KPFHP Meeting 3/5/18 KWF Office

Attendance

In Person Jack Sinclair, Kyle Graham, Tami Murray, Marcus Mueller, Dr. John Morton, Brian Blossom

Call in Erika Ammann, Jess Johnson, Christy Cincotta, Marie McCarty

- Agenda reviewed and approved with no objection.
- February 5, 2018 meeting minutes approved with date change on heading.

Old Business

Annual Meeting February 12, 2018 Review

Jack: Looking for feedback

Kyle: liked having Robert give the history of the partnership, level of confidence was great to hear. The policy discussion very beneficial.

Jack: Hope to have an annual meeting every year, good to hear what's going on with partnership, will block out a date in February 2019.

New Business

2017 Annual report for NFHP – KPFHP Summary review – (Last Year's attached)

Kyle: Who is the audience, general public document? Can it be more impactful in the future?

Steering Committee recruitment

Jack: Need a note of intent for anyone running by Mid May
Sue Mauger term expiring
Marie McCarty term expiring

Long Term Aquatic Invasive Management, Kyle Graham, Dr. John Morton (KNWR, Jennifer Hestor (KWF)

Kyle: Invasives #1 priority on CAP. Review refuge priority, what is being done on non-refuge systems. Propose long term design, make sure we aren't missing any lakes. More proactive approach with updated map.

Dr. Morton: 5 infestations, 3 eradicated in 15/16, 2 new in 2017. 150 lakes have been investigated. All treated or eradicated. Key to keep it out of Peninsula, faster detection, cheaper to eradicate. Federal land ok the worry is the private, partnership should make a priority.

Monitor
New lakes, checkups on all lakes, float planes bringing it in
High use lakes with public boat launches and float planes. More help from locals, Jennifer Hester would be the logical lead/coordinator.

Marcus: Perhaps partner with ADF&G with a section in the fishing/hunting regulations on detection and who to report to.

Kyle: EVOST get funding preapproved in case of an outbreak. Timing is critical, preapproved funding would help in permitting process.

Member comments

Marcus: No comments
Brian: No comments
Kyle: No news on proposals, timeiline March begin review process
Jess: signoff
Erika: No comments
Marie: Thank you John for presentation
Christie: Thanks for the info, trying to expand eldoia efforts on West side.
Jack: Thanks everyone
Next Meeting April 2, 2018

Adjournment 3:08 PM
Respectfully submitted by
Tami Murray
Development Director KWF

Communications & Outreach	The Mat-Su Salmon Partnership was busy in 2016 working toward our its strategic goals, and bringing partners together to information share, collaborate and further our collective salmon conservation efforts. The Partnership highlighted the great work of partners through outreach efforts that included our a second annual summer site tour of projects for community leaders, partnered on our a second year in a community fish and wildlife lecture series to reach community and college age audiences, and hosted our its 9th annual Mat-Su Salmon Science & Conservation Symposium.
Science	Themed A Future with Salmon, Symposium keynote Dr. Daniel Schindler, professor from University of Washington's School of Aquatic Fishery Sciences, highlighted his research on the 'portfolio effect' whereby the diversity of salmon streams and salmon stocks that return to them leads to overall enhanced stability of annual salmon returns to the region. There were over 25 presenters at the Symposium with nearly 100 people each day. Presenters highlighted their efforts in 2016 including 101 miles on 53 streams gaining greater conservation protection through state law by being added to the Anadromous Waters Catalogue; replacement of two culverts that impaired fish passage and opening-up over 13 stream miles of upstream habitat, as well as numerous fish and habitat assessments that are improving our knowledge of important habitats for juvenile salmon, and effects of climate change on stream temperature.
Conservation & Restoration	Additionally, partners mapped shoreline impacts on priority waterbodies in the Mat-Su; began eradication efforts for Elodea, Alaska's first submerged freshwater invasive plant, discovered in remote Alexander Lake; and partnering on a mapping project intended to bring the updated Mat-Su Stream maps into the Anadromous Waters Catalogue in 2017. Through a cost share program partners removed 572 feet of structures detrimental to juvenile salmon and conserved and sustained 5,054 square feet of healthy nearshore fish habitat and riparian vegetation on three priority locations. In 2016 the Partnership along with other Alaska Fish Habitat Partnerships worked with the University of Alaska to support a statewide Salmon and Society workshop on long term challenges to Alaska's salmon and salmon dependent communities.

Building an Index Watershed Program to track land use and climate impacts

Phase 1

Prepared by
Sue Mauger
Cook Inletkeeper
for the
Kenai Peninsula Fish Habitat Partnership
January 2018

Introduction

In 2011-2012, the Kenai Peninsula Fish Habitat Partnership enlisted local scientists and resource managers to develop a Conservation Action Plan (CAP) to help guide strategic actions by the Partnership. The CAP in conjunction with the Partnership's Strategic Plan are the foundations for the Steering Committee's decision making in providing project funding. Based on information from surveys, monitoring and personal observations over the past several decades, the science team members collectively ranked the highest critical threats to freshwater habitat within the Kenai Peninsula Borough as:

- injurious invasive aquatic species,
- warming climate,
- incompatible road development, and
- residential development in riparian areas.

Five freshwater habitat types were identified as having a medium or higher threat status in the Kenai Peninsula Borough: lowland, groundwater/wetland-dominated system; non-glacial, mountain rivers; glacial river with lakes; closed-basin lakes, and clearwater lakes with streams (see Table 1). Since these habitats are scattered across the Peninsula, they are subject to varying degrees of threat. The CAP provides a valuable framework for the Partnership but lacks specificity for guiding annual project priorities.

Table 1. Freshwater potential threats ranking table across habitat types in the Kenai

	Potential Threats Across Targets	Steep coastal streams	Non-glacial mountain rivers	Glacial rivers w/o lakes	Glacial rivers w/ lakes	Lowland groundwater/wetland-dominated systems	Closed-basin lakes	Clearwater connected lakes with associated streams	Overall Threat Rank
	Project-specific threats	1	2	3	4	5	6	7	
1	Injurious aquatic invasive species				Low	High	High	High	High
2	Warmer climate		Medium		Low	Medium	Medium	Medium	Medium
3	Incompatible road development		Low	Medium	Low	Medium		Low	Medium
4	Residential development in riparian zone				Medium	Medium			Medium
5	Hydro development	Low	Medium	Low	Low			Low	Low
6	Incompatible mining	Low	Low			Medium			Low
7	Catastrophic spill (vehicle, tank farm, pipeline)				Low	Medium			Low
8	Urbanization/development outside the riparian zone				Low	Medium			Low
9	Incompatible ORV use					Medium			Low
	Threat Status for Targets and Project	Low	Medium	Low	Medium	High	Medium	Medium	Medium

- **Many others noted, with a low rank.**

Peninsula Borough.

Index Watersheds

By building an index watershed program around key systems, the Kenai Peninsula Fish Habitat Partnership can assess the status of each threat and/or develop a plan for how to evaluate the threat status. Local scientists and resource managers involved in developing the CAP can help develop recommendations about which actions: restoration, protection, education or legislation, would be most effective in addressing the threat status. The assessment and recommendations will provide the Partnership with guidance about which threat in each conservation target is the highest priority for Partnership future activities. By focusing attention on an index watershed and addressing its specific issues, the Partnership will be better informed about how to address these same issues in similar watersheds.

The Partnership's Steering Committee may want to recruit local scientists and resource managers to form a Science and Data Committee to work with partner organizations and further develop a long-term index watershed program. Initially an index watershed should be selected from each of the five freshwater habitat types identified as having a medium or higher threat status. The selection of each index watershed should be based on multiple criteria, including:

- relative importance of the watershed to salmon;
- how representative the watershed is to other Kenai Peninsula Borough streams;
- how vulnerable the watershed is to human activities and climate change; and

- the type and amount of scientific data previously collected within the watershed.

Habitat Types

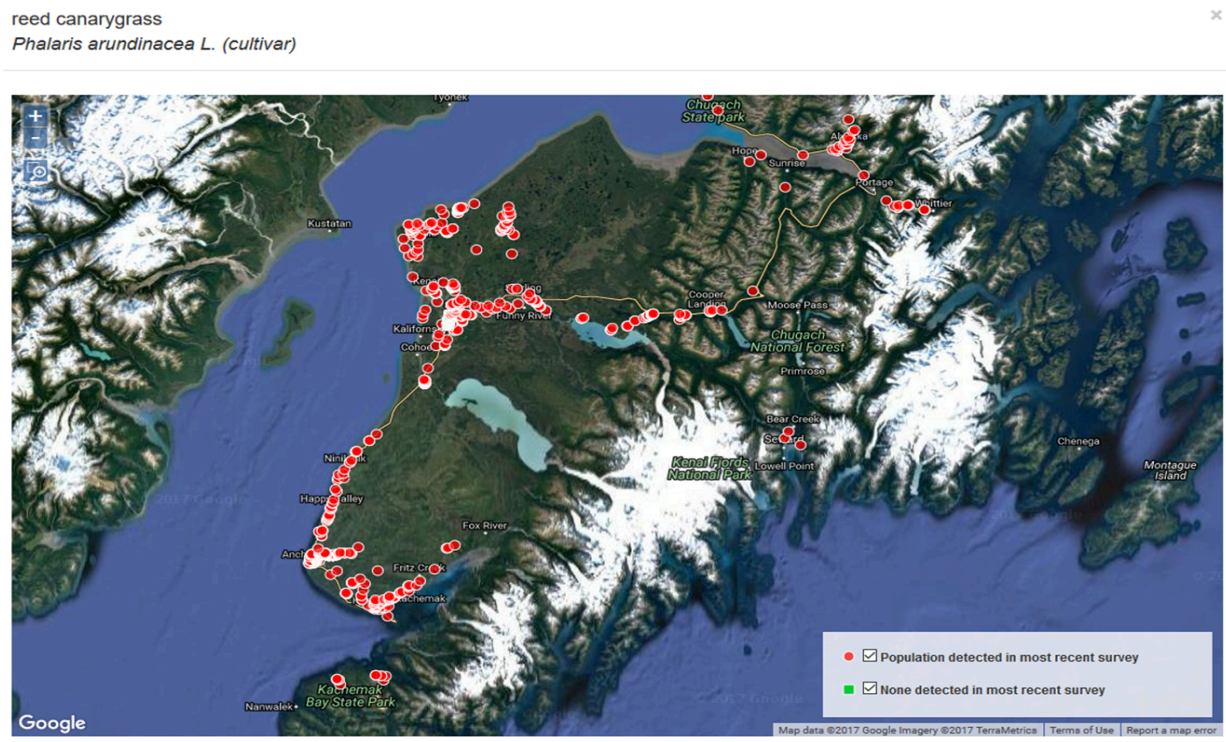
Below is a description of the four freshwater stream habitats identified through the CAP as most vulnerable to potential threats. We have not developed an assessment for the closed-basin lakes in this report. For each stream habitat, we have identified a potential index watershed that meets the criteria above and provided a description of its current threat status based on available data (summarized in Table 2).

Threat assessment tools

When available, we used spatially explicit information to assess threat status within watersheds. To assess threats from injurious aquatic invasive species we consulted the Alaska Exotic Plants Information Clearinghouse (AKEPIC) Data Portal (see Map 1) for species distribution and the Kenai Peninsula Cooperative Weed Management Area Strategic Plan (2007) for management recommendations. To assess impacts from climate change, we used available stream temperature data from partners (Figure 1) and relevant research on climate change implications (Mauger et al. 2017, Schoen et al. 2017). We looked at the ADF&G Fish Resource Monitor, which is on online mapper for fish passage, to assess evidence of incompatible road development (Map 2). We did not identify a good source of information to quantify residential development in riparian areas. Impervious cover would be an appropriate metric for assessment but this data layer is not available at present.

Potential Threats Across Targets	**Non-glacial mountain rivers** **Resurrection Creek (near Hope)**	**Glacial rivers w/lakes** **Kenai River (Skilak Lake to mouth)**	**Lowland groundwater/ wetland dominated systems** **Anchor River**	**Clearwater connected lakes with associated streams** **Russian River & Lakes**
Injurious Aquatic Species **Reed Canary Grass**	Last Survey: 2011 (AACD IPC) Discrete & Open Contain Minimal infestation	Last Survey: 2008 (KWF) Connected & Open Control Wide spread	Last survey: 2009 – 2010 (HSWCD) Discrete & Open Contain Wide spread esp. on North Fork	Last Survey: 2005 (USFS) Connected & Open Eradicate Minimal infestation
Warmer Climate	CIK Data: 2008-2012 USFS Data: 2013 – 2017	USGS Data: Kenai @ Skilak 1998 - 2001 Kenai @Soldotna 1998 – 2001 2014 - 2017	CIK Data: 2002 – 2017 Real-time site: 2013 – 2017	EPSCoR Data: 2015 - 2016 Real-time site: 2017
Incompatible Road Development	No problem culverts	5 red culverts on tribs 6 gray culverts on tribs	6 red culverts 1 gray culvert	No culverts
Residential Development in Riparian Zone	Residential development limited	Kenai River Center ?	No current data - Impervious cover analysis (2003)	Wilderness area – no residential development, but riparian impacts exist

Table 2. Assessment matrix for potential index watersheds and highest ranked threats.



Map 1. Occurrence of reed canarygrass (*Phalaris arundinacea*) in the Kenai Peninsula Borough (AKEPIC data portal: http://aknhp.uaa.alaska.edu/apps/akepic/).

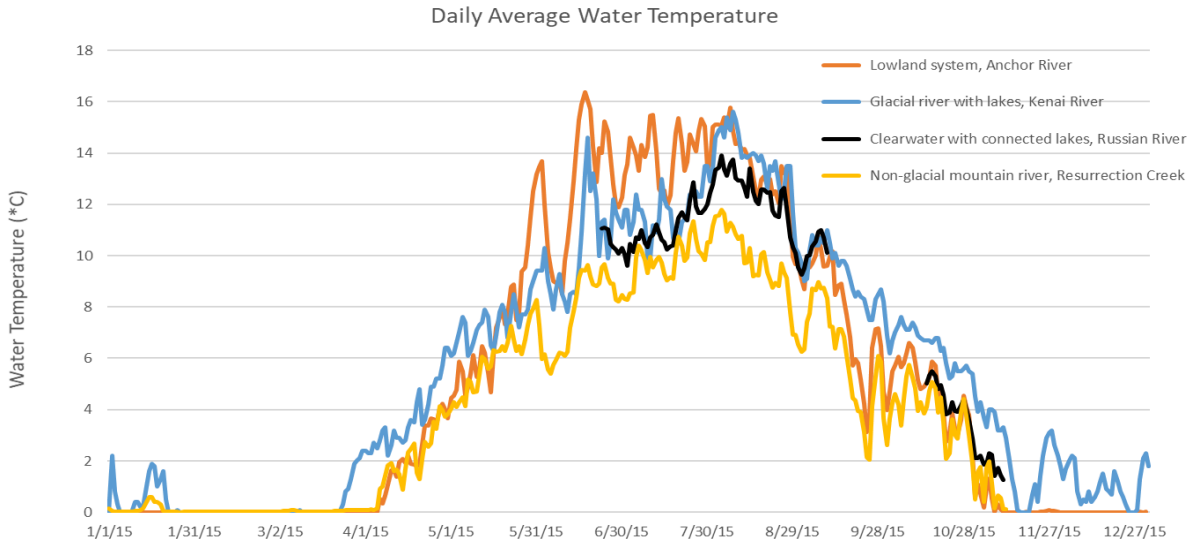
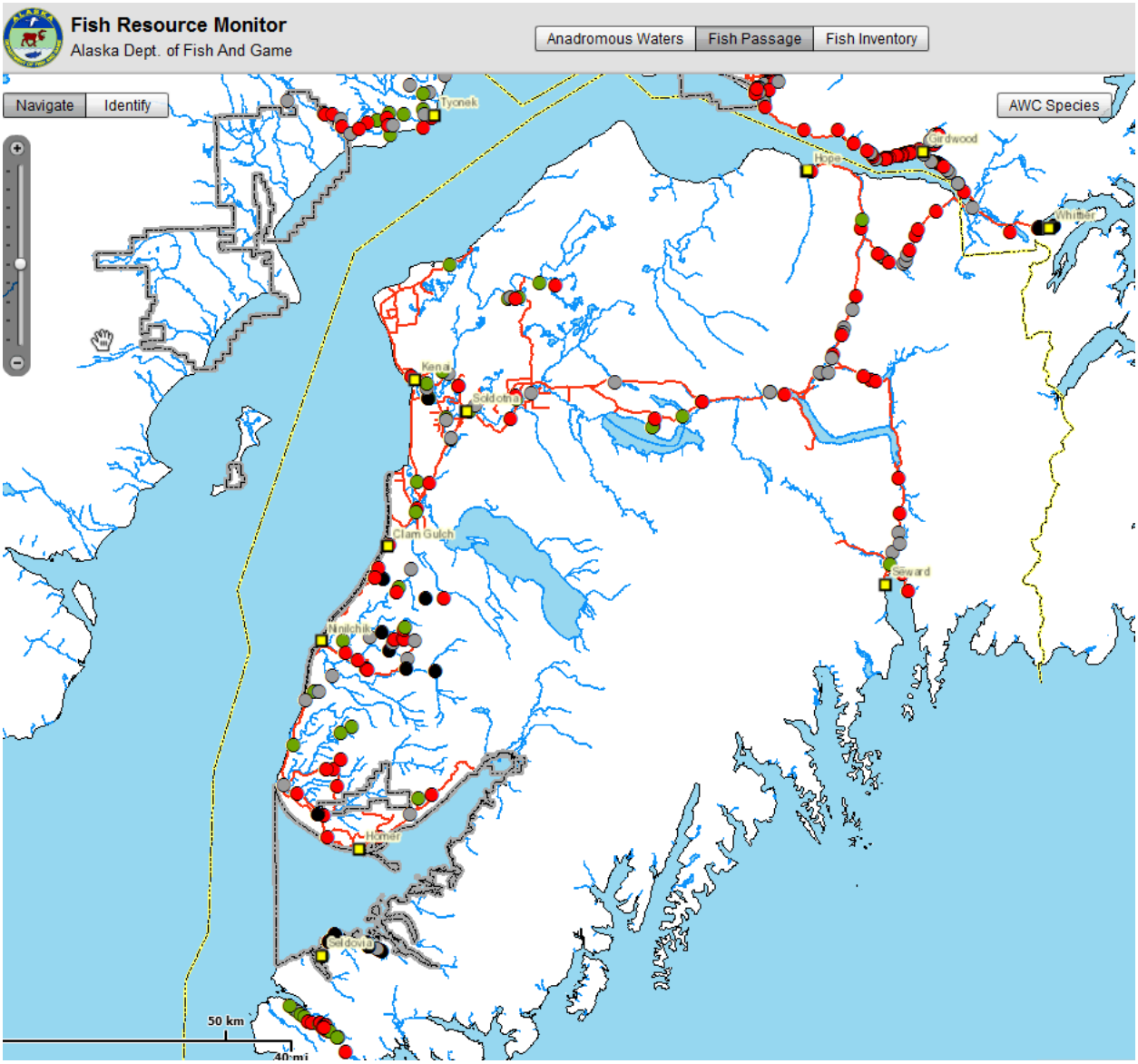


Figure 1. Stream temperature data from 2015 for different stream types.



Map 2. Inventory of culverts at road-stream crossings that may be barriers to the upstream movement of juvenile salmon and resident fish. Culverts are classified into categories based upon whether conditions were assumed not adequate for fish passage (red), required further analysis (gray), or were assumed adequate for fish passage (green). http://extra.sf.adfg.state.ak.us/FishResourceMonitor/?mode=culv

Non-glacial mountain streams

These streams and rivers follow typical dendritic morphology with small high gradient tributary streams joining to form larger streams and rivers that gradually increase in size and decrease in gradient over their course. These rivers and streams typically provide spawning and rearing habitat for chinook and coho salmon. Hydrographs usually peak in spring and early summer with peaks in snowmelt run-off, but can also experience peaks during freshets associated with rainfall

events, typically in the fall. Water temperatures in these streams and rivers are likely resilient to changes in air temperature; however, in the future, these systems may see significant changes in snowpack contributions to stream flow.
These systems typically have limited residential development because they occur within the Chugach National Forest, Kenai National Wildlife Refuge, or on the sparsely populated West side of Cook Inlet. Hydropower development and incompatible mining are likely additional threats to these types of habitat. Examples of non-glacial mountain streams include the Chuit River, Sixmile Creek, Quartz Creek, Resurrection Creek, Ptarmigan Creek, Juneau Creek.

Potential index watershed

Resurrection Creek (near Hope) – increasingly popular fishing, camping and recreational area with new residential and road development. Most of the watershed is managed by the U.S. Forest Service (USFS) with active mining and logging activity. Stream temperature data are available back to 2008 with ongoing monitoring by USFS staff. There are no known fish passage issues with culverts in the watershed and a minimal infestation of reed canary grass.

Glacial rivers with lakes

These streams are fed by glacial melt and have hydrographs that peak during the summer. The large lakes associated with some of these rivers (Kenai Lake, Skilak Lake, Tustumena Lake) act as buffers to rapid changes in streamflow and changes in temperatures. Water temperatures in these streams and rivers are likely resilient to changes in air temperature as glacial melt cools the river in the hottest part of the summer. Examples of glacial river with lake include Kenai River, Kasilof River, Crescent River (west side Cook Inlet), and Bradley River.

Potential index watershed

Kenai River (main channel; Skilak Lake to river mouth) - Residential development and recreational fishing pressure are high along this part of the river. Reed canary grass is widespread with little chance of complete eradication. Fish passage problems are found in the tributaries to the main channel. Temperature and stream discharge are available online through USGS. There are known water quality concerns (turbidity). Good partner capacity and previous Partnership support of project work by the Kenai Watershed Forum.

Lowland groundwater/wetland dominated systems

These streams and rivers provide spawning and rearing habitat for most salmonid species. Hydrographs usually peak in spring and early summer with peaks in snowmelt run-off, but can also experience peaks during freshets associated with rainfall events, typically in the fall. Water temperatures in these streams are closely linked to increases in air temperature. Roads and residential development are prevalent in these types of systems as are a long list of potential threats giving these systems the highest ranked threat status (Figure 1). Examples of lowland systems include Anchor River, Deep Creek, Ninilchik River, Stariski Creek, Chickaloon River, Swanson River.

Potential index watershed

Anchor River – Significant historic and current data exists for this river. Many stakeholders have invested research and restoration efforts in this watershed, which

still supports an important sport fishery despite many threats including residential and road development. Reed canary grass is wide spread and a number of culvert pose fish passage issues.

Clearwater connected lakes with associated streams

Lakes are a primary hydrologic influence - if lakes were missing, the system would be very different. Includes all in-lake and shoreline habitat and short connective stream segments. Water levels in these lakes and ponds are primarily influenced by annual snowmelt. These lakes provide spawning and rearing habitat for sockeye salmon and lake trout, and provide rearing habitat for coho salmon. Water temperatures in these systems are closely linked to changes in air temperature. Examples of clearwater connected lakes and associate streams include Hidden Lake/Creek, Fuller Lakes, Juneau Lake, Crescent Lake, Fox Creek, Chenik Creek, upper and lower Russian River lakes.

Potential index watershed

Russian River and lakes – This system receives a lot of recreational fishing pressure but otherwise is in a wilderness area so residential and road impacts are minimal. Reed canary grass is minimal with an opportunity to eradicate it. Recent stream temperature and discharge data exists and a new real-time temperature site has been established.

Conclusion

We identified the potential framework that the Kenai Peninsula Fish Habitat Partnership could use to track change within and across the Kenai Peninsula Borough. More discussion is needed to define the goals, metrics and timeline for an index watershed program and to establish long-term, interdisciplinary monitoring needs for understanding the relationships between salmon, habitat health, and changes induced by human activities and climate change. A Science and Data Committee could then develop and implement a study plan for each index watershed.

Literature Cited

Kenai Peninsula Cooperative Weed Management Area Working Group. 2011. A Strategic Approach to Managing Reed Canarygrass on the Kenai Peninsula. Appendix 1 of KP CWMA Strategic Plan (2007).

Mauger, S., Shaftel, R., Leppi, J.C. and D.J. Rinella. 2017. Summer temperature regimes in southcentral Alaska streams: watershed drivers of variation and potential implications for Pacific salmon. Canadian Journal of Fisheries and Aquatic Sciences. 74(5): 702-715, https://doi.org/10.1139/cjfas-2016-0076

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