1- | | Boulder Riffle | | 0 | 0 |
| 203.4) | Watana Creek | Rapid | | 0 | 0 |
| • | Tributary | Riffle | 0 | 0 | 0 |
| | | Run | 0 | 0 | 0 |
| | | Pool | 0 | 0 | |
| | Unnamed | Riffle | 20.0 | 5.0 | |
| | Tributary 194.8 | Run | 15.8 | 0 | |
| | 1 | Proposed Watana Dam Locat | ion (PRM 187.1) | l l | |

^{1.} Jay Creek was a direct-sampling tributary in which non-random site selection was used. See ISR Study 9.5 Section 4.4.2.2 for details. Notes: All data are provisional and subject to ongoing QA/QC. CPUE was calculated within tributaries as an average among sites by habitat type by season: Early Summer (July 13-August 11), Late Summer (August 12-September 9), and Fall (September 10-October 4). Data sources include: GRTS tributary sampling and direct tributary sampling.

Table D30. Average CPUE (fish per hour of shocking time) for longnose sucker using backpack electrofishing in the Upper River, 2013.

| Geo- | | | | Lo | ngnose sucke | r |
|------------------|------------------------|-----------------------|---------------------------------|-----------------|----------------|------|
| morphic Reach | Stream | Macrohabitat Type | Mesohabitat Type | Early Summer | Late Summer | Fall |
| | | | Boulder Riffle | 0 | 0 | 0.6 |
| | | | Glide | 0 | 0 | 0 |
| | | | Percolation Channel | 0 | 0 | 0 |
| | Oshetna River | Tributary | Pool | 0 | | 0 |
| UR-2 | IXIVEI | | Rapid | 0 | 0 | 0 |
| (PRM 234.5- | | | Riffle | 0 | 0 | 0 |
| 234.5- | | | Run | 1.7 | 0 | 0 |
| | | | Boulder Riffle | 0 | 0 | 0 |
| | D D. | Tributon | Pool | 0 | 0 | 0 |
| | Black River | Tributary | Riffle | 0 | 0 | 0 |
| | | | Run | 0 | 1.9 | 0 |
| | | Watana Rese | ervoir at Full Pool (PRM 232.5) | | | |
| | Consider a Discour | Main Ohamad | Riffle | 0 | 0 | 6.5 |
| UR-3 | Susitna River | Main Channel | Run | 0 | 10.9 | 0 |
| (PRM | | Goose Creek Tributary | Boulder Riffle | 0.7 | 0 | 0 |
| 224.9- | | | Pool | 0 | 0 | 0 |
| 234.5) | Goose Creek | | Riffle | 0 | 0 | 0 |
| | | | Run | 0.9 | 0 | 0 |
| | | Clearwater Plume | Clearwater Plume | 3.0 | 2.6 | 0 |
| | Susitna River | Main Channel | Run | 0 | 0 | 1.6 |
| | | Split Main Channel | Run | 3.8 | 0 | 0 |
| | | | Pool | 0 | 0 | 0 |
| | Jay Creek ¹ | Tributary | Riffle | 0 | 0 | 0 |
| LID 4 | | | Run | 0 | 0 | 0 |
| UR-4 (PRM | | | Boulder Riffle | 0 | 0 | 0 |
| 208.1- | | T % 1 | Glide | | | 0 |
| 224.9) | Kosina Creek | Tributary | Riffle | 0 | 0 | 0 |
| | | | Run | 0 | 0 | 0 |
| | | | Boulder Riffle | 0 | 0 | 0 |
| | T | T " . | Percolation Channel | 0 | 0 | 0 |
| | Tsisi Creek | Tributary | Riffle | 0 | 0 | 0 |
| | | | Run | 0 | 0 | 0 |

Table-D30. Continued.

| | | | Lo | ngnose sucke | r |
|---------------|---|---|-------------------------------------|--|--|
| Stream | Macrohabitat Type | Mesohabitat Type | Early Summer | Late Summer | Fall |
| Susitna River | Main Channel | Run | 0 | 0 | 0 |
| | Main Channel | Run | 5.7 | 0 | 0 |
| | Cida Channal | Pool | 24.1 | 5.9 | 9.5 |
| Susitna River | Side Channel | Riffle | 0 | 0 | 12.3 |
| | Side Slough | Pool | 9.9 | 0 | 5.4 |
| | Split Main Channel | Run | 2.5 | 0 | 0 |
| | I I rini itarv | Beaver Pond | 0 | 0 | 0 |
| | | Boulder Riffle | 2.7 | 0 | 0 |
| | | Glide | 0 | 0 | 0 |
| | | Percolation Channel | 0 | 0 | 0 |
| Oleek | | Pool | 0 | 0 | 0 |
| | | Riffle | 0 | 0 | 0 |
| | | Run | 0 | 0 | 0 |
| | | Boulder Riffle | 0 | 0 | 0 |
| Watana | | Glide | 0 | 0 | 0 |
| Creek | Tributary | Rapid | | 0 | 0 |
| Tributary | | Riffle | 0 | 0 | 0 |
| | | Run | 0 | 0 | 0 |
| Unnamed | | Pool | 0 | 0 | 0 |
| Tributary | Tributary | Riffle | 0 | 0 | 0 |
| 194.8 | | Run | 0 | | 0 |
| | Susitna River Susitna River Watana Creek Tributary Unnamed Tributary | Susitna River Main Channel Main Channel Side Channel Side Slough Split Main Channel Tributary Watana Creek Tributary Unnamed Tributary Tributary Tributary Tributary | Susitna River Main Channel Run | Stream Macrohabitat Type Mesohabitat Type Early Summer Susitna River Main Channel Run 0 Susitna River Main Channel Run 5.7 Side Channel Pool 24.1 Riffle 0 9.9 Split Main Channel Run 2.5 Beaver Pond 0 0 Boulder Riffle 2.7 Glide 0 Percolation Channel 0 Pool 0 Run 0 Boulder Riffle 0 Run 0 Boulder Riffle 0 Run 0 Rapid 0 Run 0 Run 0 Run 0 Pool 0 Run 0 Run 0 Riffle 0 Riffle 0 Run 0 Run 0 Run 0 | Stream Macrohabitat Type Mesohabitat Type Summer Summer Susitna River Main Channel Run 0 0 Susitna River Main Channel Run 5.7 0 Susitna River Main Channel Pool 24.1 5.9 Riffle 0 0 0 Side Channel Riffle 0 0 Side Slough Pool 9.9 0 Split Main Channel Run 2.5 0 Beaver Pond 0 0 0 Boulder Riffle 2.7 0 0 Glide 0 0 0 Percolation Channel 0 0 0 Riffle 0 0 0 Run 0 0 0 Watana Tributary Rapid 0 0 Glide 0 0 0 Rapid 0 0 0 Run 0 0 |

^{1.} Jay Creek was a direct-sampling tributary in which non-random site selection was used. See ISR Study 9.5 Section 4.4.2.2 for details. Notes: All data are provisional and subject to ongoing QA/QC. CPUE was calculated within tributaries or mainstem geomorphic reach as an average among sites by habitat type by season: Early Summer (July 13-August 11), Late Summer (August 12-September 9), and Fall (September 10-October 4). Data sources include: GRTS tributary sampling, direct tributary sampling, and mainstem transect sampling.

Table D31. Average CPUE (fish per hour of shocking time) for longnose sucker using boat electrofishing in the Upper River, 2013.

| | | | Lo | ngnose sucker | |
|---------------------------|--------------------|-------------------------------|-----------------|----------------|------|
| Geomorphic Reach | Macrohabitat Type | Mesohabitat Type | Early Summer | Late Summer | Fall |
| | Watana | Reservoir at Full Pool (PRM 2 | 32.5) | | |
| UR-3 | Main Channal | Riffle | 0 | 0 | 0 |
| (PRM 224.9-234.5) | Main Channel | Run | 0 | 0 | 0 |
| | Clearwater Plume | Clearwater Plume | | 0 | 11.9 |
| UR-4 (PRM 208.1-224.9) | Main Channel | Run | 0 | 0 | 0 |
| (FRIVI 200.1-224.9) | Split Main Channel | Run | 0 | 0 | 0 |
| UR-5 (PRM 203.4-208.1) | Main Channel | Run | 0 | 0 | 0 |
| | Main Channel | Run | 0 | 2.0 | 0 |
| UR-6 (PRM 187.1-203.4) | Side Slough | Pool | 5.6 | 0 | 0 |
| (FIXIVI 107.1-203.4) | Split Main Channel | Run | 0 | 0 | 0 |
| | Proposed | Watana Dam Location (PRM | 187.1) | | |

Table D32. Average CPUE (fish per 1,000 square meters) for longnose sucker using seining in the Upper River, 2013.

| | | | | Lo | Longnose sucker | | |
|-------------------------------|------------------|--------------------|--------------------------|-----------------|-----------------|------|--|
| Geomorphic Reach | Stream | Macrohabitat Type | Mesohabitat Type | Early Summer | Late Summer | Fall | |
| UR-2 | | | Pool | 0 | | | |
| (PRM 234.5- | Oshetna River | Tributary | Riffle | 0 | | | |
| 248.6) | IXIVEI | | Run | 0 | | | |
| | | Watana Reservoir | at Full Pool (PRM 232.5) | | | | |
| UR-4 (PRM 208.1- 224.9) | Susitna River | Main Channel | Run | 0 | | | |
| | | Main Channel | Run | 2.9 | 6.7 | 0 | |
| LID 0 | 0 - 11 - 10 | 0:1-011 | Pool | 1.1 | 10.9 | 0 | |
| UR-6 (PRM 187.1- | Susitna River | Side Channel | Riffle | 47.2 | | 30.8 | |
| 203.4) | | Split Main Channel | Run | 1.3 | 11.5 | 0 | |
| , | Watana Creek | Tributary | Riffle | 0 | | | |
| | | Proposed Watana D | am Location (PRM 187. | 1) | | | |

Table D33. Average CPUE (fish per 1,000 square meters) for longnose sucker using snorkeling in the Upper River, 2013.

| | | | L | ongnose sucker | |
|---------------------|-----------------|------------------------------|----------------|----------------|------|
| Geomorphic Reach | Stream | Mesohabitat Type | Early Summer | Late Summer | Fall |
| | | Watana Reservoir at Full Poo | | | |
| UR-3 | | Boulder Riffle | 0.2 | 0 | 0 |
| (PRM 221.9- | Goose Creek | Pool | 0.8 | 3.7 | 0 |
| 234.5) | Goose Creek | Riffle | 0 | | 0 |
| | | Run | 0 | 0 | 0 |
| | Jay Creek1 | Pool | 0 | 0 | 0 |
| | Jay Creek | Run | 0 | 0 | 0 |
| | Kosina Creek | Boulder Riffle | 0 | 0 | 0 |
| UR-4 | | Glide | | | 0 |
| (PRM 208.1- | | Run | | 0 | 0 |
| 224.9) | Tsisi Creek | Boulder Riffle | 0 | 0 | 0 |
| | | Percolation Channel | 0 | 0 | 0 |
| | | Riffle | 0 | 0 | 0 |
| | | Run | 0 | 0 | 0 |
| | | Beaver Pond | 0 | 0 | 0 |
| | | Boulder Riffle | 0 | 0 | 0 |
| | Watana Creek | Pool | 0 | 0 | 0 |
| | | Riffle | 0 | 0 | 0 |
| UR-6 | | Run | 0 | 0 | 0 |
| (PRM 187.1- | | Boulder Riffle | | 0 | 0 |
| 203.4) | Watana Creek | Rapid | | 0 | 0 |
| , | Tributary | Riffle | 0 | 0 | 0 |
| | | Run | 0 | 0 | 0 |
| | | Pool | 0 | 0 | |
| | Unnamed | Riffle | 0 | 0 | |
| | Tributary 194.8 | Run | 5.3 | 0 | |
| | 1 | Proposed Watana Dam Locati | on (PRM 187.1) | | |

^{1.} Jay Creek was a direct-sampling tributary in which non-random site selection was used. See ISR Study 9.5 Section 4.4.2.2 for details. Notes: All data are provisional and subject to ongoing QA/QC. CPUE was calculated within tributaries as an average among sites by habitat type by season: Early Summer (July 13-August 11), Late Summer (August 12-September 9), and Fall (September 10-October 4). Data sources include: GRTS tributary sampling and direct tributary sampling.

Table D34. Average CPUE (fish per hour of shocking time) for sculpin using backpack electrofishing in the Upper River, 2013.

| Geo- | | | | Sculpi | in, undifferent | iated |
|------------------|------------------------|-------------------------|---------------------------------|-----------------|-----------------|-------|
| morphic Reach | Stream | Macrohabitat Type | Mesohabitat Type | Early Summer | Late Summer | Fall |
| | | | Boulder Riffle | 84.7 | 113.4 | 98.9 |
| | | | Glide | 114.3 | 78.9 | 65.1 |
| | Oshetna River | | Percolation Channel | 47.2 | 75.4 | 19.0 |
| | | Tributary | Pool | 71.8 | | 14.6 |
| UR-2 | Taver | | Rapid | 168.8 | 86.4 | 175.1 |
| (PRM 234.5- | | | Riffle | 56.9 | 71.6 | 82.9 |
| 248.6) | | | Run | 39.2 | 57.0 | 68.9 |
| , | | | Boulder Riffle | 73.5 | 106.4 | 104.6 |
| | D D. | | Pool | 54.9 | 210.9 | 197.8 |
| | Black River | Tributary | Riffle | 136.7 | 92.0 | 96.6 |
| | | | Run | 169.0 | 129.2 | 114.1 |
| | 1 | Watana Rese | ervoir at Full Pool (PRM 232.5) | • | • | |
| | | itna River Main Channel | Riffle | 24.8 | 27.2 | 6.5 |
| LID 2 | Susitna River | | Run | 13.5 | 10.9 | 8.2 |
| UR-3 (PRM | | ek Tributary | Boulder Riffle | 21.2 | 17.5 | 10.9 |
| 224.9- | | | Pool | 2.7 | 0 | 15.7 |
| 234.5) | Goose Creek | | Riffle | 65.1 | 27.5 | 39.6 |
| | | | Run | 16.1 | 6.8 | 9.2 |
| | | Clearwater Plume | Clearwater Plume | 59.2 | 24.1 | 16.0 |
| | Susitna River | Main Channel | Run | 8.2 | 6.1 | 6.2 |
| | | Split Main Channel | Run | 7.7 | 8.0 | 12.0 |
| | | | Pool | 30.7 | 8.9 | 0 |
| | Jay Creek ¹ | Tributary | Riffle | 208.9 | 92.3 | 169.4 |
| LID 4 | | | Run | 19.6 | 0 | 35.8 |
| UR-4 (PRM | | | Boulder Riffle | 37.3 | 31.6 | 52.3 |
| 208.1- | | T 11 (| Glide | | | 154.6 |
| 224.9) | Kosina Creek | Tributary | Riffle | 42.7 | 17.0 | 60.5 |
| | | | Run | 7.1 | 5.0 | 31.8 |
| | | | Boulder Riffle | 81.7 | 37.4 | 70.4 |
| | | | Percolation Channel | 0 | 15.9 | 98.4 |
| | Tsisi Creek | Tributary | Riffle | 193.0 | 72.4 | 40.5 |
| | | | Run | 106.6 | 156.9 | 36.5 |

Table-D34. Continued.

| Geo- | | | | Sculpi | n, undifferenti | ated |
|----------------------------------|-----------------|--------------------|-----------------------------|-----------------|-----------------|------|
| morphic Reach | Stream | Macrohabitat Type | Mesohabitat Type | Early Summer | Late Summer | Fall |
| UR-5 (PRM 203.4- 208.1) | Susitna River | Main Channel | Run | 2.3 | 9.2 | 18.5 |
| | | Main Channel | Run | 1.4 | 9.5 | 15.0 |
| | | Side Channel | Pool | 53.0 | 47.5 | 57.2 |
| | Susitna River | Side Channel | Riffle | 6.8 | 39.0 | 24.6 |
| | | Side Slough | Pool | 19.9 | 59.0 | 48.4 |
| | | Split Main Channel | Run | 18.5 | 19.2 | 47.3 |
| | | I I ribilitary | Beaver Pond | 20.0 | 22.8 | 5.4 |
| | | | Boulder Riffle | 59.4 | 73.9 | 26.8 |
| | | | Glide | 20.7 | 6.4 | 17.0 |
| UR-6 | Watana Creek | | Percolation Channel | 0 | 0 | 0 |
| (PRM | Oleck | | Pool | 41.1 | 0 | 28.8 |
| Ì87.1- | | | Riffle | 139.3 | 18.0 | 81.7 |
| 203.4) | | | Run | 84.8 | 25.7 | 65.0 |
| | | | Boulder Riffle | 27.9 | 11.0 | 0 |
| | Watana | | Glide | 36.2 | 47.6 | 65.5 |
| | Creek | Tributary | Rapid | | 31.7 | 19.6 |
| | Tributary | | Riffle | 36.7 | 13.8 | 14.0 |
| | | Run | 0 | 44.4 | 13.3 | |
| | Unnamed | | Pool | 120.2 | 33.4 | 78.6 |
| | Tributary | Tributary | Riffle | 34.1 | 11.3 | 0 |
| | 194.8 | | Run | 181.9 | | 38.5 |
| | | Proposed Water | ana Dam Location (PRM 187.1 |) | | |

^{1.} Jay Creek was a direct-sampling tributary in which non-random site selection was used. See ISR Study 9.5 Section 4.4.2.2 for details. Notes: All data are provisional and subject to ongoing QA/QC. CPUE was calculated within tributaries or mainstem geomorphic reach as an average among sites by habitat type by season: Early Summer (July 13-August 11), Late Summer (August 12-September 9), and Fall (September 10-October 4). Data sources include: GRTS tributary sampling, direct tributary sampling, and mainstem transect sampling.

Table D35. Average CPUE (fish per hour of shocking time) for sculpin using boat electrofishing in the Upper River, 2013.

| | | | Sculp | in, undifferentia | ted |
|---------------------------|--------------------|-------------------------------|-----------------|-------------------|------|
| Geomorphic Reach | Macrohabitat Type | Mesohabitat Type | Early Summer | Late Summer | Fall |
| | Watana | Reservoir at Full Pool (PRM 2 | 32.5) | | |
| UR-3 | Main Channal | Riffle | 0 | 0 | 0 |
| (PRM 224.9-234.5) | Main Channel | Run | 0 | 0 | 0 |
| UB 4 | Clearwater Plume | Clearwater Plume | | 0 | 4.0 |
| UR-4 (PRM 208.1-224.9) | Main Channel | Run | 0 | 0 | 0 |
| (FRIVI 200. 1-224.9) | Split Main Channel | Run | 3.9 | 0 | 7.3 |
| UR-5 (PRM 203.4-208.1) | Main Channel | Run | 0 | 0 | 0 |
| | Main Channel | Run | 0 | 1.5 | 0 |
| UR-6 | Side Slough | Pool | 0 | 0 | 0 |
| (PRM 187.1-203.4) | Split Main Channel | Run | 0 | 0 | 0 |
| | Proposed | Watana Dam Location (PRM | 187.1) | | |

Table D36. Average CPUE (fish per 1,000 square meters) for sculpin using seining in the Upper River, 2013.

| | | | | Sculpin, undifferentiated | | ated |
|-------------------------------|------------------|--------------------|--------------------------|---------------------------|----------------|------|
| Geomorphic Reach | Stream | Macrohabitat Type | Mesohabitat Type | Early Summer | Late Summer | Fall |
| UR-2 | | | Pool | 0 | | |
| (PRM 234.5- | Oshetna River | Tributary | Riffle | 0 | | |
| 248.6) | INVE | | Run | 0 | | |
| | | Watana Reservoir | at Full Pool (PRM 232.5) | | | |
| UR-4 (PRM 208.1- 224.9) | Susitna River | Main Channel | Run | 0 | | |
| | 0 11 51 | Main Channel | Run | 0.7 | 0 | 0 |
| LID C | | Olds Observat | Pool | 3.3 | 10.9 | 0 |
| UR-6 (PRM 187.1- 203.4) | Susitna River | Side Channel | Riffle | 4.7 | | 0 |
| | | Split Main Channel | Run | 0.7 | 0 | 0 |
| | Watana Creek | Tributary | Riffle | 0 | | |
| | | Proposed Watana D | am Location (PRM 187. | 1) | • | |

Table D37. Average CPUE (fish per 1,000 square meters) for sculpin using snorkeling in the Upper River, 2013.

| | | | pin, undifferentiated | t | |
|---------------------|------------------------|-----------------------------|-----------------------|-------------|------|
| Geomorphic Reach | Stream | Mesohabitat Type | Early Summer | Late Summer | Fall |
| | _ | Watana Reservoir at Full Po | | | |
| UR-3 | | Boulder Riffle | 0.1 | 0 | 0 |
| (PRM 221.9- | Goose Creek | Pool | 0 | 0 | 0 |
| 234.5) | Goose Creek | Riffle | 100.0 | | 0 |
| | | Run | 0.9 | 0 | 0 |
| | lov Crook1 | Pool | 0 | 0 | 0 |
| | Jay Creek ¹ | Run | 0 | 0 | 0 |
| | | Boulder Riffle | 0.2 | 0 | 0 |
| UR-4 | Kosina Creek | Glide | | | 0 |
| (PRM 208.1- | | Run | | 0 | 0 |
| 224.9) | Tsisi Creek | Boulder Riffle | 0.7 | 0 | 0.5 |
| | | Percolation Channel | 0 | 0 | 0 |
| | | Riffle | 0.1 | 0 | 0 |
| | | Run | 0.2 | 0 | 0 |
| | Watana Creek | Beaver Pond | 0 | 0 | 0 |
| | | Boulder Riffle | 0 | 0 | 0 |
| | | Pool | 0 | 0 | 0 |
| | | Riffle | 0 | 0 | 0 |
| UR-6 | | Run | 0 | 0 | 0 |
| (PRM 187.1- | | Boulder Riffle | | 0 | 0 |
| 203.4) | Watana Creek | Rapid | | 0 | 0 |
| , | Tributary | Riffle | 0.3 | 0 | 0 |
| | | Run | 0 | 2.8 | 0 |
| | | Pool | 2.9 | 0 | |
| | Unnamed | Riffle | 0 | 0 | |
| | Tributary 194.8 | Run | 5.3 | 0 | |
| | 1 | Proposed Watana Dam Loca | | | |

^{1.} Jay Creek was a direct-sampling tributary in which non-random site selection was used. See ISR Study 9.5 Section 4.4.2.2 for details. Notes: All data are provisional and subject to ongoing QA/QC. CPUE was calculated within tributaries as an average among sites by habitat type by season: Early Summer (July 13-August 11), Late Summer (August 12-September 9), and Fall (September 10-October 4). Data sources include: GRTS tributary sampling and direct tributary sampling.

Table D38. Average CPUE (fish per hour of shocking time) for lake trout using backpack electrofishing in the Upper River, 2013.

| Name | Geo- | | | | Trout, lake | | | |
|--|---------|------------------------|--------------------|---------------------------------|-------------|---|------|---|
| UR-2 (PRM 234-5-248-6) Parcentage Problem Probl | morphic | Stream | Macrohabitat Type | Mesohabitat Type | | | Fall | |
| UR-2 (PRM (PRM 224.9- 234.5) Percolation Channel O | | | ,. | | 0 | 0 | 0 | |
| Oshetna River Pool O | | | | Glide | 0 | 0 | 0 | |
| River River River River Rapid 0 | | | | Percolation Channel | 0 | 0 | 0 | |
| Rapid | | | Tributary | Pool | 0 | | 0 | |
| Run | | Kivei | | Rapid | 0 | 0 | 0 | |
| Run | | | | Riffle | 0 | 0 | 0 | |
| Black River Black River Black River Tributary Boulder Riffle Double Do | | | | Run | 0 | 0 | 0 | |
| Black River Tributary Riffle | , | | | Boulder Riffle | 0 | 0 | 0 | |
| Riffle | | D D. | | Pool | 0 | 0 | 0 | |
| Value Valu | | Black River | Tributary | Riffle | 0 | 0 | 0 | |
| UR-3 (PRM 224.9-234.5) Susitna River Main Channel Riffle | | | | Run | 0 | 0 | 0 | |
| Susitna River Main Channel Run | | 1 | Watana Rese | ervoir at Full Pool (PRM 232.5) | | | | |
| Name | | 0 11 51 | | Riffle | 0 | 0 | 0 | |
| PRM 224.9- 234.5 Goose Creek Tributary Boulder Riffle D | | Susitna River | Main Channel | Run | 0 | 0 | 0 | |
| Pool O O O O | | Goose Creek | Tributary | Boulder Riffle | 0 | 0 | 0 | |
| Riffle | 224.9- | | | Pool | 0 | 0 | 0 | |
| Susitna River Clearwater Plume Clearwater Plume O O O | 234.5) | | | Riffle | 0 | 0 | 0 | |
| Susitna River Main Channel Run 0 0 0 0 | | | | Run | 0 | 0 | 0 | |
| Split Main Channel Run 0 0 0 | | | Clearwater Plume | Clearwater Plume | 0 | 0 | 0 | |
| UR-4 (PRM 208.1-224.9) Kosina Creek Tributary Fool | | Susitna River | Susitna River | Main Channel | Run | 0 | 0 | 0 |
| UR-4 (PRM 208.1-224.9) Kosina Creek Tributary Riffle 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | | | Split Main Channel | Run | 0 | 0 | 0 | |
| UR-4 (PRM 208.1- 224.9) Kosina Creek Tributary Example 1 | | | | Pool | 0 | 0 | 0 | |
| UR-4 (PRM 208.1- 224.9) Kosina Creek Tributary Boulder Riffle 0 0 0 0 Glide 0 0 Riffle 0 0 0 Run 0 0 Boulder Riffle 0 0 0 0 Percolation Channel 0 0 0 | | Jay Creek ¹ | Tributary | Riffle | 0 | 0 | 0 | |
| Rosina Creek Tributary Boulder Riffle 0 0 0 0 | LID 4 | | | Run | 0 | 0 | 0 | |
| Rosina Creek Tributary Glide 0 0 0 0 0 0 0 0 0 | | | | Boulder Riffle | 0 | 0 | 0 | |
| Riffle | 208.1- | | T 11 (| Glide | | | 0 | |
| Boulder Riffle | 224.9) | Kosina Creek | Tributary | Riffle | 0 | 0 | 0 | |
| Percolation Channel 0 0 0 | | | | Run | 0 | 0 | 0 | |
| Tsisi Croek Tributary | | | | Boulder Riffle | 0 | 0 | 0 | |
| I sisi Creek I ributary Riffle 0 0 0 | | | _ , , | Percolation Channel | 0 | 0 | 0 | |
| | | I sisi Creek | Tributary | Riffle | 0 | 0 | 0 | |
| Run 0 0 0 | | | | Run | 0 | 0 | 0 | |

Table-D38. Continued.

| | | | Trout, lake | | |
|-----------------|---|---|-------------------------------------|---|--|
| Stream | Macrohabitat Type | Mesohabitat Type | Early Summer | Late Summer | Fall |
| Susitna River | Main Channel | Run | 0 | 0 | 0 |
| | Main Channel | Run | 0 | 0 | 0 |
| | Side Channel | Pool | 0 | 0 | 0 |
| Susitna River | Side Channel | Riffle | 0 | 0 | 0 |
| | Side Slough | Pool | 0 | 0 | 0 |
| | Split Main Channel | Run | 0 | 0 | 0 |
| Watana Creek | I I rini itary | Beaver Pond | 0 | 0 | 0 |
| | | Boulder Riffle | 0 | 0 | 0 |
| | | Glide | 0 | 0 | 0 |
| | | Percolation Channel | 0 | 0 | 0 |
| | | Pool | 0 | 0 | 0 |
| | | Riffle | 0 | 0 | 0 |
| | | Run | 0 | 0 | 0 |
| | | Boulder Riffle | 0 | 0 | 0 |
| Watana | | Glide | 0 | 0 | 0 |
| Creek | Tributary | Rapid | | 0 | 0 |
| Tributary | | Riffle | 0 | 0 | 1.8 |
| | | Run | 0 | 0 | 0 |
| Unnamed | | Pool | 0 | 0 | 0 |
| Tributary | Tributary | Riffle | 0 | 0 | 0 |
| 194.8 | | Run | 0 | | 0 |
| | Susitna River Susitna River Watana Creek Tributary Unnamed Tributary | Susitna River Main Channel Main Channel Side Channel Side Slough Split Main Channel Tributary Watana Creek Tributary Unnamed Tributary Tributary Tributary Tributary | Susitna River Main Channel Run | Stream Macrohabitat Type Mesohabitat Type Summer Susitna River Main Channel Run 0 Susitna River Main Channel Run 0 Side Channel Pool 0 Riffle 0 Side Slough Pool 0 Split Main Channel Run 0 Beaver Pond 0 0 Boulder Riffle 0 0 Glide 0 0 Percolation Channel 0 0 Riffle 0 0 Riffle 0 0 Riffle 0 0 Rapid 0 0 Run 0 0 Run | Stream Macrohabitat Type Mesohabitat Type Summer Summer Susitna River Main Channel Run 0 0 Susitna River Main Channel Run 0 0 Side Channel Pool 0 0 Riffle 0 0 0 Solide Slough Pool 0 0 Split Main Channel Run 0 0 Beaver Pond 0 0 0 Boulder Riffle 0 0 0 Glide 0 0 0 Percolation Channel 0 0 0 Riffle 0 0 0 Run 0 0 0 Rapid 0 0 Run 0 0 |

^{1.} Jay Creek was a direct-sampling tributary in which non-random site selection was used. See ISR Study 9.5 Section 4.4.2.2 for details. Notes: All data are provisional and subject to ongoing QA/QC. CPUE was calculated within tributaries or mainstem geomorphic reach as an average among sites by habitat type by season: Early Summer (July 13-August 11), Late Summer (August 12-September 9), and Fall (September 10-October 4). Data sources include: GRTS tributary sampling, direct tributary sampling, and mainstem transect sampling.

Table D39. Average CPUE (fish per hour of shocking time) for round whitefish using backpack electrofishing in the Upper River, 2013.

| National Parish Stream Macrohabitat Type Mesohabitat Type Summer Summer Falt | Geo- | | | | W | Whitefish, round | | | | |
|--|---------|------------------------|--------------------|---------------------------------|-----------------|------------------|--------|---|-----|---|
| UR-2 (PRM 234.5- 248.6) | morphic | Stream | Macrohabitat Type | Mesohabitat Type | | | Fall | | | |
| UR-2 (PRM 234.5-248.6) | | | | | 0 | 0 | 0 | | | |
| UR-2 (PRM 234.5-248.6) | | | | Glide | 0 | 0 | 0 | | | |
| River River River River River Rapid Rapid Rapid Rapid Rapid Rapid Riffle Run River River | | | | Percolation Channel | 0 | 0 | 0 | | | |
| Rapid 0 0 0 0 0 0 0 0 0 | | | Tributary | Pool | 0 | | 0 | | | |
| Run | | MINGI | | Rapid | 0 | 0 | 0 | | | |
| Run | | | | Riffle | 0 | 0 | 4.7 | | | |
| Boulder Riffle | | | | Run | 0 | 0 | 0 | | | |
| Black River | , | | | Boulder Riffle | 0 | 0 | 0 | | | |
| Riffle | | DI I D' | T.9. (| Pool | 0 | 0 | 0 | | | |
| Watana Reservoir at Full Pool (PRM 232.5) UR-3 (PRM 224.9- 234.5) Goose Creek Tributary Tri | | Black River | Tributary | Riffle | 0 | 0 | 0 | | | |
| Susitna River Main Channel Riffle 0 4.5 0 | | | | Run | 0 | 0 | 0 | | | |
| UR-3 (PRM 224.9- 234.5) Goose Creek Tributary Susitna River Main Channel Run 0 0 40.8 Pool 0 0.7 0 | | • | Watana Rese | ervoir at Full Pool (PRM 232.5) | • | | | | | |
| UR-3 (PRM 224.9- 234.5) Goose Creek Tributary Run 0 0 40.8 Pool 0 0.7 0 | | Susitna River | Overthe Diver | Overite a Division | Ossaita a Dissa | | Riffle | 0 | 4.5 | 0 |
| (PRM Boulder Riffle 0 0.7 0 224.9- Pool 0 11.5 0 234.5) Goose Creek Tributary Tributary 0 11.5 0 | | | Main Channel | Run | 0 | 0 | 40.8 | | | |
| 224.9- 234.5) Goose Creek Tributary | | Goose Creek | Tributary | Boulder Riffle | 0 | 0.7 | 0 | | | |
| 234.5) Goose Creek Tributary Riffle 0 0 0 | 224.9- | | | Pool | 0 | 11.5 | 0 | | | |
| | 234.5) | | | Riffle | 0 | 0 | 0 | | | |
| Run 0 1.6 0 | | | | Run | 0 | 1.6 | 0 | | | |
| Clearwater Plume Clearwater Plume 0 0 6.1 | | | Clearwater Plume | Clearwater Plume | 0 | 0 | 6.1 | | | |
| Susitna River Main Channel Run 0 1.4 0 | | Susitna River | Susitna River | Main Channel | Run | 0 | 1.4 | 0 | | |
| Split Main Channel Run 0 4.0 0 | | | Split Main Channel | Run | 0 | 4.0 | 0 | | | |
| Pool 0 0 0 | | | | Pool | 0 | 0 | 0 | | | |
| Jay Creek¹ Tributary Riffle 0 0 | | Jay Creek ¹ | Tributary | Riffle | 0 | 0 | 0 | | | |
| UR-4 Run 0 0 0 | LID 4 | | | Run | 0 | 0 | 0 | | | |
| OR-4 (PRM Boulder Riffle 0 0 0 | | | | Boulder Riffle | 0 | 0 | 0 | | | |
| 208.1- Glide 0 | 208.1- | | T " (| Glide | | | 0 | | | |
| 224.9) Kosina Creek Tributary Riffle 0 0 0 | 224.9) | Kosina Creek | Tributary | Riffle | 0 | 0 | 0 | | | |
| Run 0 0 0 | | | | Run | 0 | 0 | 0 | | | |
| Boulder Riffle 0 0 0 | | | | Boulder Riffle | 0 | 0 | 0 | | | |
| | | | | Percolation Channel | 0 | 0 | 0 | | | |
| Tsisi Creek Tributary Riffle 0 0 0 | | Tsisi Creek | Tributary | Riffle | 0 | 0 | 0 | | | |
| Run 0 0 0 | | | | Run | 0 | 0 | 0 | | | |

Table-D39. Continued.

| Geo- | | | | | hitefish, round | |
|----------------------------------|-----------------|--------------------|------------------------------|-----------------|-----------------|------|
| morphic Reach | Stream | Macrohabitat Type | Mesohabitat Type | Early Summer | Late Summer | Fall |
| UR-5 (PRM 203.4- 208.1) | Susitna River | Main Channel | Run | 0 | 0 | 3.4 |
| | | Main Channel | Run | 1.4 | 0 | 0 |
| | | Side Channel | Pool | 0 | 0 | 0 |
| | Susitna River | Side Channel | Riffle | 13.7 | 0 | 6.2 |
| | | Side Slough | Pool | 5.0 | 0 | 0 |
| | | Split Main Channel | Run | 0 | 0 | 0 |
| | | I I ribilitary | Beaver Pond | 0 | 0 | 0 |
| | | | Boulder Riffle | 5.4 | 3.7 | 0 |
| | | | Glide | 0 | 0 | 0 |
| UR-6 | Watana Creek | | Percolation Channel | 0 | 0 | 0 |
| (PRM | Orcon | | Pool | 0 | 0 | 0 |
| Ì87.1- | | | Riffle | 3.7 | 1.3 | 0 |
| 203.4) | | | Run | 0 | 0 | 0 |
| | | | Boulder Riffle | 0 | 0 | 0 |
| | Watana | | Glide | 0 | 0 | 0 |
| | Creek | Tributary | Rapid | | 0 | 0 |
| Tributary | | Riffle | 0 | 0 | 0 | |
| | | | Run | 0 | 0 | 0 |
| | Unnamed | | Pool | 0 | 0 | 0 |
| | Tributary | Tributary | Riffle | 0 | 0 | 0 |
| | 194.8 | | Run | 0 | | 0 |
| | | Proposed Wata | ana Dam Location (PRM 187.1) | | | |

^{1.} Jay Creek was a direct-sampling tributary in which non-random site selection was used. See ISR Study 9.5 Section 4.4.2.2 for details. Notes: All data are provisional and subject to ongoing QA/QC. CPUE was calculated within tributaries or mainstem geomorphic reach as an average among sites by habitat type by season: Early Summer (July 13-August 11), Late Summer (August 12-September 9), and Fall (September 10-October 4). Data sources include: GRTS tributary sampling, direct tributary sampling, and mainstem transect sampling.

Table D40. Average CPUE (fish per hour of shocking time) for round whitefish using boat electrofishing in the Upper River, 2013.

| | | | Whitefish, round | | |
|---------------------------|--------------------|-------------------------------|------------------|----------------|------|
| Geomorphic Reach | Macrohabitat Type | Mesohabitat Type | Early Summer | Late Summer | Fall |
| | Watana | Reservoir at Full Pool (PRM 2 | 32.5) | | |
| UR-3 | Main Channal | Riffle | 0 | 0 | 11.7 |
| (PRM 224.9-234.5) | Main Channel | Run | 0 | 0 | 15.5 |
| UR-4 (PRM 208.1-224.9) | Clearwater Plume | Clearwater Plume | | 0 | 4.0 |
| | Main Channel | Run | 0 | 2.7 | 2.5 |
| (FRIVI 200.1-224.9) | Split Main Channel | Run | 0 | 0 | 7.3 |
| UR-5 (PRM 203.4-208.1) | Main Channel | Run | 0 | 0 | 15.4 |
| | Main Channel | Run | 0 | 2.3 | 6.4 |
| UR-6 (PRM 187.1-203.4) | Side Slough | Pool | 0 | 0 | 0 |
| (FIXIVI 107.1-203.4) | Split Main Channel | Run | 0 | 0 | 22.3 |
| | Proposed | Watana Dam Location (PRM | 187.1) | | |

Table D41. Average CPUE (fish per 1,000 square meters) for round whitefish using seining in the Upper River, 2013.

| | | | | Whitefish, round | | |
|-------------------------------|------------------|--------------------|--------------------------|------------------|----------------|------|
| Geomorphic Reach | Stream | Macrohabitat Type | Mesohabitat Type | Early Summer | Late Summer | Fall |
| UR-2 | | | Pool | 0 | | |
| (PRM 234.5- | Oshetna River | Tributary | Riffle | 0 | | |
| 248.6) | INVE | | Run | 0 | | |
| | | Watana Reservoir | at Full Pool (PRM 232.5) | | | |
| UR-4 (PRM 208.1- 224.9) | Susitna River | Main Channel | Run | 0 | | |
| | | Main Channel | Run | 1.4 | 3.3 | 0 |
| LID C | Overite a Divers | 0.1.01 | Pool | 0 | 0 | 0 |
| UR-6 (PRM 187.1- | Susitna River | Side Channel | Riffle | 4.7 | | 5.1 |
| 203.4) | | Split Main Channel | Run | 2.6 | 0 | 2.1 |
| | Watana Creek | Tributary | Riffle | 0 | | |
| | • | Proposed Watana D | am Location (PRM 187. | 1) | <u> </u> | |

Table D42. Average CPUE (fish per 1,000 square meters) for round whitefish using snorkeling in the Upper River, 2013.

| | | | | Whitefish, round | |
|---------------------|------------------------|-------------------------------|---------------|------------------|------|
| Geomorphic Reach | Stream | Mesohabitat Type | Early Summer | Late Summer | Fall |
| | T | Watana Reservoir at Full Pool | | | |
| UR-3 | | Boulder Riffle | 2.0 | 0 | 0 |
| (PRM 221.9- | Goose Creek | Pool | 5.0 | 9.4 | 0 |
| 234.5) | Ooose Creek | Riffle | 0 | | 0 |
| | | Run | 0.7 | 11.5 | 0 |
| | Jay Creek ¹ | Pool | 0 | 0 | 0 |
| | Jay Creek | Run | 0 | 0 | 0 |
| | | Boulder Riffle | 0.4 | 0 | 0 |
| UR-4 | Kosina Creek | Glide | | | 0 |
| (PRM 208.1- | | Run | | 0 | 0 |
| 224.9) | Tsisi Creek | Boulder Riffle | 0 | 0 | 0 |
| | | Percolation Channel | 0 | 0 | 0 |
| | | Riffle | 1.8 | 0 | 0 |
| | | Run | 0.7 | 0 | 0 |
| | Watana Creek | Beaver Pond | 0 | 0 | 0 |
| | | Boulder Riffle | 1.7 | 0 | 0 |
| | | Pool | 3.3 | 0 | 0 |
| | | Riffle | 0.4 | 0 | 0 |
| UR-6 | | Run | 0 | 0 | 0 |
| (PRM 187.1- | | Boulder Riffle | | 0 | 0 |
| 203.4) | Watana Creek | Rapid | | 3.3 | 0 |
| , | Tributary | Riffle | 1.8 | 0.3 | 0 |
| | | Run | 0 | 0 | 0 |
| | | Pool | 0 | 0 | |
| | Unnamed | Riffle | 0 | 0 | |
| | Tributary 194.8 | Run | 0 | 0 | |
| | | Proposed Watana Dam Locatio | n (PRM 187.1) | L | |

^{1.} Jay Creek was a direct-sampling tributary in which non-random site selection was used. See ISR Study 9.5 Section 4.4.2.2 for details. Notes: All data are provisional and subject to ongoing QA/QC. CPUE was calculated within tributaries as an average among sites by habitat type by season: Early Summer (July 13-August 11), Late Summer (August 12-September 9), and Fall (September 10-October 4). Data sources include: GRTS tributary sampling and direct tributary sampling.

Table D43. Average CPUE (fish per 1,000 square meters) for undifferentiated whitefish species using snorkeling in the Upper River, 2013.

| | | | White | itefish, undifferentiated | | |
|---------------------|-----------------|-----------------------------|------------------|---------------------------|------|--|
| Geomorphic Reach | Stream | Mesohabitat Type | Early Summer | Late Summer | Fall | |
| | _ | Watana Reservoir at Full Po | | | | |
| UR-3 | | Boulder Riffle | 0 | 0 | 0 | |
| (PRM 221.9- | Goose Creek | Pool | 0 | 0 | 0 | |
| 234.5) | Goose Creek | Riffle | 0 | | 0 | |
| | | Run | 0 | 0 | 0 | |
| | Jay Creek1 | Pool | 0 | 0 | 0 | |
| | Jay Creek | Run | 0 | 0 | 0 | |
| | | Boulder Riffle | 0 | 0 | 0 | |
| UR-4 | Kosina Creek | Glide | | | 0 | |
| (PRM 208.1- | | Run | | 0 | 0 | |
| 224.9) | Tsisi Creek | Boulder Riffle | 0.3 | 0 | 0 | |
| | | Percolation Channel | 0 | 0 | 0 | |
| | | Riffle | 0 | 0 | 0 | |
| | | Run | 0 | 0 | 0 | |
| | Watana Creek | Beaver Pond | 0 | 0 | 0 | |
| | | Boulder Riffle | 0 | 0 | 0 | |
| | | Pool | 0 | 0 | 0 | |
| | | Riffle | 0 | 0 | 0 | |
| UR-6 | | Run | 0 | 0 | 0 | |
| (PRM 187.1- | | Boulder Riffle | | 0 | 0 | |
| 203.4) | Watana Creek | Rapid | | 0 | 0 | |
| · | Tributary | Riffle | 0 | 0 | 0 | |
| | | Run | 0 | 0 | 0 | |
| | | Pool | 0 | 0 | | |
| | Unnamed | Riffle | 0 | 0 | | |
| | Tributary 194.8 | Run | 0 | 0 | | |
| | 1 | Proposed Watana Dam Locat | tion (PRM 187 1) | | | |

^{1.} Jay Creek was a direct-sampling tributary in which non-random site selection was used. See ISR Study 9.5 Section 4.4.2.2 for details. Notes: All data are provisional and subject to ongoing QA/QC. CPUE was calculated within tributaries as an average among sites by habitat type by season: Early Summer (July 13-August 11), Late Summer (August 12-September 9), and Fall (September 10-October 4). Data sources include: GRTS tributary sampling and direct tributary sampling.