

## **SUMMARY OF 2013 FIELD PROJECT**

### **STREAM FISH AND AQUATIC HABITAT SURVEYS, KVICHAK AND NUSHAGAK RIVER WATERSHEDS**

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## **OBJECTIVES**

1. Perform intensive sampling on streams tributary to the Kvichak and Mulchatna rivers and to the southwestern half of Iliamna Lake to provide data on spatial variation necessary to fit spatial estimation and prediction models.
2. Record characteristics of aquatic and riparian habitats at each sampling location such that sufficient information is documented to provide field-measured covariates to relate to digital spatial data.
3. Report observations of anadromous fish to the State of Alaska's Catalog of Waters Important for the Spawning, Rearing or Migration of Anadromous Fishes (Anadromous Waters Catalog; AWC).

## **PROCEDURES**

1. Sampled locations were selected to maximize the increase in understanding of landscape controls on fish distribution.
2. We deployed helicopter-supported teams to sampling wadeable streams and riverboat and raft teams to sample non-wadeable streams.
3. We sampled local fish assemblages with standardized methods developed by Wiedmer (2003; 2006) and currently used by ADF&G (e.g., Buckwalter et al. 2012). Electrofishing was our primary fish collection method, supplemented with ground, boat, and aerial observations, underwater video, and angling. See Wiedmer (2013) for details.
4. We measured a suite of local water chemistry, channel morphology, and riparian habitat parameters at each sample site. We archived the information in a spatially explicit database developed by Wiedmer and Wallis (Wiedmer 1999), which remains in use today (ADF&G 2014).
5. Access authorization was granted by the National Park Service for activities within Katmai National Park and Preserve and the Alagnak Wild and Scenic River corridor. Our activities within these NPS units were coordinated daily.

## **RESULTS**

1. Our field operations for the project were based in Igiugig.
2. Field sampling was conducted from August 10–28, 2013. Field crew identified in Table 1.
3. We collected waterbody information at 348 unique locations (Figure 1) along streams appearing in the National Hydrography Dataset:
  - a. We made systematic fish observations at 167 locations (Table 2).
  - b. We recorded barrier (actual or potential) information at 181 locations
    - i. 173 cross-channel beaver dams.
    - ii. 4 no surface flow.
    - iii. 4 waterfalls.
  - c. No specimens or artifacts were retained, all fish were returned at the capture site.
  - d. No materials or structures were installed or left in the field.

**Table 1.-Field crew.**

| Name             | Title                         | Representing                               | Field dates |
|------------------|-------------------------------|--------------------------------------------|-------------|
| Daniel Chythlook | IGAP Coordinator              | Aleknagik Traditional Council              | 8/10-28     |
| Tim Troll        | Executive Director            | Bristol Bay Heritage Land Trust            | 8/10-28     |
| Michael Wiedmer  | Principal                     | Malma Consulting                           | 8/10-28     |
| David Albert     | Conservation Science Director | The Nature Conservancy in Alaska           | 8/13-19     |
| Christine Woll   | Spatial Ecologist             | The Nature Conservancy in Alaska           | 8/20-28     |
| Marcus Geist     | Principal                     | Artesian Knowledge LLC                     | 8/23-28     |
| Chris Wagemann   | Biologist                     | Washington Department of Fish and Wildlife | 8/20-24     |
| Carmen Wagemann  | Volunteer                     | Bristol Bay Heritage Land Trust            | 8/20-24     |
| Damon Allen      | Pilot                         | Coastal Helicopters                        | 8/10-28     |
| Russell Owen     | Guide                         | Alaska Trophy Adventures                   | 8/26-28     |

## PRODUCTS

1. Linked records (including 1193 spatially explicit images) will be posted on the Alaska Freshwater Fish Inventory website (ADF&G 2014).
2. 21 nominations submitted to the AWC (e.g., Johnson and Daigneault 2013); including 100s of kilometers of previously undocumented salmon spawning and rearing habitat.
3. Extensive new data on stream habitats and fish assemblages for use in models estimating relations between landscape variables and local fish assemblages and for predicting fish assemblages in unsampled locations.

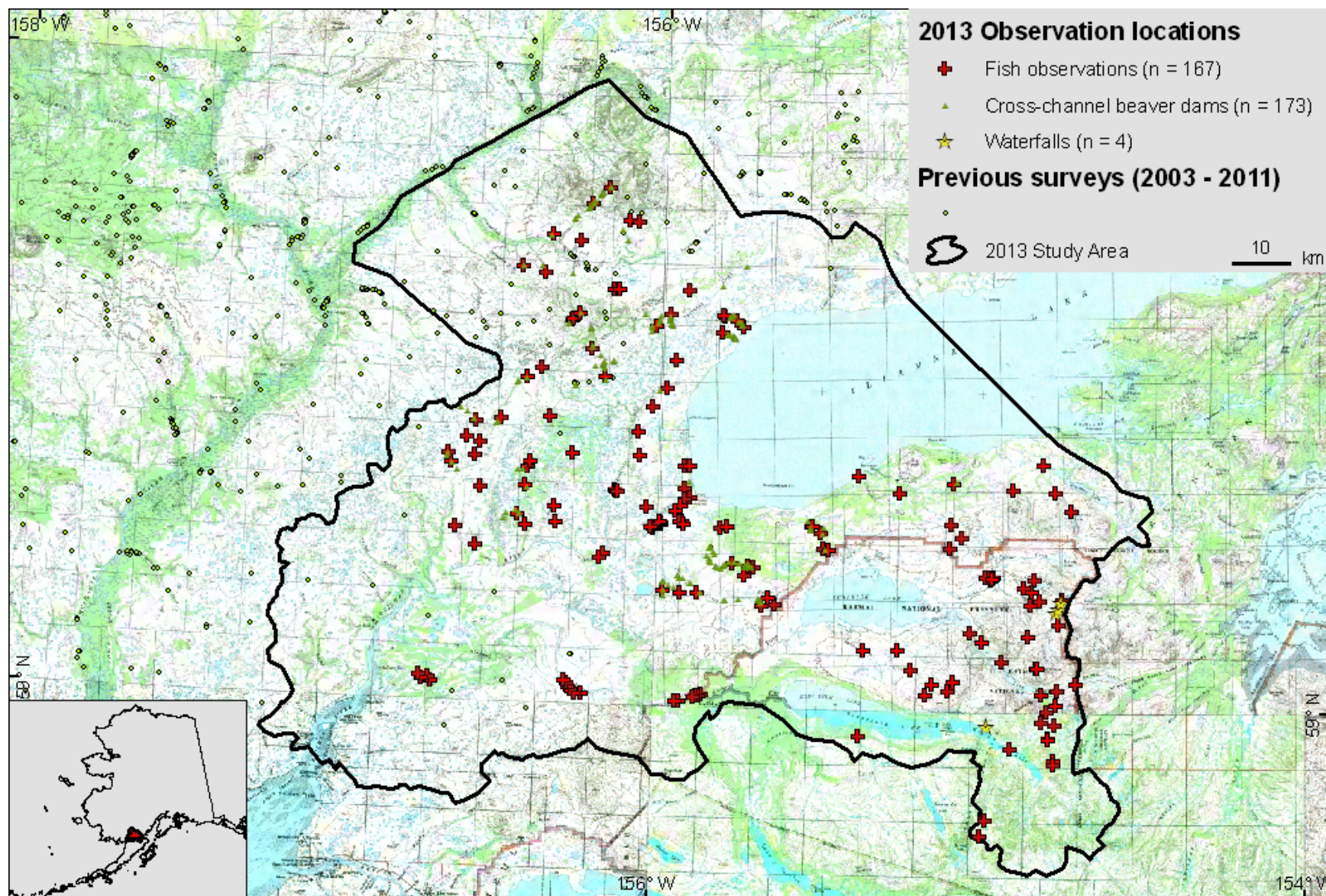


Figure 1.-Locations of waterbody observations within the 2013 lower Kvichak and Mulchatna river watersheds study area.

**Table 2.-Fish collected or observed.**

| Name                                        |                                                            | Observations |                 |
|---------------------------------------------|------------------------------------------------------------|--------------|-----------------|
| Common                                      | Scientific                                                 | Sites (n)    | Individuals (n) |
| sculpin <sup>1</sup>                        | <i>Cottus sp.</i>                                          | 115          | 1736            |
| coho salmon                                 | <i>Oncorhynchus kisutch</i>                                | 62           | 650             |
| rainbow trout                               | <i>O. mykiss</i>                                           | 61           | 440             |
| Dolly Varden                                | <i>Salvelinus malma</i>                                    | 43           | 526             |
| Arctic grayling                             | <i>Thymallus arcticus</i>                                  | 38           | 224             |
| ninespine stickleback                       | <i>Pungitius pungitius</i>                                 | 31           | 358             |
| sockeye salmon                              | <i>O. nerka</i>                                            | 29           | 6406            |
| Arctic-Alaskan brook lamprey paired species | <i>Lethenteron camtschaticum/L. alaskense</i> <sup>2</sup> | 24           | 131             |
| chum salmon                                 | <i>O. keta</i>                                             | 23           | 594             |
| Chinook salmon                              | <i>O. tshawytscha</i>                                      | 19           | 468             |
| Alaska blackfish                            | <i>Dallia pectoralis</i>                                   | 16           | 34              |
| threespine stickleback                      | <i>Gasterosteus aculeatus</i>                              | 14           | 202             |
| round whitefish                             | <i>Prosopium cylindraceum</i>                              | 12           | 18              |
| coastrange sculpin                          | <i>Cottus aleuticus</i>                                    | 8            | 13              |
| longnose sucker                             | <i>Catostomus catostomus</i>                               | 6            | 10              |
| lake trout                                  | <i>Salvelinus namaycush</i>                                | 5            | 41              |
| pond smelt                                  | <i>Hypomesus olidus</i>                                    | 5            | 77              |
| starry flounder                             | <i>Platichthys stellatus</i>                               | 4            | 17              |
| slimy sculpin                               | <i>Cottus cognatus</i>                                     | 4            | 4               |
| least cisco                                 | <i>Coregonus sardinella</i>                                | 4            | 7               |
| pink salmon                                 | <i>O. gorbuscha</i>                                        | 2            | 3               |
| northern pike                               | <i>Esox lucius</i>                                         | 1            | 1               |
| No fish observed                            |                                                            | 11           | 0               |
| Grand Total                                 |                                                            |              | 11,963          |

<sup>1</sup> The two extant freshwater sculpin species, slimy and coastrange, are not reliably and consistently distinguished in field collections and are combined here. Those individual sculpin identified to species are reported separately in Table 1.

<sup>2</sup> Nomenclature follows Brown et al. (2009).

## REFERENCES CITED

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