

MEMORANDUM

State of Alaska

Department of Fish and Game
Division of Sport Fish

TO: Glenn Haight, Executive Director DATE: July 24, 2014
Board of Fisheries, Juneau
PHONE NO: (907) 465-6095

FROM: Thomas D Vania, Regional Supervisor SUBJECT: Description of the Soldotna Creek
Northern Pike Eradication Project
Division of Sport Fish, Region II

Synopsis: The northern pike is an invasive species on the Kenai Peninsula, and its establishment in the Soldotna Creek drainage has resulted in the loss of salmon and trout fisheries. Soldotna Creek is a tributary of the Kenai River and is a potential source of pike to other Kenai River tributaries. Although the Kenai River is not ideal northern pike habitat, northern pike entering the Kenai have the potential to colonize the Moose River tributary which is excellent pike habitat. Of greatest concern is the significant production of Kenai coho salmon that overwinter in the Moose River. Northern pike establishment in the Moose River could have devastating impacts on coho salmon populations. To prevent this, ADF&G plans to eradicate northern pike from the Soldotna Creek drainage using rotenone, a common fisheries management tool for the removal of invasive fish.

Goal: Eradicate the northern pike population from the Soldotna Creek drainage to prevent the spread of this invasive species, restore native fish populations to the drainage, and facilitate the Department's larger goal of eradicating northern pike from the Kenai Peninsula.

Public Processes and Permitting: In Alaska, there is an extensive public process for any northern pike eradication project involving rotenone. The details are presented below for the Soldotna Creek Pike Eradication Project.

Public Scoping. ADF&G conducted an extensive public scoping process to determine the level of community support for this project. Three public meetings were held in Kenai from March 22-24 and facilitated by USKH, a private consulting firm. ADF&G issued a press release in advance of the public scoping process (March 8, 2012). The meetings were advertised on KSRM, a Kenai Peninsula radio station, and flyers advertising the meetings were posted on message boards at local stores and businesses. In addition, letters describing the project along with invitations to the meeting were sent to 447 landowners in the Soldotna Creek area on approximately March 10, 2012. USKH also contacted 25 stakeholders identified by ADF&G as likely having a specific interest or concern about the project (by phone) to obtain their opinions about the proposed project. During each public meeting, a 1-hour seminar was given by ADF&G staff that described the proposed project. The public had an opportunity to ask questions of ADF&G staff and fill out an independent survey administered by USKH. Approximately 50 people attended the meetings, 8 people not in attendance submitted surveys to USKH, and one organization, KRSA, wrote a letter of support for the project. Overwhelmingly, the majority of comments expressed during the meetings, in writing, or over the phone were in support of the project. However, there were

participants from two households that were strongly opposed to the use of rotenone. One resident is an avid pike fisherman who prefers to have northern pike on the Kenai Peninsula. Members of the other household were fundamentally against the use of pesticides primarily for fear of human-health impacts or harm to non-target species. Additional questions were related to groundwater safety, safety to garden plants, fish kills outside of the treatment area, and impacts to recreation.

Given the strong public support, ADF&G proceeded with acquiring grant funds for the project. A grant to fund the first phase of the project was awarded in December 2012 (to begin in April 2013). An article announcing this funding and that permitting processes were forthcoming was published in the Kenai Peninsula Clarion on January 6, 2013.

APDES Permit. The Alaska Pollutant Discharge Elimination System permit (an EPA section 402 Clean Water Act permit administered by the State of Alaska Department of Environmental Conservation) was the first to be acquired by ADF&G. This permit involves preparing a detailed permit application and filing a “Notice of Intent (NOI)” with the ADEC. This process was completed September 16, 2013.

ADEC Pesticide Use Permit. The ADEC Pesticide Use Permit is an extensive permitting process that takes 6 months to 1 year to complete. It includes a detailed permit application that documents the project area, ensures the pesticide is registered for use in Alaska, identifies how much product will be applied, methods of delivery, timing of treatment, names of certified applicators and other details. The permit also includes a 30-day public comment period, and the applicant must supply an affidavit proving that public notice of the comment period has been published in a local newspaper on two consecutive days. Public notices ran in the Peninsula Clarion on April 20th and 21th, and the public comment period ran from April 22- May 22th. In advance of the public comment period, ADF&G staff went door to door to ~50 residences on Soldotna Creek drainage lakes and called the households that opposed the project to make sure that they were aware of the public comment period. There was one comment in opposition that was submitted to the ADEC, and it was from the same household that opposed the use of pesticides during the public scoping process. Weighing the ADF&G’s permit application packet and the public comment, ADEC issued the Pesticide Use Permit on May 23, 2014. There is a mandatory 40-day window in which the permitted agency may not proceed with their project following the issuance of the permit. This is to allow the public an opportunity to contest the ADEC’s decision. The 40-day window ended July 2nd, and this permitting process is now complete.

NEPA. The majority of funding for this project comes from a federal source. Therefore, this project must comply with the National Environmental Policy Act. This includes the development and subsequent federal review of an Environmental Assessment. ADF&G completed the Environmental Assessment in the spring of 2013, submitted it to the USFWS, and posted it on ADF&G’s website on April 20th for public review. The NEPA process also requires a 30-day public comment period. For simplicity, this comment period ran concurrently with the Pesticide Use Permit comment period from April 22nd – May 22nd. Two comments were received during this comment period. One was very supportive of the project. The other comment was in opposition and came from the same household that submitted opposing comments for the ADEC Pesticide Use Permit. Per NEPA procedures, ADF&G provided a written response to the USFWS addressing the opposing comment. The USFWS is currently completing their final review of the EA, public comments, and ADF&G’s response. Pending their analysis, they will issue a “Finding of No

Significant Impact (FONSI) document that will conclude the NEPA process. The FONSI has not yet been issued, but ADF&G has verbal confirmation that it is soon forthcoming.

In addition, there are several minor permits from within ADF&G, ADNR, and CIRI Corporation that are either complete or will be completed well in advance of the rotenone treatment.

Rotenone Treatment: ADFG's pike eradication plan in Soldotna Creek involves systematically treating the majority of the Soldotna Creek drainage with rotenone over a four-year period beginning with a treatment of Union Lake, East and West Mackey Lakes and Derks Lake from October 6-10, 2014. For planning and treatment purposes, the Soldotna Creek Drainage has been divided into two sections by a long-standing road/ beaver dam barrier at the outlet of Derks Lake that ADF&G has reinforced to be impassible for fish. The first section (Area 1 map) encompassing the aforementioned lakes contains no other fish species than northern pike. Following the rotenone treatments this fall, ADF&G will clear the lakes of dead pike to the extent possible and monitor the degradation of the rotenone under the ice during the winter. At ice-out in the spring of 2015, ADF&G will conduct an assessment to ensure all pike from Area 1 have been eradicated. The remainder of the drainage (Area 2 map) contains the mainstem of Soldotna Creek, Tree Lake, and Sevena Lake. These waters still contain native fish including Dolly Varden, rainbow/steelhead trout, lamprey, round whitefish, eulachon, coho salmon, pink salmon, sockeye salmon, Chinook salmon, sticklebacks, and slimy sculpin. Substantial efforts will take place in 2015 to relocate as many individuals of each species as possible to the Area 1 lakes that, at this point, will be devoid of fish. This will begin the process of restoring fish populations in the drainage. Area 2 will then be treated with rotenone in 2016 and 2017. Some native fish will be killed in this section. Information on native fish was gathered from a USFWS operated a video weir at the Kenai River/ Soldotna Creek confluence in 2009 and 2010. Their data demonstrated upstream passage of ~1,600 Dolly Varden, 510 coho salmon, 225 rainbow/steelhead, 142 eulachon, 95 pink salmon, and 58 sockeye salmon during the period the weir was operating. The timing of the upstream movements of all these species, however, occurred outside the window in which ADF&G plans to conduct the rotenone treatments. Rotenone will be applied to this open water section in late June because this is the period when water levels and flow rates will be the lowest and will require the least amount of rotenone. Though there will undoubtedly be some impacts to non-target fish species, ADF&G anticipates the impacts will be minimal. In addition, some of the impact will be mitigated by the native fish relocation effort in 2015.

As the rotenone is being applied to the mainstem of Soldotna Creek, it will be neutralized with Potassium Permanganate with two neutralization stations located approximately 30 minutes stream-travel distance above the confluence of Soldotna Creek and the Kenai River. Caged fish will be monitored very closely downstream of the neutralization stations to ensure that rotenone is not escaping into the Kenai River. If these sentinel fish show any signs of rotenone exposure, staff operating the neutralization stations will be immediately notified to increase the amount of Potassium Permanganate. However, even if a small amount of rotenone were to enter the Kenai, the water volume of the Kenai River will be sufficient to dilute any rotenone residues to such a degree that there would not be any harmful effects to Kenai River fish. Following the rotenone treatments to Area 2 in 2016 and 2017, Area 2 will be thoroughly assessed to ensure that all pike have been eradicated. The Derks Lake barrier will then be breached to allow fish passage throughout the drainage. The native fish held over in Area 1 and upstream migrations from the Kenai River will restore native fish populations throughout the drainage while the threat of northern pike establishing in the Moose River tributary will be eliminated.

Other AK Projects: Rotenone has been successfully used for northern pike eradication on six other occasions. In 2008, Cheney Lake in Anchorage and Arc Lake in Soldotna were treated. That winter, ADF&G used rotenone in a series of ponds in Yakutat with illegally-introduced northern pike. In 2009, ADF&G eradicated northern pike populations in Sand Lake in Anchorage and Scout Lake in Sterling. In 2012, ADF&G completed a large treatment of Stormy Lake in Nikiski to remove northern pike. This was the most complex project to date. Its purpose was to prevent northern pike establishment to the nearby Swanson River. This project included an open-water treatment of an outlet stream to the Swanson River and an effort to rescue and preserve native fish from Stormy Lake in net pens in a nearby lake for reintroduction to Stormy Lake after the rotenone degraded.

For all rotenone treatments, substantial pre-treatment field assessments are conducted to describe the water quality and biological inventory of each water body to be treated. Biological inventories include identifying all fish species and dominant invertebrate and plankton species present. Post-treatments, ADF&G has documented sufficient recolonization of invertebrates and plankton to support reintroduction of native fish.

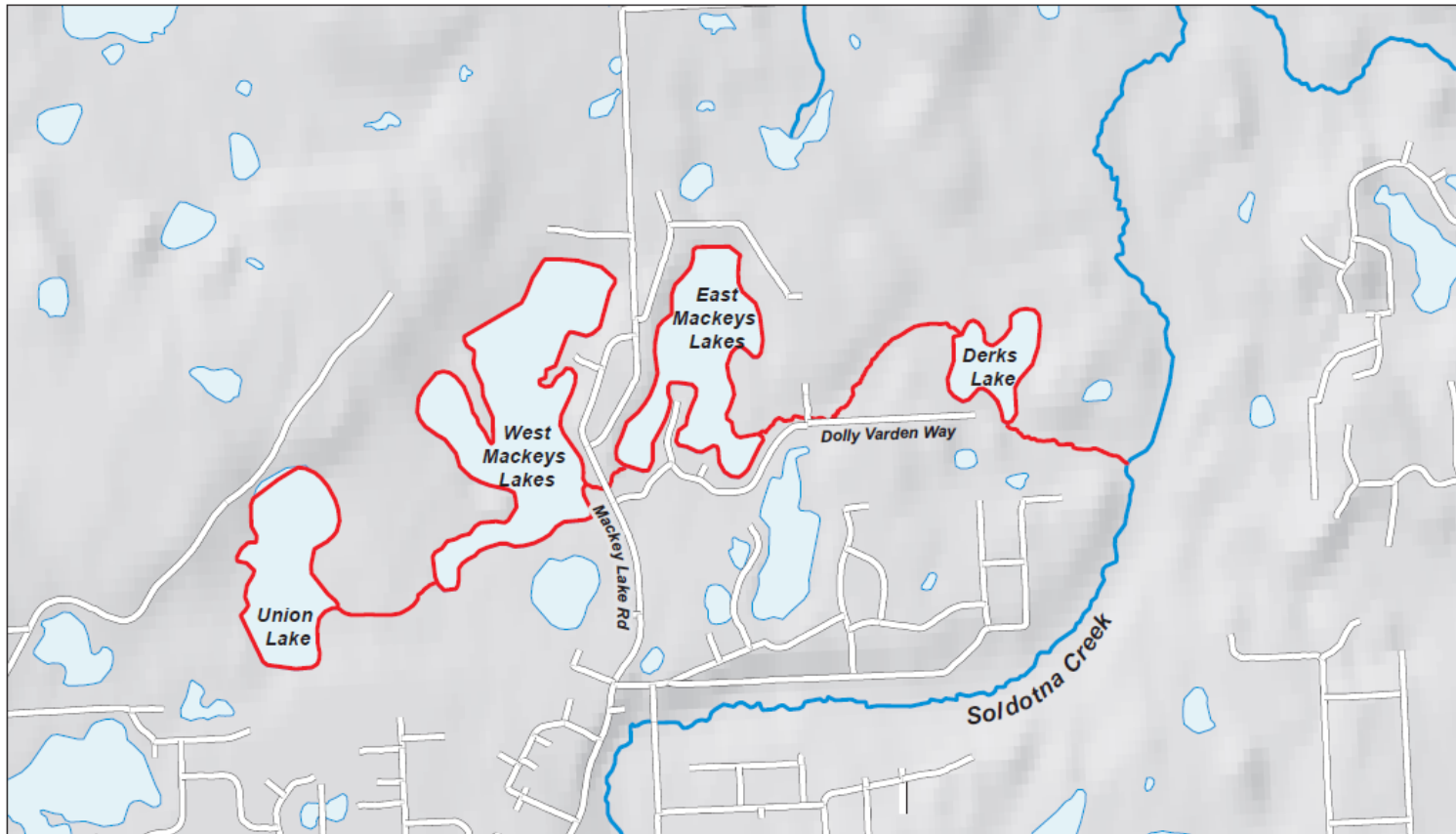
Funding: \$16,000 was awarded to ADF&G in 2012 by the National Fish Habitat Partnership (NFHP) to conduct the public scoping process for the Soldotna Creek project. NFHP also supplied an additional \$16,000 for the Kenai Watershed Forum to collect stream travel rate data in Soldotna Creek for planning the rotenone treatments and neutralization efforts. In December 2012, the Alaska Sustainable Salmon Fund (AKSSF) awarded ADF&G \$298,600 to complete the treatment of Area 1. ADF&G matched this grant with \$113,000 in staff salaries. In 2014, ADF&G submitted a grant to AKSSF to fund the Area 2 treatments. This grant request was \$447,100, and ADF&G plans to match this with \$159,000 in staff salaries. The grant request for Area 2 is currently under review, although ADF&G expects it to be funded. In not, this request will be resubmitted during the 2015 AKSSF call for proposals.

Rotenone Description: Rotenone is a naturally-occurring compound derived from the roots of tropical plants in the bean family. It has been used for centuries by indigenous cultures throughout the tropics to catch fish for food. Rotenone has been used as a piscicide by fish managers in the U.S. since the 1930s to remove unwanted or invasive fish. Currently, rotenone is commercially available as either a wettable-powder or as a liquid and is registered by the EPA as a restricted-use pesticide for fish management. Besides draining an entire water body, chemical treatment is currently the only fisheries management tool that is capable of completely eradicating an entire fish population. Rotenone is toxic to fish, although some species are more tolerant than others. Rotenone is a mitochondrial inhibitor. As such, it inhibits a biochemical process that makes it impossible for fish to use oxygen during cellular respiration. This occurs in fish and other gill-breathing organisms because it is readily absorbed through the gills into the blood stream. Non-gill breathing animals lack this rapid absorption route into the blood stream. At concentrations used for fisheries management (~1.0 ppm of rotenone product), rotenone that is ingested or spilled onto skin is broken down by enzymes and is, therefore, not harmful to birds or mammals. There has been debate in the last decade on whether rotenone can cause Parkinson's Disease. Prolonged, direct exposure reduces the level of dopamine in the brain, and in lab animals, this causes symptoms consistent with PD and other neurological conditions. However, the studies investigating this are completely unrelated to fisheries management. Neurologists studying diseases such as PD use rotenone in lab animals to mimic symptoms they are researching. In all such studies, laboratory animals are intravenously or intragastrically administered concentrated rotenone for prolonged

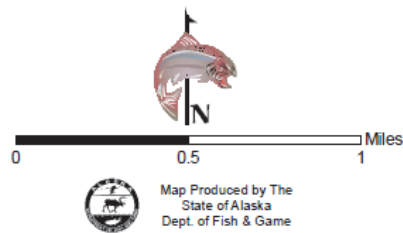
periods (i.e. weeks) to induce these effects. These studies are not relevant to fisheries management because the concentration of rotenone used (1 ppm) when diluted into a lake are not, in any way, comparable to the exposures in the medical studies. However, recognizing that debate on the subject exists and that information available online and in the literature is complex and inconsistent for the interested public to weed through, ADF&G has adopted a policy of advising the closure of any water body that is treated with rotenone with signs and public notices until water tests indicate the chemical is completely degraded. No exposure equates to no human health risk for the public, and ADF&G staff are well-trained and protected with appropriate protective gear when handling the rotenone during treatments.

For further questions, please contact Tom Vania, Region II Regional Supervisor, (907)267-2131 tom.vania@alaska.gov

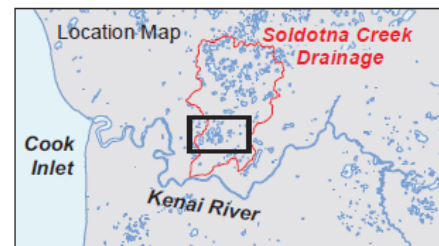
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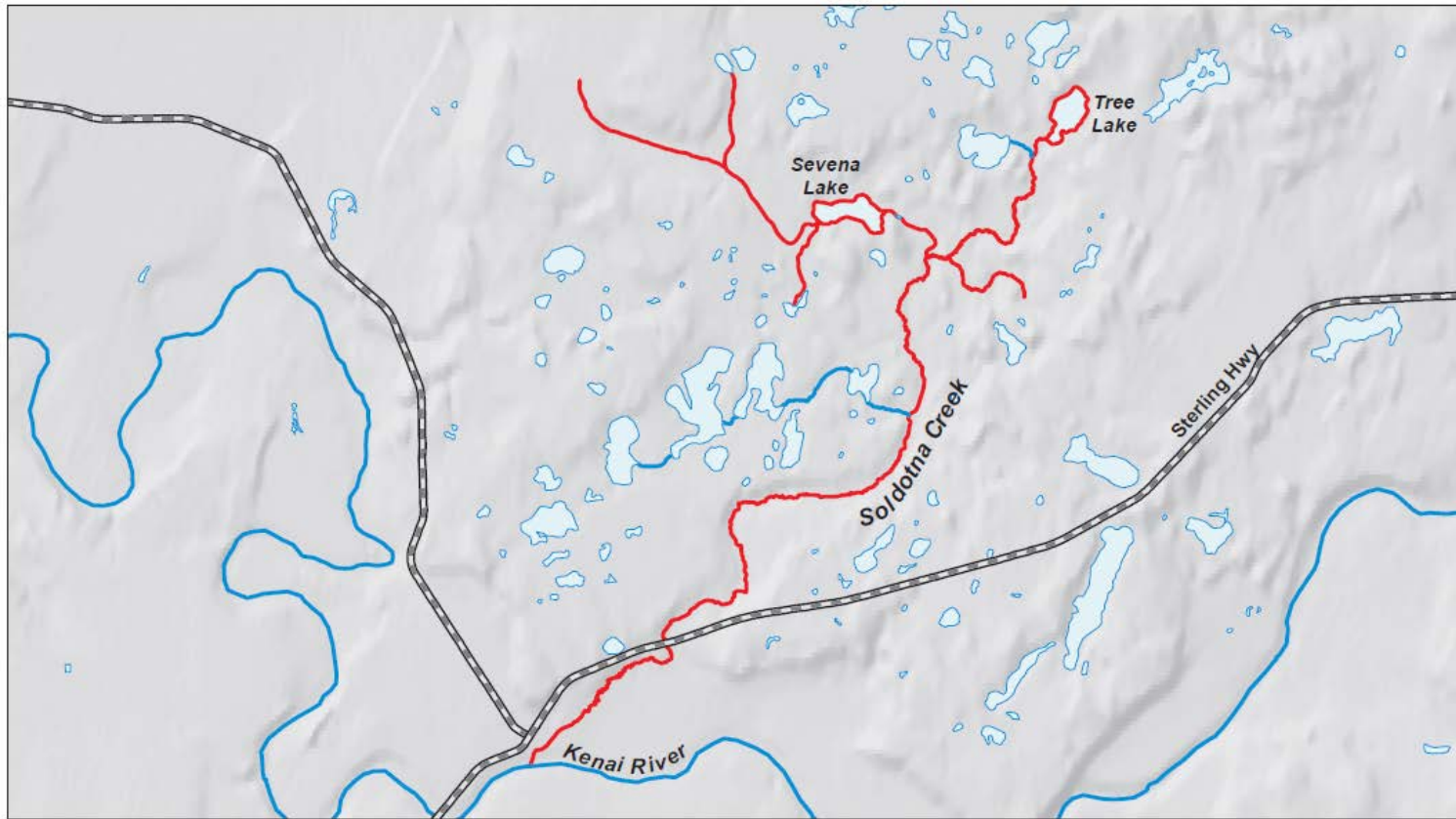
**Area One:
Western Branch of the
Soldotna Creek Drainage**



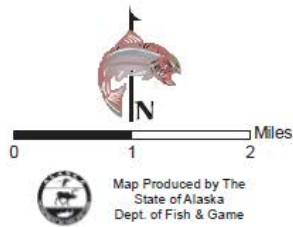
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Soldotna Creek Area 1



Area Two:
Mainstem Soldotna Creek and all
tributaries except Area One



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Soldotna Creek Area 2