# Appendix C/D

Alaska Department of Environmental Conservation

## Alaska Clean Water Actions

# Solicited Actions

### State Fiscal Years 2019-2021

### (March 2019 – February 2021)

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# Introduction

Appendix C/D contains the Waterbody Specific, Stewardship (Statewide or Regional), and Marine Beach actions for the 2019-2020 ACWA grant solicitation.

### Waterbody Specific Actions

Waterbody Specific actions are developed for projects on high priority waters that address identified water resource protection or restoration activities. For reference, the nearest community is in parentheses next to the waterbody names. Only project proposals addressing the actions on the high priority waters in this solicitation (listed in the table below) will be reviewed and scored.

### Stewardship Actions

The Stewardship (Statewide or Regional) actions address broad scale stewardship concerns. These align with the 5 year strategic planning process (see Nonpoint Source (NPS) Strategy and the 2015 Alaska Clean Waters Five-Year Plan (available under Related Resources at: ACWA Solicitation page). The NPS Strategy and Five-Year Plan identified turbidity, sediment, toxics (with an emphasis on metals and petroleum) and bacteria as pollutants of greatest concern. The actions place emphasis on addressing these pollutants. These actions may include work on high priority waters and/or larger regional areas.

### Marine Beach Actions

Appendix C/D also contains actions for DEC-identified marine beaches. To be considered for BEACH program funding, proposals MUST demonstrate local government support and involvement. Match for BEACH waterbody actions is not required.

### Project Timing

**This solicitation covers a two year period.** Projects may be implemented beginning on or near March 1, 2019 and must be completed by February 28, 2021. Projects may end prior to February 28, 2021, but cannot go beyond that date. Use the budget template to prepare separate estimates for each State fiscal year as needed:

- SFY 19 (March 1, 2019 – June 30, 2019)
- SFY 20 (July 1, 2019 – June 30, 2020)
- SFY 21 (July 1, 2020 – February 28, 2021).

All project proposals must use the Work Plan template to describe tasks and deliverables, and the Budget Spreadsheet Template for estimated expenses based on the requested action elements. Workplan and Budget templates can be found at:

https://dec.alaska.gov/water/water-actions/acwa-application

## Document Navigation

Use the links below to navigate directly to a Waterbody Specific, Stewardship or Beach action. Alternatively, you may scroll through the pages to the action of interest or follow the links from the table of contents. Note that the solicited action(s) may continue onto additional pages.



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# Waterbody Specific Actions

## 1. Anchorage Bowl Waterbodies (Anchorage)

**DEC Contact**: Jeanne Swartz, jeanne.swartz@alaska.gov or (907) 269-7523

### Water Quality Goal

**Reduce bacteria pollution.** Reduce pollutant loading on impaired waters in the Anchorage Bowl watersbodies in order to meet Total Maximum Daily Load requirements and achieve Water Quality Standards.

### Solicited Action to Help Reach Goal

#### ACTION 1: Evaluate Total Maximum Daily Load progress for bacteria

Evaluate progress on implementing Total Maximum Daily Load (TMDL) pollution budget plans for bacteria in Anchorage Bowl waterbodies. This project would be a continuation of a similar project undertaken in SFY 18-19 on Little Campbell Creek and Chester Creek, including Westchester Lagoon and University Lake. More information on the SFY18-19 project is available from the contact above.

Tasks A and B include the following waterbodies: Ship Creek, Fish Creek, Campbell Creek, Little Rabbit Creek, Little Survival Creek, and Furrow Creek. These tasks essentially duplicate the SFY 18-19 work on the Chester Creek watershed and Little Campbell Creek. Task C requests further analysis on all of the waters.

The proposal for this Action should include the following tasks and deliverables:

A. Compile all available bacteria data, including DEC data, volunteer-collected data, and data collected as part of the Anchorage municipal separate storm sewer (MS4) permit outfall monitoring requirement for the following Anchorage waterbodies: Ship Creek, Fish Creek, Campbell Creek, Little Rabbit Creek, Little Survival Creek, and Furrow Creek. There is bacteria data for Ship Creek, from a 2011 DEC-funded monitoring study, available at the federal Water Quality Portal (WQP): Water Quality Portal). Analyze all available data using the Pathogens listing methodology and water quality data assessment tools. The listing methodology is available on this page under Final Listing Methodologies: DEC Integrated Report page.
B. Use GIS mapping and other tools, if available, to predict where additional BMPs or further bacteria monitoring may be necessary.
C. After data analysis and GIS mapping analysis are complete, evaluate the bacteria TMDLs to determine if the plans should be revised. The data compilation for Little Campbell Creek and the Chester Creek watershed is available from the federal WQP: Water Quality Portal. Re-do calculations for all applicable TMDLs, if comparison between TMDL data and available monitoring data, post-2010, shows statistically significant differences. Prepare a report with data-supported conclusions about whether TMDLs should be modified. Include suggested considerations for implementing BMPs in Anchorage.

## Project Schedule

Projects may be implemented beginning on or near March 1, 2019 and must be completed by February 28, 2021. Suggested schedule:

- March 1, 2019 – June 30, 2019 (SFY 19)
  - Complete compilation and analysis of all bacteria data.
- July 2019 – June 30, 2020 (SFY 20)
  - Use GIS mapping and other tools, if available, to predict where additional BMPs or further bacteria monitoring may be necessary for the six Anchorage waterbodies.
  - Review TMDLs comparing the data used in the TMDL to the post-TMDL monitoring data results, post-2010.
- July 2020 – February 28, 2021 (SFY 21)
  - Evaluate the TMDLs and prepare report.

## Water Quality Concern and Background Information: Urbanization

Bacteria TMDLs for the Anchorage waterbodies are available here: DEC Impaired Waters page

All of the waterbodies are all in the Waterbody Recovery Track with bacteria pollution being a primary concern. The DEC listed these waterbodies on the Clean Water Act Section 303(d) list as impaired for fecal coliform. From 2000-2008, DEC completed TMDL plans. The TMDLs specified that waterbody recovery could be addressed by implementing BMPs, including measures to limit dog waste, and also to perform post-TMDL monitoring.

The Municipality of Anchorage (MOA) and Alaska Department of Transportation (ADOT), as co-permittees, were first subject to municipal separate storm sewer system (MS4) permit requirements in 1995 and renewals have continued to the present. DEC issues MS4 permits help communities meet the standard of "reducing pollutants to the Maximum Extent Practicable, and include measures to:

- Identify major outfalls and pollutant loadings
- Detect and eliminate non-storm water discharges to the system
- Reduce pollutants in runoff from industrial, commercial, and residential areas
- Control storm water discharges from new development and redevelopment areas.

This project will help determine if the loading identified in the TMDLs, and subsequently incorporated into the Anchorage MS4 permit, needs to be adjusted.

# 2. Campbell Creek (Anchorage)

**DEC Contact**: Jeanne Swartz; jeanne.swartz@alaska.gov; 907-269-7523

## Water Quality Goal

**Reduce urban runoff pollution.** Support local efforts to address impairment and institute protection measures for Campbell Creek.

## Solicited Actions to Help Reach Goal

**There are two Actions open for proposals for Campbell Creek. Grantees may submit proposals to address one or both Actions listed below.**

### ACTION 1: Construct green infrastructure along the Campbell Creek Greenbelt

As part of a collaboration with the Department of Natural Resources – Division of Forestry (DNR-FOR), DEC will fund a grantee to construct three green infrastructure projects along the Campbell Creek Greenbelt. Guidance 2 includes additional green infrastructure practices information.

Project proposals may include a combination of planning, design, construction, and outreach components, but must include construction of at least three green infrastructure projects during the grant cycle.

The proposal for this Action should include the following tasks and deliverables:

A. **Planning**: Identify three areas along the Campbell Creek greenbelt downstream of Piper Street that would receive the highest benefit from green infrastructure projects. This includes those areas most at risk from current and past development patterns and those of highest environmental value (e.g., salmon habitat).
B. **Design and construction of green infrastructure projects**:
    1. *Design:* Complete designs of three green infrastructure projects suitable for the sites selected along the Campbell Creek greenbelt. Projects may range from small and discrete (e. g., planters used to capture roof runoff) to larger (e.g., bioswales or rain gardens). Design should include a calculation of the environmental benefit (e.g., reduced stormwater run-off).
    2. *Construction:* Construct three green infrastructure projects, according to the designs completed for the sites selected along the Campbell Creek greenbelt.
    3. *Maintain:* All constructed projects must have a maintenance agreement as a deliverable.

## Project Schedule

Projects may be implemented beginning on or near March 1, 2019 and **must be completed by April 30, 2020**. The schedule is based on the DNR-FOR grant period. This is shorter than other Actions in the ACWA 2019-2020 grant cycle. Suggested schedule:

- March 1, 2019 – June 30, 2019 (SFY 19)
    - Identify sites suitable for green infrastructure construction.

  - Select three sites as being most suitable in terms of construction cost compared to environmental benefit.
  - Complete design of three green infrastructure projects.
- July – September, 2019 (SFY 20)
  - Begin construction of one or more green infrastructure projects.
- October, 2019 – December, 2019 (SFY 20)
  - Complete construction of green infrastructure projects along the Campbell Creek greenbelt, as weather permits.
- January – April, 2020 (SFY 20)
  - Prepare final report, including record of site selection, design of green infrastructure projects, video record of construction, analysis of cost/ environmental benefit, maintenance agreements with landowners, and any recommendations for future projects

### ACTION 2: Perform ambient water quality monitoring for common stormwater pollutants

Perform ambient water quality monitoring to determine concentrations of pollutants, particularly the common pollutants found in contaminated stormwater runoff. The extent of monitoring will cover approximately five miles of Campbell Creek, from above the confluence with Little Campbell Creek downstream to Campbell Lake at times of low flow (April-May) and times of high flow (July-August).

The proposal for this Action should include the following tasks and deliverables:

A. **Planning:** Develop a Sample Plan and Quality Assurance Project Plan (QAPP) which must be approved by DEC. DEC has recent examples that may be used with appropriate editing. The sampling plan will be designed so the data objectives and assessment results meet the requirements as applicable in DEC's *Consolidated Assessment and Listing Methodology,* DEC's updated *Listing Methodology for Determining Water Quality Impairments from Pathogens*, and the *Listing Methodology for Determining Water Quality Impairments from Petroleum Hydrocarbons, Oils and Grease*. Listing methodologies are available on this page under Final Listing Methodologies: DEC Integrated Report page.

B. **Monitoring**:
   1. Sampling locations should include the 5 river mile impaired stretch of Campbell Creek, as well as background samples to be collected upstream, in the Far Bicentennial North Park.
   2. Stormwater pollutants, should be measured:
      a) Collect and analyze water samples for pollutants of concern. Field and analytical parameters will also include input data needed for the biotic ligand model. The following parameters are required:
         1. Laboratory parameters:
            a. Fecal coliform (SM9222-D by membrane filtration)
            b. E. Coli (SM 9223B)
            c. Dissolved organic carbon (SM 5310B)

d. Settleable Solids (EPA 160.5)
e. Total solids (SM 2540G)
f. Ammonia-N (EPA 350.1)
g. Total nitrate and nitrite-N (EPA 353.2)
h. Hardness (EPA 200.7)
i. Major cations – Ca, Mg, Na (EPA 200.7), total and dissolved K (SM 4500)
j. Major anions – SO4, Cl (EPA 375, 325)
k. Alkalinity (SM 2320B)
l. Sulfide (EPA 376)
m. PAHs (EPA Method 625)
n. Dissolved metals (EPA 200.8)

2. In-situ field measurements:
   a. Discharge flow
   b. Turbidity
   c. Specific conductance
   d. Temperature
   e. Dissolved oxygen
   f. pH
3. Sediment sample analyses:
   a. Total metals (EPA 6010D)
   b. PAHs (EPA 8270-SIM)

3. Sample collection will be designed to address the magnitude, frequency and duration of pollutants of concern during various flow conditions.

C. **Reporting**: The grantee will analyze all samples, evaluate results and prepare a draft and final report of findings and conclusions.
   1. Following each sampling event, a brief sampling event summary, a copy of the completed chain of custody forms and field data sheets, site photos, and the laboratory analytical results will be submitted.
   2. Samples will be analyzed, results evaluated, and a draft and final report of findings and conclusions prepared.

D. **Data submission:** The grantee is responsible for ensuring data collected is provided in a format that can be easily transferred to DEC's water quality database (AWQMS). DEC will provide the grantee with the needed data template for AWQMS and guidance on how to use the template. The grantee should budget time to become proficient in the use of the reporting data template.

E. A second year of sampling may be necessary, depending on the results of sampling during the first field season, May-August, 2019.

## Project Schedule

Projects may be implemented beginning on or near March 1, 2019 and must be completed by February 28, 2021. Suggested schedule:

- March 1, 2019 – June 30, 2019 (SFY 19)
  - Prepare a Quality Assurance Project Plan (QAPP) and Sampling Plan; receive DEC approval of QAPP.
  - Select monitoring sites along Campbell Creek.
  - May – June, 2019 – conduct sampling
- July – September, 2019 (SFY 20)
  - Conduct monitoring.
- October, 2019 – February, 2020 (SFY 20)
  - Analyze results of 2019 monitoring, prepare draft report for DEC review; conduct data entry.
  - Consult with the Anchorage co-permittees (Municipality of Anchorage and AK Department of Transportation and Public Facilities) about conditions of reissuance of their Municipal Separate Storm Sewer System (MS4) permit. The co-permittee application is due on February 2, 2020 and the MS4 permit expires July 31, 2020.
- March – June 30, 2020 (SFY 20)
  - Compare 2019 monitoring results with compliance test results from the Municipality of Anchorage's (MOA) Municipal Separate Storm Sewer System (MS4) most recent permit outfall monitoring results, consult with the Department of Fish and Game (DF&G) regarding monitoring results and the potential effect on silver (coho) salmon. Prepare for possible second season of monitoring, including updating QAPP for second season.
  - Present results at MOA Watershed Section's annual APDES meeting in March.
  - Conduct monitoring (May or June), if necessary.
- July, 2020 – September, 2020 (SFY 21)
  - Conduct monitoring, if necessary.
- October, 2020 – February, 2021 (SFY 21)
  - Analyze results, prepare draft report for DEC review, complete data entry.
- March – June 30, 2021 (SFY 21)
  - Compare 2020 monitoring results to the MOA's most recent MS4 permit outfall monitoring results, consult with DF&G's reports on silver salmon mortality.
  - Present results at MOA Watershed Section's annual APDES meeting in March.
- July 1, 2021 – February 28, 2021 (SFY 22)
  - Prepare draft and final report that includes recommendations for any potential Anchorage MS4 permit modifications.

## Water Quality Concern and Background Information

Campbell Creek is in the Waterbody Recovery Track with bacteria pollution being a primary concern. The Department of Environmental Conservation (DEC) listed Campbell Creek on the Clean Water Act Section 303(d) list as impaired for fecal coliform bacteria. In 2006 the DEC completed a Campbell Creek Total Maximum Daily Load (TMDL), or water quality recovery plan.

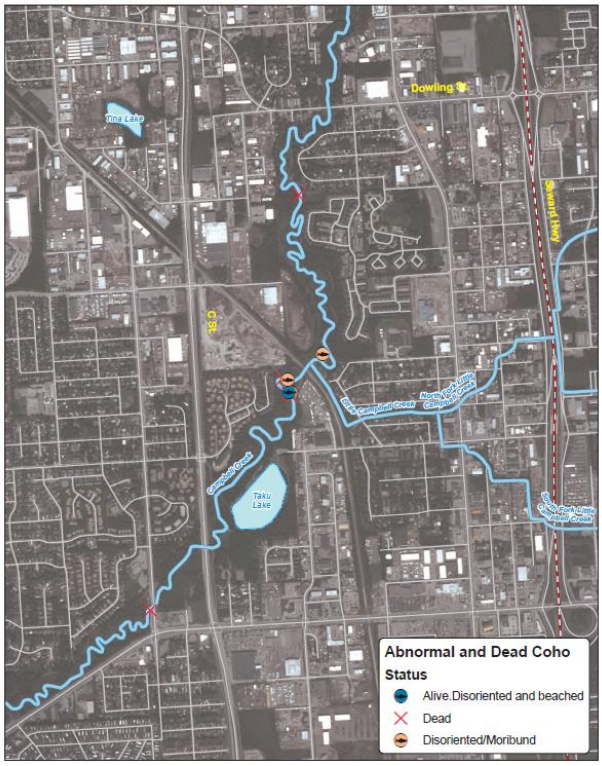



**Figure 1. Section of Campbell Creek where adult silver (coho) salmon fish kills**

In addition to bacteria, there are concerns about other toxic pollutants in stormwater runoff. Using green infrastructure (instead of grey) is one mechanism to improve water quality.

DEC is partnering in the U.S. Forest Service "Fish Need a Forest: Restoring Campbell Creek" grant; the grant recipient is DNR-FOR. The goal for the grant outcome is to improve stream and forest health along the Campbell Creek greenbelt. As part of the grant, DEC committed to constructing three green infrastructure projects. Other partners include: DF&G, MOA, and the Anchorage Parks Foundation (APF).

In 2017 and 2018, the DF&G documented several occurrences of fish kills in the Campbell Creek greenbelt, near Taku Lake (see Figure 1). The fish kills documented are similar to occurrences of fish kills in Washington State. (Feist, B. E., et al., Roads to ruin: conservation threats to a sentinel species across an urban gradient. *Ecological Applications*, 0(0), 2017, 1–15.

The species of fish (adult silver or coho salmon) and the apparent manner of death were also similar to the reports of fish kills from Washington State.

In addition to the fish kills, the MOA has documented exceedances of copper in stormwater sampling near the fish kills sites. Monitoring for certain pollutants at designated outfalls is required by the MOA's MS4 permit. For more information, see:
Anchorage Stormwater Outfall Report

# 3. Chena River Watershed (Fairbanks)

**DEC Contact**: Chandra McGee; chandra.mcgee@alaska.gov; 907-451-2140

## Water Quality Goal

**Reduce urban runoff pollution.** Support local efforts to address impairment and institute protection measures for the Chena River, Chena Slough and Noyes Slough.

## Solicited Action to Help Reach Goal

### ACTION 1: Design and construct green infrastructure in the Chena River watershed

Work with local community groups and local government to implement green infrastructure projects in the Chena River Watershed (Chena River, Chena Slough and Noyes Slough). Project proposals may include a combination of planning, design, construction, and outreach components, but must include construction of at least two green infrastructure projects each year (summer 2019 and summer 2020). See Guidance 2 for additional Green Infrastructure information.

The proposal for this Action should include the following tasks and deliverables:

A. **Planning**: Use previously developed planning documents to select areas within the community that would receive the highest benefit from green infrastructure projects. This includes those areas most at risk from current and past development patterns and those of highest environmental value (e.g., salmon streams). Planning documents include:
   1. Chena River Watershed Resource Action Plan executive summary (WRAP Executive Summary)
   2. Chena Watershed High Priority Areas Map (coming soon) (WRAP MAP)
   3. City of Fairbanks Green Infrastructure Opportunities Maps (see appendix of Green Infrastructure Solutions 2011 report) (GI Solutions Report).

B. **Design and construct green infrastructure projects:**
   1. *Design*: Complete a design of a green infrastructure project. Projects may include re-design of existing gray infrastructure. Design should include a calculation of the environmental benefit (e.g., reduced stormwater run-off and sediment reduction).
   2. *Construction*: Construct one or both of the following:
      a) Demonstration project that includes an educational component: The project will allow for a permanent opportunity for local citizens, including elected officials, to see first-hand the value of implementing green infrastructure. The project should be designed to encourage local officials to require green infrastructure (i.e. through adoption in local land use codes).
      b) Large-scale green infrastructure project (larger than demonstration): Applications should include an estimate of the amount of stormwater retained on-site and (if data is available) an estimate of pollutant load reductions.
   3. *Maintain:* All constructed projects must have a maintenance agreement as a deliverable.

## Project Schedule

Projects may be implemented beginning on or near March 1, 2019 and must be completed by February 28, 2021.

## Water Quality Concern and Background Information

The Chena River, Chena Slough, and Noyes Slough are in the Waterbody Recovery track with urban runoff pollution being the primary concern. Historically, all three waterbodies were listed as impaired (polluted) from petroleum hydrocarbons, oil and grease and for sediment in the early 1990s. Noyes Slough was also listed as polluted from residues (debris or trash). Recent data shows that the waterbodies are now meeting the sediment criteria.

These waters provide important habitat to Chinook salmon, chum salmon, and arctic grayling. Multi-agency and community wide clean-up efforts, restoration planning and increased implementation of green infrastructure have improved water quality significantly.

Green Infrastructure is a cost-effective approach to managing urban stormwater run-off. Green infrastructure mimics natural processes to reduce run-off and treat stormwater at its source, while also delivering environmental, social and economic benefits. Some environmental benefits include:

- reduces polluted run-off to rivers and streams
- increases rainwater and snowmelt infiltration into the ground
- reduces pressure on the city's storm-water system
- prevents erosion.

# 4. Deshka River (tributary to Susitna River)

**DEC Contact**: Laura Eldred, laura.eldred@alaska.gov or (907) 376-1855

## Water Quality Goal

**Assess petroleum pollution**: Determine if the Deshka River meets total aromatic hydrocarbon (TAH) water quality criteria (WQC) using 96-hour average TAH concentrations.

## Solicited Action to Help Reach Goal

### ACTION 1: Conduct ambient water quality monitoring on the Deshka River for petroleum hydrocarbons

Based on the 2014 screening level sampling results, more extensive water quality sampling was initiated in August 2018 and planned for June 2019. The DEC petroleum hydrocarbon listing methodology requires at least two years of data to make water quality decisions. This project request will collect a second and possibly third year of data to allow DEC to make a water quality health determination.

The proposal for this Action should include the following tasks and deliverables:

A. **Planning**: A Sampling Plan and Quality Assurance Project Plan (QAPP) must be prepared for approval by DEC. Contact DEC for recent examples that may be used with appropriate editing. The Sampling Plan must be designed so that results meet the requirements in DEC's *Listing Methodology for Determining Water Quality Impairments from Petroleum Hydrocarbons, Oil & Grease*. Listing methodologies are available on this page under Final Listing Methodologies: DEC Integrated Report page. Methodology requirements include:
   1. A minimum of 20 samples at each sampling location and the sample results averaged over the entire 4-day period.
   2. Analysis of samples must use EPA method 624 for Total Aromatic Hydrocarbons.

B. **Monitoring**:
   1. All monitoring locations will be located in the lower 1 mile of the Deshka River and must be the same 3 monitoring locations previously sampled in 2018 (contact DEC for more details).
   2. The sampling schedule will be temporally spaced to be representative of motorized boat use patterns and at minimum include:
      a) One 4-day (96 hour) sampling event in the month of August during the silver salmon fishery in 2019;
      b) One 4-day (96 hour) sampling event in June to early July during the king salmon fishery in 2020; and
      c) At least part of the 96 hour sampling event period must coincide with anticipated heavy boat traffic based on historic fish run timing. Use: ADF&G Fish Counts.
   3. Additional sampling event requirements:
      a) Discharge
      b) Visual examination for sheen
      c) Water depth
      d) Stream width
      e) Number of motorized boats, motor type, and horsepower (in order to determine TAH loading for volume of water). Stop-action photography is allowable to assist in boat count information.

C. **Reporting**:
   1. Within 72 hours following each sampling event, the grantee will submit a brief sampling event summary report including:
      a) Copy of the completed chain of custody forms
      b) Copy of the field data sheets.
   2. The grantee will submit laboratory reports with sample analysis results as soon as available.
   3. The grantee will analyze all samples, evaluate results and prepare a draft and final report of findings and conclusions.

D. **Data submission**: The grantee is responsible for either directly entering their project data into the Environmental Protection Agency's (EPA) water quality database (STORET) or ensuring data collected is provided in a format that can be easily transferred to DEC's water quality database (AWQMS). DEC will provide the grantee with the needed data template for AWQMS and guidance on how to use the template. The grantee should budget time to become proficient in the use of the reporting data template.

## Project Schedule

Projects may be implemented beginning on or near March 1, 2019 and must be completed by February 28, 2021. Suggested schedule:

- March 1, 2019 – June 30, 2019 (SFY 19)
  - Spring 2019 – develop QAPP; receive DEC approval of QAPP.
  - Early summer 2019 – prepare for sampling.
- July 1, 2019 – June 30, 2020 (SFY 20)
  - August 2019 – conduct sampling.
  - Winter 2019 – analyze results, compare to previous results, prepare draft report for DEC review; conduct data entry.
  - Spring 2020 – prepare for sampling.
  - June 2020 – conduct sampling.
- July 1, 2020 – February 28, 2021 (SFY 21)
  - August 2020 – conduct second year of sampling *(Only needed if August 2019 results exceed WQC. For budgeting purposes include it in your proposal knowing that it may be removed at a later date).*
  - Fall 2020 – analyze results, compare to previous results, add data to draft report for DEC review; conduct data entry.
  - Winter 2020/2021 - Finalize project report and data for submittal to DEC.

## Water Quality Concern and Background Information: Petroleum Hydrocarbons

Deshka River is in the Protect and Maintain Track with water quality and aquatic habitat being primary concerns. The Deshka River typically receives intensive motorized boat use (especially the lower 3 miles) during summer fisheries. The river also serves as a transportation corridor for boats traveling to cabins. Impacts from these activities to water quality and aquatic habitat are of concern for maintaining a healthy aquatic ecosystem.

In 2014 DEC conducted screening level TAH water quality sampling. Results documented seasonal

and localized TAH water quality standard exceedances from motorized watercraft as found in the project report 2014 Deshka Final Report.

Compounds in gasoline are highly toxic and tend to accumulate in the fats and oils of organisms. These gasoline compounds can impact or kill aquatic organisms such as insects that serve as a food source for fish and wildlife. The negative effects of gasoline can move up the food chain from the aquatic insects to fish to wildlife and potentially to humans. Polluted water can also affect fish and wildlife through direct contact and consumption of polluted river water. Because gasoline contains known cancer-causing compounds (carcinogens) such as Benzene and Benzo(a)pyrene, controlling their concentration in the Deshka River is important not only to protecting the environment but ultimately human health.

# 5. Jordan Creek Watershed (Juneau)

**DEC Contact**: Gretchen Pikul; gretchen.pikul@alaska.gov; 907-465-5023

## Water Quality Goal

**Reduce urban runoff pollution.** Support efforts to address impairment and institute protection measures for Jordan Creek.

## Solicited Action to Help Reach Goal

**There are three Actions open for proposals for Jordan Creek. Grantees may submit proposals to address one or more of the Actions listed below.**

### ACTION 1: Conduct ambient water quality monitoring for common stormwater pollutants

Perform ambient water quality monitoring to determine concentrations of pollutants, particularly the common pollutants found in contaminated stormwater runoff and the criteria of concern (sediment and interstitial dissolved oxygen) documented in the 2009 TMDL (DEC TMDL page). Proposals must include two years of water quality data collection in 2019 and 2020.

The proposal for this Action should include the following tasks and deliverables:

A. **Planning:** Develop a Sample Plan and Quality Assurance Project Plan (QAPP) which must be approved by DEC. DEC has recent examples that may be used with appropriate editing. The sampling plan will be designed so the data objectives and assessment results meet the requirements in DEC's updated *Listing Methodology for Determining Water Quality Impairments from Pathogens*, DEC's *Listing Methodology for Determining Water Quality Impairments from Turbidity*, and the *Listing Methodology for Determining Water Quality Impairments from Petroleum Hydrocarbons, Oils and Grease*. Listing methodologies are available on this page under Final Listing Methodologies: DEC Integrated Report page

B. **Monitoring**: Conduct ambient water quality monitoring for pollutants of concern in surface water and sediment throughout the watershed for various water conditions (spring flow, summer base flow and fall storm flow).
   1. Collect and analyze water samples for pollutants of concern. Field and analytical parameters will also include input data needed for the biotic ligand model. The following parameters are required:
      a) Fecal coliform (SM9222-D by membrane filtration)
      b) E. Coli (SM 9223B)
      c) Dissolved organic carbon (SM 5310B)
      d) Settleable Solids (EPA 160.5)
      e) Total solids (SM 2540G)
      f) Ammonia-N (EPA 350.1)
      g) Total nitrate and nitrite-N (EPA 353.2)
      h) Hardness (EPA 200.7)
      i) Major cations – Ca, Mg, Na (EPA 200.7), total and dissolved K (SM 4500)
      j) Major anions – SO4, Cl (EPA 375, 325)
      k) Alkalinity (SM 2320B)
      l) Sulfide ((EPA 376)

m) PAHs (EPA Method 625)
n) Dissolved metals (EPA 200.8)

2. Additional in situ field measurements will be conducted to measure basic water quality parameters:
   a) Discharge flow
   b) Turbidity
   c) Specific conductance
   d) Temperature
   e) Dissolved oxygen
   f) pH
3. Sediment samples will be collected and analyzed for:
   a) Total metals (EPA 6010D)
   b) PAHs (EPA 8270-SIM)
4. Sample collection will be designed to address the magnitude, frequency and duration of pollutants of concern during various flow conditions.

C. **Reporting**: The grantee will analyze all samples, evaluate results and prepare a draft and final report of findings and conclusions.
   1. Following each sampling event, a brief sampling event summary, a copy of the completed chain of custody forms and field data sheets, site photos, and the laboratory analytical results will be submitted.
   2. Samples will be analyzed, results evaluated, and a draft and final report of findings and conclusions prepared.

D. **Data submission:** The grantee is responsible for ensuring data collected is provided in a format that can be easily transferred to DEC's water quality database (AWQMS). DEC will provide the grantee with the needed data template for AWQMS and guidance on how to use the template. The grantee should budget time to become proficient in the use of the reporting data template.

## Project Schedule

Schedule will be dependent on proposal components. Projects may be implemented beginning on or near March 1, 2019 and must be completed by February 28, 2021.

### ACTION 2: Design, construct and maintain green infrastructure in the Jordan Creek watershed

Work with local community groups and local government to implement two green infrastructure projects in the Jordan Creek Watershed. Proposals may include a combination of planning, design, construction, and outreach components, but must include construction of at least one green infrastructure project each year (summer 2019 and summer 2020). See Guidance 2 for additional Green Infrastructure information.

The proposal for this Action should include the following tasks and deliverables:

A. **Planning**: Use previously developed planning documents to identify areas within the community that would receive the highest benefit from green infrastructure projects. This includes those areas most at risk from current and past development patterns and those of highest environmental value. Planning documents include:
   1. 2018 Jordan Creek Management Plan (available by request from contact above)

2. 2018 Lower Jordan Creek Riparian Assessment (available by request from contact above)
3. 2009 TMDL to Address Sediment and Interstitial Dissolved Oxygen Impairments in Jordan Creek (DEC TMDL page)
4. 2005 TMDL for Residue in Waters of Jordan Creek (DEC TMDL page)
5. Historical reports (DEC Juneau Watersheds page)

B. **Design**: Complete designs for two green infrastructure projects. Designs must include a calculation of the environmental benefit (e.g., reduced stormwater run-off).

C. **Construction**:
   1. Construct two green infrastructure projects. Projects should include an estimate of the amount of stormwater retained on-site and (if data is available) an estimate of pollutant load reductions.
   2. Include an educational component. The projects will allow for a permanent opportunity for local citizens, including elected officials, to see first-hand the value of implementing green infrastructure. The projects should be designed to encourage local officials to require green infrastructure (i.e., through adoption in local land use codes).

D. **Maintain**: The constructed projects must have a maintenance agreement as a deliverable.

## Project Schedule

Schedule will be dependent on proposal components. Projects may be implemented beginning on or near March 1, 2019 and must be completed by February 28, 2021.

### ACTION 3: Develop a watershed plan

**Enhance** the recently completed 2018 Jordan Creek Management Plan to include all of the Environmental Protection Agency's (EPA) 9 elements for watershed planning.

The proposal for this Action should include the following tasks and deliverables:

A. **Planning**: As much as practicable, the plan will include the EPA's 9-element watershed planning process (see Guidance 1 at the end of this document) within the 2018 Jordan Creek Management Plan. The management plan will consider a watershed approach and also innovative approaches such as green infrastructure and other similar measures as they may provide more sustainable solutions.

   The management plan should document and evaluate stormwater management options for reducing the pollutants (especially sediment) entering Jordan Creek from stormwater discharges (i.e., structural, non-structural, retrofitting, etc.). The Plan should include, but not be limited to:

   - Discussion of options
   - Work needed to implement each option (e.g., field assessments, new ordinances, etc.)
   - List of partners

- Timeline
- Rough cost estimates and potential funding sources
- Responsible entities for implementation
- Long-term maintenance needs
- Projected pollutant reductions
- Benefits to the receiving water
- Other environmental and public health benefits associated with each option, including aesthetic appeal and community support

## Project Schedule

Schedule will be dependent on proposal components. Projects may be implemented beginning on or near March 1, 2019 and must be completed by February 28, 2021.


Abbreviated list of EPA's 9 elements for watershed planning. See additional guidance at the end of this document.

## Water Quality Concern and Background Information

Jordan Creek is in the Waterbody Recovery Track with urban runoff pollution being the primary concern. The waterbody impairments are listed as sediment and dissolved oxygen with expected pollutant sources of land development and road runoff, as well as snow dumps and winter road maintenance. The dissolved oxygen (DO) listing is associated with low interstitial DO concentrations found in the streambed, not within the water column. Jordan Creek is also listed as polluted from residues (debris or trash).

Jordan Creek provides important spawning and rearing habitat for supporting anadromous fish populations and has historically supported populations of wild coho, chum and pink salmon, Dolly Varden and cutthroat trout. Multi-agency and community wide annual clean-up efforts, restoration planning and limited implementation of green infrastructure have occurred, however, restoration and water quality improvements are still needed to meet water quality criteria.

Green Infrastructure is a cost-effective approach to managing urban stormwater run-off. Green infrastructure mimics natural processes to reduce run-off and treat stormwater at its source, while also delivering environmental, social and economic benefits. Some environmental benefits include:

- reduces polluted run-off to rivers and streams
- increases rainwater and snowmelt infiltration into the ground
- reduces pressure on the city's storm-water system
- prevents erosion.

# 6. Kenai River (Kenai and Soldotna)

**DEC Contact**: Jeanne Swartz, jeanne.swartz@alaska.gov or (907) 269-7523

## Water Quality Goal

**Assess urban runoff pollution.** Collect additional information to identify stormwater pollution sources.

## Solicited Action to Help Reach Goal

### ACTION 1: Perform ambient water quality monitoring for stormwater pollutants of concern on Kenai River tributaries

Collect data to supplement the ongoing interagency water quality data collection for the Kenai River at additional locations. Contact Kenai Watershed Forum (KWF) (call Branden Bornemann at 907-260-5449 x1206) for information on interagency Kenai River monitoring events.

The proposal for this Action should include the following tasks and deliverables:

A. **Planning:**
   1. Expand the existing Sample Plan and Quality Assurance Project Plan (QAPP) to include additional monitoring locations. Select representative sampling sites in the mainstem of the Kenai River downstream of River Mile (RM) 23 and also in the tributaries to the lower Kenai River: Soldotna Creek, Slikok Creek, Beaver Creek and No Name Creek. Also select reference (natural conditions) sampling sites upstream of RM 31.
   2. The sampling plan will be designed so the data objectives and assessment results meet the requirements in DEC's updated *Listing Methodology for Determining Water Quality Impairments from Pathogens* and the *Listing Methodology for Determining Water Quality Impairments from Petroleum Hydrocarbons, Oils and Grease*. Listing methodologies are web available under Final Listing Methodologies: DEC Integrated Report page.
   3. Submit revised QAPP for approval by DEC.

B. **Monitoring**:
   1. At minimum collect samples for all of the same parameters in the existing sampling program.

C. **Reporting**:
   1. Following each sampling event, a brief sampling event summary, a copy of the completed chain of custody forms and field data sheets, site photos, and the laboratory analytical results will be submitted.
   2. Samples will be analyzed, results evaluated, and a draft and final report of findings and conclusions prepared.
   3. Findings will be presented to the Kenai River Special Management Area (KRSMA) Board, representatives for the Cities of Kenai and Soldotna, and the Kenai Peninsula Borough.

D. **Data submission:** The grantee is responsible for ensuring data collected is provided in a format that can be easily transferred to DEC's water quality database (AWQMS). DEC will

provide the grantee with the needed data template for AWQMS and guidance on how to use the template. The grantee should budget time to become proficient in the use of the reporting data template.

**A second year of sampling may be necessary, depending on the results of sampling during the first field season, May-August, 2019.**

## Project Schedule

Projects may be implemented beginning on or near March 1, 2019 and must be completed by February 28, 2021. Suggested schedule:

- March 1, 2019 – April, 2019 (SFY 19)
  - Update QAPP to include selection of additional sites.
- April – June 30, 2019 (SFY 19)
  - Conduct April monitoring (low water conditions).
- July – September, 2019 (SFY 20)
  - Conduct July monitoring (high water conditions).
- October 2019 – March, 2020 (SFY 20)
  - Submit monitoring data results to DEC, in provided AWQMS-suitable template.
  - Present findings.
  - Prepare report of 2019 monitoring.
- April – May, 2020 (SFY 20)
  - Assess need for additional testing.
  - If additional testing is indicated, update QAPP.
- April – June 30, 2020 (SFY 20)
  - Conduct additional April monitoring, if needed (low water conditions).
- July – September, 2020 (SFY 21)
  - Conduct additional July monitoring, if needed (high water conditions).
- October, 2020 – March, 2021 (SFY 21)
  - Submit monitoring data results to DEC, in provided AWQMS-suitable template.
  - Present findings.
  - Preparation and submission of final report.

### ACTION 2: Develop a comprehensive GIS database from available resources that includes potential pollution sources to the Kenai River.

Possible layers for inclusion are: stormwater maps, snow storage maps, NHD+ catchment information, an evaluation of impervious areas adjacent to the Kenai River or its tributaries, potential sources of zinc to the Kenai River that are not part of stormwater runoff (e.g., culvert maps, ELP walkways, and other galvanized metal surfaces), Kenai beaches bacteria results, results from boat count and fishing surveys, fish habitat information and other layers of relevance to Kenai River pollution issues.

## Project Schedule

Projects may be implemented beginning on or near March 1, 2019 and must be completed by February 28, 2021. Suggested timeline:

- March 1, 2019 – June 30, 2019 (SFY 19)
    - Gather elements for comprehensive GIS database from available resources. Includes land use maps, fish habitat information, culvert replacement maps, etc.
- July, 2019 – June 30, 2020 (SFY 20)
    - Completion of comprehensive Kenai River pollution sources GIS map.
    - Incorporate results from 2019 monitoring.
- July, 2020 – February 28, 2021 (SFY 21)
    - Incorporate results from 2020 monitoring, if conducted.
    - Based on mapping effort and results from water monitoring in 2019, and 2020, if available, write comprehensive report, including water quality monitoring results, public comments, and stormwater pollution models.

## Water Quality Concern and Background Information: Polluted Stormwater Runoff

The Kenai River is in the Waterbody Recovery Track with water quality being the primary concern. In 2017, DEC proposed included 7.5 river miles of the lower Kenai River on the 2014/2016 Clean Water Act 303(d) list of impaired (polluted) waters for turbidity pollution in July. This pollution is due to motorized boat activity on the river during sport fisheries.

Additionally, assessment for the 2018 Integrated Report indicate that 16.5 miles of the urbanized (lower) section of the Kenai River exceeds the state acute and chronic criteria for zinc for the aquatic life designated use. Copper is also present in high levels, but currently does not exceed the aquatic life acute or chronic criteria for aquatic life. Zinc and copper are pollutants known to be present in stormwater runoff. Polluted stormwater runoff has been implicated in the deaths of mature silver salmon in Washington State. (Feist, B. E., et al., Roads to ruin: conservation threats to a sentinel species across an urban gradient. *Ecological Applications*, 0(0), 2017, 1–15) and is suspected in the deaths of mature silver salmon in Anchorage's Campbell Creek.

The KWF has undertaken a long-term water quality monitoring effort, starting in 2000 and continuing until the present. KWF's twice-yearly ambient water testing is performed at thirteen locations on the mainstem of the Kenai River and at the confluence of all major tributaries to the Kenai River. Water quality monitoring reports for the Kenai River and a preliminary analysis of potential sources of zinc and copper in stormwater runoff to the Kenai River may be found at: DEC Water Quality Reports page.

# 7. Ketchikan Watersheds and Marine Waters (Ketchikan City and Borough)

**DEC Contact**: Gretchen Pikul; gretchen.pikul@alaska.gov; 907-465-5023

## Water Quality Goals

**Reduce urban stormwater and bacteria pollution.** Develop a planning process and prepare a watershed based management plan designed to address the current pollution sources in Ketchikan and protect high quality waters.

## Solicited Action to Help Reach Goals

### ACTION 1: Develop a watershed plan

Develop and implement a planning process between principal and interested stakeholders (local and state governments) to address the known diverse point and nonpoint pollution source problems throughout the Ketchikan waters. The management plan should address pollution sources in the City and Borough of Ketchikan including the Carlanna, Hoadley, and Ketchikan Creek watersheds as well as marine waters.

The proposal for this Action should include the following tasks and deliverables:

- Use a planning process to develop a watershed based management plan document that evaluates stormwater management options for reducing the pollutants (especially bacteria) entering Ketchikan freshwater watersheds and coastal marine waters from known diverse point and nonpoint bacteria discharges and sources.
- The plan should include, but not be limited to:
    - Discussion of options
    - Work needed to implement each option (e.g., field assessments, new ordinances, etc.)
    - List of partners
    - Timeline
    - Rough cost estimates and potential funding sources
    - Responsible entities for implementation
    - Long-term maintenance needs
    - Projected pollutant reductions
    - Benefits to the receiving water
    - Other environmental and public health benefits associated with each option, including aesthetic appeal and community support.

As much as practicable, the plan will follow the Environmental Protection Agency's (EPA) 9-element watershed planning process (see Guidance 1 at the end of this document). The management plan will consider a watershed approach and also innovative approaches such as green infrastructure and other similar measures as they may provide more sustainable solutions.

Overall the plan will outline actions needed to reach the goal of healthier water in the Ketchikan area through management practices to improve bacteria treatment and stormwater quality (e.g., fewer pollutants). The plan will present options and a process for moving forward. Using sub-contractors is allowable.

**To be eligible, this action must demonstrate support and involvement of, at a minimum, City of Ketchikan, Ketchikan Gateway Borough, Alaska Department of Environmental Conservation (DEC), Ketchikan Indian Community, and other community stakeholders.**


Abbreviated list of EPA's 9 elements for watershed planning. See additional guidance at the end of this document.

Several planning documents may be of interest for management planning. These include:

- 2017 Ketchikan BEACH Monitoring report (DEC Beach Grant page)
- 2018 Ketchikan BEACH Monitoring report (scheduled for completion in December 2018, then posted on Alaska Beach Grant Program website at DEC Beach Grant page)
- 2014 Ketchikan Creeks: Stormwater Quality Assessment (DEC Water Quality Reports page)
- 2018 Ketchikan Creeks: Stormwater Quality Assessment (scheduled for completion in January 2019, then posted on Water Quality Standards, Assessment, and Restoration website at DEC Water Quality Reports page)
- Water quality data from City of Ketchikan, Ketchikan Gateway Borough, DEC Compliance Program, DEC Cruise Ship Program
- EPA's watershed approach EPA Watershed Plan page
- EPA's 9-element watershed planning handbook EPA 9 Element Planning Handbook.

## Project Schedule

Projects may be implemented beginning on or near March 1, 2019 and must be completed by February 28, 2021.

## Water Quality Concern and Background Information: Bacteria & Urbanization - Ketchikan Beaches and Watersheds

Since 2014, DEC partnered with the Aquatic Restoration and Research Institute (ACWA Grantee), Ketchikan Indian Community, City of Ketchikan, and Ketchikan Gateway Borough to evaluate Ketchikan urban creeks for stormwater impacts and coastal marine waters for bacteria pollution.

Several assessments and monitoring reports have been developed to provide an environmental baseline study.

Carlanna, Hoadley and Ketchikan Creeks are in the Protect and Maintain Waterbodies at Risk Track with water quality and habitat being primary concerns. The waterbodies are in the 2014/16 Integrated Report as Category 3 - data or information is insufficient to determine whether the Water Quality Standards (WQS) for any designated uses are attained. The waterbodies have numerous outfalls, surface runoff, and stream bank and flow modifications. The 2014 baseline assessment titled Ketchikan Creeks: Stormwater Quality Assessment (DEC Water Quality Reports page) concluded that ammonia and fecal coliform concentrations exist above WQS, suggesting a wastewater source. Metal concentrations of copper, zinc, and lead in water were above WQS, and copper and cadmium in sediment were above the acute and chronic toxicity screening levels in the National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Table (SQuiRT). Data show a decreasing trend in stream health. Juvenile Coho salmon were found with atypical parr markings (cause undetermined).

Eleven marine beaches along the Ketchikan coastline are in the Protect and Maintain Waterbodies at Risk Track with water quality the primary concern. The Alaska BEACH program was initiated in Ketchikan to evaluate potential health risks by fecal coliform and enterococci bacteria, and to notify the public when levels exceeded state recreation standards. Marine water samples are collected along the Ketchikan coastline to monitor fecal waste contamination during the recreation season. Coastal marine waters were monitored in 2017 from July through September and in 2018 from May through September. Potential bacteria sources present along the Ketchikan coast include: boats in harbor and launch areas, cruise ships, private watercraft and ferries, individual septic tanks, private and/or public sewer treatment system outfall(s), public treatment system emergency bypasses, sewer line breaks, pet feces, and wildlife. The 2017 monitoring results revealed that state recreation water quality standards were exceeded nearly every week from July 24 through August 29 at most of the nine locations. Based on these elevated bacteria levels, and to determine the relative human health risk to beach users, samples were collected on August 8 and 9 for DNA marker testing to help determine the potential source(s). The testing outcome revealed that human fecal waste sources were associated with all of the nine monitoring locations along the Ketchikan coastline. The 2018 monitoring results are currently being evaluated, with a report scheduled for December 2018.

# 8. Lake Lucille (Wasilla)

**DEC Contact**: Laura Eldred, laura.eldred@alaska.gov or (907) 376-1855

## Water Quality Goals

**Reduce urban stormwater pollution.**

1. **Metals**: Reduce stormwater metals copper, lead, zinc, and also polycyclic aromatic hydrocarbons (PAH) in the lake bed sediments at both stormwater outfall discharge areas to support all Water Quality Standard designated uses.
2. **Dissolved Oxygen**: Increase the dissolved oxygen levels in the lake water column by reducing nutrient runoff pollution to support all Water Quality Standard designated uses.

## Solicited Action to Help Reach Goals

### ACTION 1: Develop a watershed plan

The grantee will go through the watershed planning process to develop a Lake Lucille Lake Management Plan designed to address the two water quality impairments: 1) low dissolved oxygen, and 2) lake bed sediments polluted by metals and PAH. The lake management plan can address other issues important to the community as well. However, addressing stormwater must be a primary focus to be eligible for ACWA funding. Stormwater is the conveyance mechanism for both impairments, either through nonpoint source runoff or point source discharges from two stormwater outfall pipes.

The proposal for this Action should include the following tasks and deliverables:

- Use a planning process to develop a Lake Management Plan document that evaluates stormwater management options for reducing the pollutants (especially sediment) entering Lake Lucille from stormwater discharges (i.e., structural, non-structural, retrofitting, etc.).
- The plan should include, but not be limited to:
    - Discussion of options
    - Work needed to implement each option (e.g., field assessments, new ordinances, etc.)
    - List of partners
    - Timeline
    - Rough cost estimates and potential funding sources
    - Responsible entities for implementation
    - Long-term maintenance needs
    - Projected pollutant reductions
    - Benefits to the receiving water
    - Other environmental and public health benefits associated with each option, including aesthetic appeal and community support.

As much as practicable, the plan will include the Environmental Protection Agency's (EPA) 9-element watershed planning process (see Guidance 1 at end of this document). The lake management plan will:

- Engage in a public process to develop the plan
- Use a watershed approach
- Consider innovative approaches for addressing stormwater such as green infrastructure and other similar measures as they may provide more sustainable solutions.


Abbreviated list of EPA's 9 elements for watershed planning. See additional guidance at the end of this document.

Overall the plan will outline actions needed to reach the goal of healthier water in Lake Lucille through management practices to improve the stormwater quality (e.g., fewer pollutants). The plan will present options and a process for moving forward. To be eligible, this action must demonstrate, at a minimum, City of Wasilla, Alaska Department of Transportation (DOT), and Alaska Railroad Corporation support and involvement. Using sub-contractors is allowable.

Several planning documents may be of interest for lake management planning. These include:

- Mat-Su Borough's lake management plans MatSu Lake Management Plans
- Mat-Su Borough's Stormwater Management Plan MatSu Stormwater Management Plan
- EPA's watershed approach EPA Watershed Planning page
- EPA's 9-element watershed planning handbook EPA 9 Element Planning Handbook.

## Project Schedule

Schedule will be dependent on proposal components. Projects may be implemented beginning on or near March 1, 2019 and must be completed by February 28, 2021.

## Water Quality Concern and Background Information: Urbanization

Lake Lucille study reports are available on the DEC webpage DEC Water Quality Reports page.

Lake Lucille is in the Waterbody Recovery Track with water quality being a primary concern. In 1994 the Department of Environmental Conservation (DEC) listed Lake Lucille on the Clean Water Act Section 303(d) list as impaired for low dissolved oxygen from high amounts of nutrients (specifically phosphorous). Increased phosphorus loading led to a reduction in dissolved oxygen. In 2002, a Total Maximum Daily Load (TMDL), or water quality recovery plan, was completed. The

City of Wasilla began using a "weed harvester" in summer months to reduce aquatic vegetation which is expected to help increase the lake's dissolved oxygen level.

In 2017 DEC is proposing to include Lake Lucille on the 2014/2016 Integrated Report's Category 5 (Clean Water Act 303(d) list) as impaired for high concentrations on zinc and lead in lake bed sediments. Concentrations of copper and PAH were also elevated and of concern.

In 2011-2013 DEC conducted stormwater quality studies including sampling lake water quality and lake bottom sediments for metals (copper, lead, and zinc) and PAH. Lake Lucille is a receiving water for the Alaska Department of Transportation (DOT) and City of Wasilla's stormwater drainage system. During rain and snow melt events, PAHs, soils, oils and grease, salts, and metals are washed from parking areas, roads and yards to storm drains that discharge into Lake Lucille. The metals copper, lead and zinc and also PAH pollution in the lake bed sediment are above recommended levels for aquatic life.

There are two active stormwater discharge outfalls into Lake Lucille along the north shore. One is in the east end of the lake and the other in the west end. The areas polluted by metals and PAH are at each outfall discharge point and extend several meters across the lake bed. The east outfall is managed by the City of Wasilla and includes pretreatment by piping the first surge of stormwater to the Iditapark infiltration basins to the north until flow exceeds the pipe's capacity; stormwater is then directly discharged to the lake. The west outfall is managed by the DOT and is a direct discharge only.

The metals copper, lead and zinc and also PAH can deposit into lake bed sediments and over time act as long-term reservoirs of these pollutants. Sources of copper include the wearing of brake linings, combustion of lubricating oils, corrosion of building materials, and wear of bearings and bushings. The main sources of lead are from gas-powered vehicles, gasoline additives, and wearing of vehicle tires. Sources of zinc include wearing of tires, brake pads, and corrosion of galvanized metal such fencing, culverts, building materials and guardrails. Sources of PAH include automobile and truck exhaust, lubricating oils and grease, wearing of road surfaces, coal tar and creosote, among others.

# 9. Little Susitna River (flows to Cook Inlet)

**DEC Contact**: Laura Eldred, laura.eldred@alaska.gov or (907) 376-1855

## Water Quality Goal

**Assess Petroleum Hydrocarbons**: Determine if the Little Susitna River meets total aromatic hydrocarbon (TAH) water quality criteria (WQC) in the month of August using 96-hour average TAH concentrations.

## Solicited Action to Help Reach Goal

### ACTION 1: Conduct ambient water quality monitoring on the Little Susitna for petroleum hydrocarbons

The DEC petroleum hydrocarbon listing methodology requires two years of data to make water quality decisions. This project request will collect water quality information to show if progress is being made in improving TAH levels.

The proposal for this Action should include the following tasks and deliverables:

A. **Planning**: Develop a Quality Assurance Project Plan (QAPP) for DEC approval. DEC has recent examples that may be used with appropriate editing. The sampling must be designed so that results meet the requirements in DEC's *Listing Methodology for Determining Water Quality Impairments from Petroleum Hydrocarbons, Oil & Grease)*. Listing methodologies are available on this page under Final Listing Methodologies: DEC Integrated Report page. Methodology requirements include:
    1. A minimum of 20 samples at each sampling location and the sample results averaged over the entire 4-day period.
    2. Analysis of samples must use EPA method 624 for Total Aromatic Hydrocarbons.

B. **Monitoring**:
    1. Monitoring will occur in the 8.5 river mile impaired stretch of the Little Susitna River upstream and downstream of the PUF boat launch.
    2. Monitoring sites will be the two monitoring locations previously sampled. Site LS-1 located immediately downstream of the PUF boat launch and site LS-4 located 2.5 river miles downstream of PUF boat launch (contact DEC for more details).
    3. The sampling schedule will be temporally spaced to be representative of motorized boat use patterns and comprised of at least one 4-day (96 hour) sampling event in the month of August (2019) during the silver salmon fishery. Sampling in August 2020 will only occur if the August 2019 results meet WQC.
    4. At least part of the 96 hour sampling event period must coincide with anticipated heavy boat traffic based on tracking historic fish run timing. Utilizing information collected at the PUF entrance booth may also be of assistance.
    Use: ADF&G Fish Counts.
    5. Sampling events must also include data collection for:
        a) Discharge
        b) Visual examination for sheen
        c) Water depth
        d) Stream width

e) Number of motorized boats, motor type, and horsepower (in order to determine TAH loading for volume of water). Stop-action photography is recommended with cameras located, at a minimum, near each sampling location to assist in boat count information.

C. **Reporting**:
   1. Within 48 hours following each sampling event, the grantee will submit a brief sampling event summary report including:
      a) Copy of the completed chain of custody forms
      b) Copy of the field data sheets.
   2. The grantee will submit laboratory reports with sample analysis results as soon as available.
   3. The grantee will analyze all samples, evaluate results, calculate TAH loading, calculate statistical correlations to boat counts and engine type, and prepare a draft report for DEC review. The grantee will incorporate DEC comments into a final report of findings and conclusions.

D. **Data submission**: The grantee is responsible for either directly entering their project data into the Environmental Protection Agency's (EPA) water quality database (STORET) or ensuring data collected is provided in a format that can be easily transferred to DEC's water quality database (AWQMS). DEC will provide the grantee with the needed data template for AWQMS and guidance on how to use the template. The grantee should budget time to become proficient in the use of the reporting data template.

**NOTE:** Turbidity monitoring is not part of this request for proposals. However, DEC is open to additional data collection that may help to understand the effects of turbidity on primary production and/or salmonids in the Little Susitna River. This portion of the project should be designed with input from ADF&G and other appropriate subject matter experts. Additional data collection beyond the TAH and basic field parameters may or may not receive ACWA funding.

## Project Schedule

Projects may be implemented beginning on or near March 1, 2019 and must be completed by February 28, 2021. Suggested schedule:

- March 1, 2019 – June 30, 2019 (SFY 19):
  - Spring 2019 – develop QAPP; receive DEC approval on QAPP
  - Early summer 2019 – prepare for sampling
- July 1, 2019 – June 30, 2020 (SFY 20):
  - August 2019 – conduct sampling over a 96-hour period
  - Winter 2019 – analyze results, compare to previous results, prepare draft report for DEC review; conduct data entry
  - Spring 2020 – prepare for sampling
- July 1, 2020 – February 28, 2021 (SFY 21):
  - August 2020 – conduct second year of sampling over 96-hour period. *This sampling will only occur if results from August 2019 meet WQC. For budgeting purposes include in your proposal knowing it may be removed at a later date if needed.*

- Fall 2020 – analyze results, compare to previous results, add data to draft report for DEC review; conduct data entry
- Winter 2020/2021 - Finalize project report and data for submittal to DEC

## Water Quality Concern and Background Information: Petroleum Hydrocarbons

Water quality monitoring reports and other information are available DEC Water Quality Reports page.

Little Susitna River is in the Waterbody Recovery Track with water quality being the primary concern. In 2017, DEC proposed to include 8.5 river miles of the Little Susitna River on the 2014/2016 Integrated Report Categories 4 and/or 5 (Clean Water Act 303(d) list) of impaired (polluted) waters for petroleum hydrocarbon (gasoline) and turbidity pollution. Both pollutants are due to motorized boat activity on the river during sport fisheries.

The river typically receives intensive motorized boat use (primarily upstream and downstream of the Little Susitna River Public Use Facility boat launch) during summer fisheries. The Alaska Board of Fisheries implemented a new regulation effective January 2017 that prohibits fishing from a motorized boat unless the motor is a 4-stroke or direct fuel injected 2-stroke. This action, along with DEC's Clean Boating public outreach campaign, is expected to reduce the gasoline levels in the river. Water quality sampling is needed to demonstrate progress in meeting allowed pollutant limits in the Little Susitna River.

Compounds in gasoline are highly toxic and tend to accumulate in the fats and oils of organisms. These gasoline compounds can impact or kill aquatic organisms such as insects that serve as a food source for fish and wildlife. The negative effects of gasoline can move up the food chain from the aquatic insects to fish to wildlife and potentially to humans. Polluted water can also affect fish and wildlife through direct contact and consumption of polluted river water. Because gasoline contains known cancer-causing compounds (carcinogens) such as Benzene and Benzo(a)pyrene, controlling their concentration in the Little Susitna River is important not only to protecting the environment but ultimately human health.

Turbidity pollution requires an ongoing public and agency dialogue to find solutions (see Stewardship action #4).

# Stewardship Actions

## 1. Increase the Amount Known about Alaska's Waters

### Water Quality Goal

Increase the amount known about high priority waters in the ACWA Data Collection and Monitoring Track.

### Solicited Action to Help Reach Goal

The table below provides a list of high priority waters in the ACWA Data Collection and Monitoring Track which are eligible for proposals under this Stewardship Action. **Proposals will be accepted for one or more of the following actions for the high priority waters in Table 1.**

#### ACTION 1: Perform a data inventory and evaluation

A. Conduct an inventory of information, evaluate, and prepare existing water quality data for inclusion into DEC's water quality data repository, the Ambient Water Quality Monitoring System (AWQMS).
   1. *Inventory:* Include a review of published reports and solicitation of information from local governments and organizations, universities, State and Federal agencies, tribes, and others.
   2. For existing raw water quality data, the grantee is responsible for providing in a format that can be easily transferred to DEC's water quality database (AWQMS). DEC will provide the grantee with the needed data template for AWQMS and guidance on how to use the template.
   3. *Evaluation:* The applicant will compile all information and prepare a draft and final report. Based on the data evaluation, the report should include a summary of data, identification of data gaps, and recommendations for future data collection. The report must also include an annotated bibliography with summaries of all data sources (including unpublished information and personal communications).

#### ACTION 2: Develop a Quality Assurance Project Plan (QAPP) and Sampling Plan

A. The project should be designed to provide a better understanding of one or more of the parameters of concern listed in Table 1 below. At a minimum, the project should also be designed to collect basic water quality parameters (pH, dissolved oxygen, temperature, conductivity and temperature), as well as the parameters of concern, and any other parameters necessary to determine the environment impact of the pollution (e.g. hardness, dissolved organic carbon). The proposal should be designed to obtain sufficient information to reach a determination on whether or not water quality standards for the monitored pollutant are being met. DEC's listing methodologies should be used as guidance for minimum data objectives (see Final Listing Methodologies here: DEC Integrated Report page).

#### ACTION 3: Implement a sampling project

A. Following a DEC approved QAPP (see Action 2 above), implement the sampling project.

1. All samples should be collected in accordance with the QAPP. Parameters monitored should include the waterbody parameters of concern as well as basic water quality parameters (pH, dissolved oxygen, temperature, conductivity and temperature).
2. The grantee is responsible for either directly entering project data into the Environmental Protection Agency's (EPA) water quality database (WQX) or ensuring data collected is provided to DEC in a format that can easily be transferred to DEC's water quality database (AWQMS). DEC will provide the grantee the template for AWQMS.
3. The grantee will analyze all samples, evaluate results and prepare a draft (for DEC review) and final report of findings and conclusions.

**Table 1. High Priority Waterbodies in the ACWA Data Collection and Monitoring Track**

| Region | Waterbody | Parameters of Concern |
|---|---|---|
| Interior | Dry Creek (Nome) | Turbidity, metals |
| | Kotzebue Lagoon (DEC Contaminated Site Database) | Sedimentation, PAH |
| | Wulik River | Metals, mining related parameters |
| Southeast | Sarah Creek | Siltation/sedimentation |
| South Central | Copper River | pH, sediment |
| | Halibut Cove | Petroleum, total suspended solids (TSS), pathogens |
| | Homer Harbor | Petroleum, total suspended solids (TSS), pathogens |
| | Iliamna Lake | Oil and grease; siltation/sedimentation |
| | Nushagak River | Metals |
| | Upper watershed Anchorage waterbodies (outside of Anchorage bowl) | Bacteria (including MST) |

## Project Schedule

Proposed project schedules will depend on project components. Proposals that are designed to collect data should allow adequate time for QAPP development and approval prior to beginning sampling. Projects may be implemented beginning on or near March 1, 2019 and must be completed by February 28, 2021.

## Water Quality Concern and Background Information

The Alaska Clean Water Actions (ACWA) program is a consolidated approach to complete assessment of the health and status of State waterbodies. Alaska's three resource agencies (Departments of Environmental Conservation, Fish and Game, and Natural Resources) work together to characterize waters in a holistic manner, sharing data, expertise and other information. Waters are ranked into one of four primary tracks: Data Collection and Monitoring, At Risk, Recovery, and Adequately Protected. The waters listed above have been identified by the agencies as needing water quality data evaluation and/or collection in order to develop informed next steps.

# 2. Restoration of Impaired Waters

## Water Quality Goal

Reduce pollutant loading on impaired waters in order to meet Total Maximum Daily Load requirements and achieve Water Quality Standards.

## Solicited Action to Help Reach Goal

### ACTION 1: Implement recommendations in approved Total Maximum Daily Load plans

Table 2 below includes a list of waterbodies with approved TMDLs (Category 4a) addressing the nonpoint source priority pollutants (turbidity, sediment, toxics and bacteria) that are eligible for proposals under this action.

The full approved TMDL restoration plans can be found at DEC TMDLs page under the "Approved TMDLs" tab.

Proposals should consider the actions identified in the Implementation section of the waterbody of interest TMDL restoration plan. Applicants interested in submitting a proposal should also contact their regional DEC contact (see contact list on page 5) for the latest information on the waterbody.

**Table 2. TMDL Waters**

| Region | Waterbody | Priority Pollutant |
|---|---|---|
| Interior | Upper Birch Creek | Turbidity and Sediment |
| | Crooked Creek Watershed – Boulder and Deadwood Creeks | Turbidity |
| | Goldstream Creek | Turbidity |
| | Noyes Slough | Petroleum Hydrocarbons, Oils and Grease |
| Southcentral | Red Lake Anton Road Pond | Toxics and other deleterious organic and inorganic substances |
| | Big Lake | Petroleum Hydrocarbons, Oils and Grease |
| | Dutch Harbor | Petroleum Hydrocarbons in benthic sediments |
| | Iliuliuk Harbor | Petroleum Hydrocarbons in benthic sediments |
| | Cottonwood Creek (Wasilla) | Fecal Coliform Bacteria |
| | Chester Creek, including University Lake, Westchester Lagoon | Fecal Coliform Bacteria |

## Project Schedule

Schedule will be dependent on proposal components. Projects may be implemented beginning on or near March 1, 2019 and must be completed by February 28, 2021.

## Water Quality Concern and Background Information

A Total Maximum Daily Load (TMDL) is a process through which pollution sources on impaired waters are identified. The process analyzes waterbody pollution sources and calculates the amount or 'load' of that specific pollutant that the water can receive and still meet Water Quality Standards. TMDLs are a necessary first step toward waterbody recovery. The Implementation Section in the TMDLs are based on the best known information at the time the TMDL was developed, although TMDL implementation is viewed as an iterative process that can change over time.

# 3. Highlight and Protect Healthy Waters

## Water Quality Goal

Support local efforts to address waterbody impairment and/or institute protection measures.

## Solicited Action(s) to Help Reach Goal

Project proposals may include one or more of the following actions:

### ACTION 1: Planning to identify areas for LID/green infrastructure

A. Identify areas within the community that would receive the highest benefit from low impact development (LID) techniques such as green infrastructure projects. This includes those areas most at risk from current and past development patterns and those of highest environmental value (e.g., salmon streams).

### ACTION 2: Design, construct and maintain LID/green infrastructure projects

A. *Design:* Complete a design of a green infrastructure (or other low-impact development best management practice) project. See Guidance 2 for additional Green Infrastructure information. Projects may range from re-design of existing gray infrastructure to a community-specific design book for green streets and parking lots. Design should include a calculation of the environmental benefit (e.g., reduced stormwater run-off).

*B.* *Construction:* Construct one or both of the following:

1. Demonstration project that includes an educational component. The project will allow for a permanent opportunity for local citizens, including elected officials, to see first-hand the value of implementing green infrastructure. The project should be designed to encourage local officials to require LID/green infrastructure (i.e., through adoption in local land use codes).
2. Large-scale LID/green infrastructure project. Applications should include an estimate of the amount of stormwater retained and sediment reduced on-site and a commitment from the landowner to maintain the project.

C. *Maintain:* All constructed projects must have a maintenance agreement as a deliverable.

### ACTION 3: Develop draft ordinance language

A. **Develop draft ordinance(s) to protect water quality (e.g., draft set back or riparian protection ordinance language; LID inclusion in land use codes) for adoption by local governments**. To be eligible for funding, the grant proposal must include project partners (including local planners) to help develop the draft ordinance. The applicant must present the completed draft ordinance to local planning board/commission or other city/borough decision-making body.

## Project Schedule

Schedule will be dependent on proposal components. Projects may be implemented beginning on or near March 1, 2019 and must be completed by February 28, 2021.

## Water Quality Concern and Background Information

**Low-impact development** (LID) is a term used to describe a land planning and engineering design approach to manage stormwater runoff as part of **green infrastructure** or natural systems design approaches. LID, including green infrastructure, incorporates the natural environment and constructed systems that mimic natural processes in an integrated network that benefits nature and people. This approach implements engineered small-scale hydrologic controls to replicate the pre-development hydrologic regime of watersheds through infiltrating, filtering, storing, evaporating, and detaining runoff close to its source. Green infrastructure investments are one approach that often yields multiple benefits and builds community resilience. Guidance 2 at the end of this document has additional information on green infrastructure practices.

# 4. Educate the Public on Water Quality and Smart Practices

## Water Quality Goal

Increase public awareness of pollution problems and best management practices to reduce nonpoint source pollution from turbidity, petroleum hydrocarbons, and/or bacteria in select areas.

## Solicited Action to Help Reach Goal

### ACTION 1: Educate the public on pollutants of concern

Educate the public on water quality and smart practices to prevent pollution from bacteria, petroleum hydrocarbons, or turbidity. The proposed campaign must promote using "smart" practices to reduce water pollution, use several outreach mechanisms, and be designed to reach as many river and lake users as possible within the project's selected area.

**Proposed outreach campaigns must focus on <u>one or more</u> of the following pollutants:**

A. **Turbidity:** Proposals for turbidity outreach are only being solicited for the Cook Inlet region and for areas impacted by placer mining.
   1. For Cook Inlet, users of the following waterways must be included: Kenai River and Little Susitna River to address pollution caused by motorized boating.
   2. For regions or areas impacted by placer mining, the message needs to focus on ways to increase the use of best management practices for water management to reduce turbidity coming from mining practices or to restore historic mining areas. Contact Chandra McGee (chandra.mcgee@alaska.gov) for the most recent version of the handbook.

B. **Petroleum Hydrocarbons:** Proposals for petroleum hydrocarbons are only being solicited for the Cook Inlet region. Contact: Laura Eldred (laura.eldred@alaska.gov), 376-1855, for more information.
   1. Proposals must include specific information for the following waterways: Big Lake, Deshka River, and Little Susitna River.
   2. Proposals should promote using "clean boating" practices to reduce water pollution and be designed to reduce petroleum hydrocarbon pollution in Alaska's rivers and lakes through implementing clean boating practices.

C. **Bacteria** (Statewide or Regional) Proposal ideas include using EPA's Septic Smart (EPA Septic Smart page) to promote a statewide or regional campaign.

**Proposed outreach campaigns must include <u>all</u> of the following components:**

A. **Planning:** Develop an outreach plan that includes the following components:
   a. Goal(s)
   b. Objectives
   c. Key messages
   d. Stakeholders and target audience(s)

e. Communication activities and tools (Any new outreach materials developed should use existing materials to the maximum extent possible).
f. Timeline for implementation
g. Measures of success (such as the number of people reached and whether the outreach has impacted their actions)

B. **Implementation:** Use several outreach mechanisms and be designed to reach as many river and lake users as possible within the project's selected area.
   a. Provide education on the impacts of pollution to waterbody health and on ways to reduce this pollution.
   b. Participate in area sport or boat shows or other public venue (where available/applicable) with a staffed outreach booth.
   c. Demonstrate measureable results and include follow up activity with the public to reinforce the clean boating message.

C. **Final Report:** Include a final project report that describes the outreach activities, public response and an evaluation of success. The report should also include recommendations for future effective outreach activities.

## Project Schedule

Schedule will be dependent on proposal components. Projects may be implemented beginning on or near March 1, 2019 and must be completed by February 28, 2021.

## Water Quality Concern and Background Information

Ensuring individuals take the necessary actions to minimize pollutants is critical to improving water quality. Frequently, people not only need information on what actions they can take, they also need to be convinced that 1) a problem exists, and 2) that their individual actions can reduce pollutants.

### Turbidity

Turbidity is a measure of water clarity in streams, rivers, lakes, and the ocean. Turbidity describes the amount of light scattered or blocked by suspended particles in the water sample. Clear water has low turbidity, and cloudy or murky water has a higher turbidity level. Turbidity is caused by particles of soil, organic matter, metals, or similar matter suspended in the water column. While some turbidity is natural and not dangerous to fish (e.g., glacially influenced streams), studies in Alaska have demonstrated that when relatively low levels (0-5 nephelometric turbidity units, or NTU) of turbidity are present in naturally low turbidity streams, the unnatural increases can, among other effects, interfere with fishes' ability to find food and avoid predators.

Several years of water quality monitoring on the Kenai River and the Little Susitna River have demonstrated increased levels of turbidity caused by motorized boats utilizing the rivers during sport fisheries. In other areas of the state, water quality monitoring has shown increased waterbody turbidity associated with placer mining activities when appropriate BMPs are not used.

Communicating these findings and the importance of reducing turbidity to help create a healthier aquatic environment is a critical next step.

### Petroleum Hydrocarbons

Recent water quality monitoring projects in southcentral Alaska have identified a disturbing trend of increased petroleum hydrocarbon (gasoline) pollution in freshwater rivers and lakes due to motorized watercraft. Examples include Big Lake, Little Susitna River, and Deshka River. Other lakes and rivers may also be effected.

Compounds in gasoline are highly toxic and tend to accumulate in the fats and oils of organisms. This can impact or kill aquatic organisms such as insects that serve as a food source for fish and wildlife. The negative effects of gasoline can move up the food chain from the aquatic insects to fish to wildlife and potentially to humans. Polluted water can also affect fish and wildlife through direct contact and consumption of polluted river/lake water. Because gasoline contains known cancer causing compounds (carcinogens) such as Benzene and Benzo(a)pyrene, controlling their concentration is important not only to protecting the environment but ultimately human health.

DEC initiated a clean boating campaign in 2011 drawing attention to the issue, providing educational information to motorized watercraft users, and participating in events to speak to people about clean boating practices. There are several easy things people can do to help improve water quality while still enjoying Alaska's abundant water resources. Past activity reports are available here: DEC Water Quality Reports page.

While gasoline pollution has been the primary focus of the clean boating campaign, there are other clean boating topics that could be considered as well such as turbidity, trash, cleaning products, and fecal coliform bacteria.

### Bacteria

Many households across Alaska rely on an individual onsite system to treat their sewage wastewater. These are often called "septic systems" or on-site disposal systems (OSDS). These systems are used to treat and dispose of relatively small volumes of wastewater, usually from houses and businesses that are located relatively close together.

Septic systems that are properly planned, designed, sited, installed, operated and maintained can provide excellent wastewater treatment. However, systems that are sited in densities that exceed the treatment capacity of regional soils and systems that are poorly designed, installed, operated or maintained can cause problems. The most serious documented problems involve contamination of surface waters and ground water with disease-causing pathogens and increased nitrates.

Every September the Governor of Alaska joins other states around the nation in declaring a "septic smart" week of outreach activities to encourage homeowners and communities to care for and maintain their septic systems.

DEC is seeking proposals for developing a septic smart outreach campaign with clear messages for homeowners and businesses and effective means for distributing the messages as described in the components listed above.

# Marine Beach Actions

## 1. Kenai Beaches (Kenai)

**DEC Contact**: Jeanne Swartz; jeanne.swartz@alaska.gov; 907-269-7523

### Water Quality Goals

**Assess bacteria pollution.** Evaluate whether bacteria pose a risk to beach users and notify the public when exceedances occur. Evaluate whether Kenai beaches have improved and establish background bacteria levels outside of the fishery and bird migration season.

### Solicited Action

#### ACTION 1: Monitor beaches for bacteria levels and notify users

Monitor Kenai area beaches for a second post-Best Management Practices (BMP) installation recreation season in 2019 to evaluate the magnitude, frequency and duration of the fecal coliform and enterococci levels in the Kenai coastal marine waters; assess 2018 and 2019 data to evaluate whether beach modeling is appropriate using EPA's Virtual Beach model; and assist DEC in notifying recreational beach users of bacteria exceedances. Conduct outreach on the risks of disease and precautions users should take.

The proposal for this Action should include the following tasks and deliverables:

A. **Planning**: Update the 2018 Kenai Beach Sampling Plan and Quality Assurance Project Plan (QAPP) and Beach Monitoring Handbook.
   1. QAPPs will be approved by DEC prior to beginning monitoring.
   2. The plans must meet the requirements in DEC's updated *Listing Methodology for Determining Water Quality Impairments from Pathogens*. The listing methodology is available on this page under Final Listing Methodologies: DEC Integrated Report page.

B. **Monitoring**: Collect weekly water quality samples for fecal coliform bacteria and enterococci during the 2019 recreational use season using the DEC-approved QAPP.
   1. Submit samples for analytical testing to a DEC-approved laboratory.
   2. Proposal should be designed to include weekly sampling at the same 2018 monitoring locations from mid-May through mid-September 2019.
   3. Complete the EPA Marine Beach Sanitary Survey, chain-of-custody forms, and site photos at each monitoring location for each monitoring event.
   4. Following each sampling event, deliverables include sanitary surveys, chain-of-custody forms, and site photos.
   5. Conduct sampling for Microbial Source Tracking (MST) twice during the recreational beach monitoring season.

C. **Notify:** Deliver results to DEC within 4 hours of receipt of lab result. If confirmed exceedance, DEC will issue beach advisory press release.

D. **Outreach**: Develop outreach material to communicate the beach program and sampling results to the Personal Use Fishery (PUF) community and residents of the City of Kenai (COK) and the Kenai Peninsula Borough (KPB). Conduct outreach communication to the PUF, COK and

KPB communities. Outreach should include public service announcements via radio, local newspaper and/or social media, and two area-appropriate communication of meetings, open houses or presentations to the community. Outreach material will be approved by DEC. A presentation will also be made to the Kenai River Special Management Area (KRSMA) Board and the Assembly of the City of Kenai, if requested.

E. **Reporting**:
   1. Following each sampling event, deliverables include analytical data, sanitary surveys, chain-of-custody forms, and site photos.
   2. Evaluate all sample results, and submit a draft and final report of findings and conclusions. Report design should follow the 2018 Kenai Beach Monitoring reports (pending). (DEC Beach page). The report will include background information, and the project need, objectives, and approach taken to meet the project objectives. The report will evaluate and describe project accomplishments, whether beach modeling is appropriate using EPA's Virtual Beach model, describe the environmental benefit, and suggest future actions. Water quality analysis will use the DEC's updated Listing Methodology for Determining Water Quality Impairments from Pathogens, to compare results to the Marine Water Quality Indicator Criteria for bacteria. The report will include narrative description and tabular/graphical formats to evaluate the monitoring results. The report will include a quality assurance review describing the integrity of the reported analytical results as presented in the QAPP and data quality objectives. Appendices will incorporate all project data, and appropriate references.

F. **Data Submission:** The grantee is responsible for or ensuring data collected is provided in a format that can be easily transferred to DEC's water quality database (AWQMS).

## Project Schedule

Projects may be implemented beginning on or near March 1, 2019 and must be completed by February 28, 2021. Suggested schedule:

- March 1, 2019 – June 30, 2019 (SFY 19):
  - Prepare/Update QAPP, 2018 Kenai Beach Sampling Plan and Beach Monitoring Handbook.
  - Begin beach monitoring.
- July 1, 2019 – September, 2019 (SFY 20):
  - Conduct beach monitoring.
- October 2020 – March, 2020 (SFY 20):
  - Analyze results of 2019 beach monitoring.
  - Prepare determination of whether results of beach monitoring in 2018 and 2019 constitute a determination of bacteria present due to natural background conditions.
  - Present findings to KRSMA Board, and Assembly for the City of Kenai, if requested.
  - Evaluate data for Virtual Beach model and conduct Virtual Beach modeling, if appropriate.
- April – May, 2020 (SFY 20)
  - Assess need for additional testing.
  - If additional testing is indicated, prepare/Update QAPP, 2019 Kenai Beach Sampling Plan and Beach Monitoring Handbook.

- May – June 30, 2020 1, 2020 (SFY20) – February 28, 2021 (FY 21):
  - Conduct additional sampling, if needed.
- July – September, 2020 (SFY 21)
  - Conduct additional sampling, if needed.
- October, 2020 – March, 2021 (SFY 21)
  - Preparation and submission of final report (including additional data analysis, if needed).

## Water Quality Concern and Background Information

Kenai Beaches are in the ACWA Recovery Track.

Data from 2010 through 2014 demonstrates that the Kenai public use beaches regularly exceeded water quality standards for fecal coliform and enterococci during the July PUF. Seabird-sourced fecal bacteria comprises the majority of the fecal pollution. Seabirds are attracted to the North and South Kenai Beach by unnaturally large quantities of fish waste present during the fishery. The Water Quality Assessment of the Kenai River Watershed from July 2000 to July 2014 can be found at: DEC Water Quality Reports.

Starting in 2015, the City of Kenai (COK) undertook activities to reduce attractants to seagulls during the PUF. In 2018, a season of recreational beach monitoring took place to determine the effects of the city of COK BMPs. Results from the 2018 beach monitoring show that both enterococci and fecal coliform exceeded state water quality standards on a number of occasions before, during and after the PUF season.

The second year of recreational beach monitoring is needed to establish a natural background level for both enterococci and fecal coliform that are caused by a population of seagulls at a gull rookery located directly upstream from the North and South Kenai beaches. MST testing will be a required component of this project to ensure that the bacteria present on the Kenai recreational beaches is derived from natural background conditions.

# 2. Ketchikan Beaches (City of Ketchikan and Ketchikan Gateway Borough)

**DEC Contact**: Gretchen Pikul; gretchen.pikul@alaska.gov; 907-465-5023

## Water Quality Goal

**Assess bacteria pollution.** Notify beach users when bacteria criteria are exceeded. Determine if Ketchikan beaches persistently exceed bacteria standards.

## Solicited Action to Help Reach Goal

### ACTION 1. Monitor beaches for bacteria and notify beach users

Monitor Ketchikan area beaches for a third recreation season in 2019 to evaluate the magnitude, frequency and duration of the fecal coliform and enterococci levels in the Ketchikan coastal marine waters; assess 2017-2019 data to evaluate whether beach modeling is appropriate using EPA's Virtual Beach model; and assist DEC in notifying recreational beach users of bacteria exceedances. Conduct outreach on the risks of disease and precautions users should take.

If the applicant is interested in developing a Watershed Management Plan for the Ketchikan area, please see the *Ketchikan Beaches and Watersheds ACWA 2019-2020 Waterbody Specific Action* with this ACWA solicitation.

The proposal for this Action could include all of the following tasks and deliverables, or the monitoring task[1] only:

A. **Planning**: Update the 2018 Ketchikan Beach Sampling Plan and Quality Assurance Project Plan (QAPP) and Beach Monitoring Handbook.
   1. QAPPs will be approved by DEC prior to beginning monitoring.
   2. The plans must meet the requirements in DEC's updated *Listing Methodology for Determining Water Quality Impairments from Pathogens* The listing methodology is available on this page under Final Listing Methodologies: DEC Integrated Report page.

B. **Monitoring**: Collect weekly water quality samples for fecal coliform bacteria (SM9222-D by Membrane Filtration) and enterococci (ASTMD-6503-99 by Most Probable Number) during the 2019 recreational use season using the DEC-approved QAPP.
   1. Submit samples for analytical testing to a DEC-approved laboratory.
   2. Proposal should be designed to include weekly sampling at the same 2018 monitoring locations from mid-May through mid-September 2019.
   3. Complete the EPA Marine Beach Sanitary Survey, chain-of-custody forms, and site photos at each monitoring location for each monitoring event.
   4. Following each sampling event, deliverables include sanitary surveys, chain-of-custody forms, and site photos.

C. **Notify:** Deliver results to DEC within 4 hours of receipt of lab result. If confirmed exceedance, DEC will issue beach advisory press release.

D. **Outreach**: Develop outreach material to communicate the beach program and sampling results to the Ketchikan Community. Conduct outreach communication to the Ketchikan community.

[1] Sampling services only, with no analytical test costs, data evaluation or project management.

Outreach should include public service announcements via radio, local newspaper and/or social media, and two area-appropriate communication of meetings, open houses or presentations to the community. Outreach material will be approved by DEC.

E. **Reporting**:
   1. Following each sampling event, deliverables include analytical data, sanitary surveys, chain-of-custody forms, and site photos.
   2. Evaluate all sample results, and submit a draft and final report of findings and conclusions. Report design should follow 2017 and 2018 (pending) Ketchikan Beach Monitoring reports (DEC Beach page).
      a) The report will include background information, and the project need, objectives, and approach taken to meet the project objectives. The report will evaluate and describe project accomplishments, whether beach modeling is appropriate using EPA's Virtual Beach model, describe the environmental benefit, and suggest future actions. Water quality analysis will use the DEC's updated Listing Methodology for Determining Water Quality Impairments from Pathogens, to compare results to the Marine Water Quality Indicator Criteria for bacteria. The report will include narrative description and tabular/graphical formats to evaluate the monitoring results. The report will include a quality assurance review describing the integrity of the reported analytical results as presented in the QAPP and data quality objectives. Appendices will incorporate all project data, and appropriate references.

F. **Data Submission:** The grantee is responsible for or ensuring data collected is provided in a format that can be easily transferred to DEC's water quality database (AWQMS). In addition, the grantee will update the Geographic Information System (GIS) geodatabase and map showing the spatial relationship between residential/public waste treatment and septic, topographic contours, surface water hydrology, potential pollution sources, and beach survey data; provide the data in NAD83/Alaska Albers.

Two documents should be used for this project. These include:

- 2017 Ketchikan BEACH Monitoring report (DEC Beach page)
- 2018 Ketchikan BEACH Monitoring report (scheduled for completion in December 2018, then posted on Alaska Beach Grant Program website at DEC Beach page)

## Project Schedule

Projects may be implemented beginning on or near March 1, 2019 and must be completed by February 28, 2021. Suggested schedule:

- March 1, 2019 – June 30, 2019 (SFY 19):
  - Spring 2019 – Update Sample Plan & QAPP, and Beach Monitoring Handbook.
  - Early May 2019 – Outreach prior to project start.
  - Mid-May - June 2019 - Beach monitoring.
- July 1, 2019 – June 30, 2020 (SFY 20):
  - July – mid-September 2019 - Beach monitoring.
  - Fall 2019 – Analyze results of 2019 beach monitoring.
  - Winter 2019/2020 - Prepare and submit report.

    - Spring 2020 – Outreach to communicate report findings.
- July 1, 2019 – February 28, 2020 (SFY 21):
    - Fall 2019 – Evaluate all data for Virtual Beach model.
    - Winter 2019/Spring 2020 – Conduct Virtual Beach modeling if appropriate.

## Water Quality Concern and Background Information – Ketchikan Beaches

Eleven marine beaches along the Ketchikan coastline are in the Protect and Maintain Waterbodies at Risk Track with water quality the primary concern. The Alaska BEACH program was initiated in Ketchikan to evaluate potential health risks by fecal coliform and enterococci bacteria, and to notify the public when levels exceeded state recreation standards. Marine water samples are collected along the Ketchikan coastline to monitor fecal waste contamination during the recreation season. Coastal marine waters were monitored in 2017 from July through September and in 2018 from May through September. Potential bacteria sources present along the Ketchikan coast include: boats in harbor and launch areas, cruise ships, private watercraft and ferries, individual septic tanks, private and/or public sewer treatment system outfall(s), public treatment system emergency bypasses, sewer line breaks, pet feces, and wildlife. The 2017 monitoring results revealed that state recreation water quality standards were exceeded nearly every week from July 24 through August 29 at most of the nine locations. Based on these elevated bacteria levels, and to determine the relative human health risk to beach users, samples were collected on August 8 and 9 for DNA marker testing to help determine the potential source(s). The testing outcome revealed that human fecal waste sources were associated with all of the nine monitoring locations along the Ketchikan coastline. The 2018 monitoring results are currently being evaluated, with a report scheduled for December 2018.

# Guidance 1 - Watershed Planning

## Overview

Watershed plans consistent with Environmental Protection Agency's (EPA's) nine key elements provide a framework for improving water quality in a holistic manner within a geographic watershed. The nine elements help assess the contributing causes and sources of nonpoint source (runoff) pollution, involve key stakeholders, and prioritize restoration and protection strategies to address water quality problems.

## Understanding the Nine Key Elements

Development of watershed–based plans funded with ACWA funds must be consistent with EPA's nine elements. The elements can be used in watersheds with impaired waters or used to protect watersheds not yet impaired.

The first three elements characterize and set goals to address pollution sources. The remaining six elements determine specific resources and criteria to implement and evaluate the plan. The watershed-based plan may contain additional information but to the extent practicable, should, at a minimum, address these nine key elements.

The nine elements can provide a structure to develop:

- Lake management and protection plans
- River management and protection plans
- Land and water resource management plans
- TMDL implementation plans
- Other watershed-based plans

**Summary of the nine minimum key elements**

1. Identify the causes and sources (to the extent practicable without collecting additional data)
2. Estimate pollutant loading into the watershed and the expected load reductions (to the extent practicable without collecting additional data). For waters with an approved TMDL, refer to the TMDL loading calculations. For waters or pollutants without a TMDL, a rough estimate is acceptable.
3. Describe management measures that will achieve load reductions and targeted critical areas
4. Estimate the amounts of technical and financial assistance and the relevant authorities needed to implement the plan
5. Develop an information/education component
6. Develop a project schedule
7. Develop the interim, measurable milestones
8. Identify indicators to measure progress and make adjustments
9. Develop a monitoring component

## Additional Resources

- EPA's watershed approach website: EPA Watershed Planning page
- EPA's 9-element watershed planning handbook: EPA 9 Element Handbook

## Summary Information from EPA

### "9 Key Elements" for Watershed-Based Plans
**EPA Nonpoint Source (Section 319) Program**

1. An identification of the **causes and sources** or groups of similar sources that will need to be controlled to achieve the load reductions estimated in the watershed-based plan (and to achieve any other watershed goals identified in the watershed-based plan), as discussed in item (2) immediately below. Sources that need to be controlled should be identified at the significant subcategory level with estimates of the extent to which they are present in the watershed (e.g., X number of dairy cattle feedlots needing upgrading, including a rough estimate of the number of cattle per facility; Y acres of row crops needing improved nutrient management or sediment control; or Z linear miles of eroded streambank needing remediation).

2. An estimate of the **load reductions expected for the management measures** described under paragraph (3) below (recognizing the natural variability and the difficulty in precisely predicting the performance of management measures over time). Estimates should be provided at the same level as in item (1) above (e.g., the total load reduction expected for dairy cattle feedlots; row crops; or eroded streambanks).

3. A description of the **NPS management measures** that will need to be implemented to achieve the load reductions estimated under paragraph (2) above (as well as to achieve other watershed goals identified in the watershed-based plan), and an identification (using a map or a description) of the critical areas in which those measures will be needed to implement the plan.

4. An estimate of the amounts of **technical and financial assistance** needed, associated **costs**, and/or the sources and **authorities** that will be relied upon, to implement the plan.

5. An **information/education** component that will be used to enhance public understanding of the project and encourage their early and continued participation in selecting, designing, and implementing the NPS management measures that will be implemented.

6. A **schedule** for implementing the NPS management measures identified in the plan that is reasonably expeditious.

7. A description of interim, **measurable milestones** for determining whether NPS management measures or other control actions are being implemented.

8. A set of **criteria that can be used to determine whether loading reductions are being achieved over time and substantial progress is being made towards attaining water quality standards** and, if not, the criteria for determining whether the plan needs to be revised or, if a NPS TMDL has been established, whether the NPS TMDL needs to be revised.

9. A **monitoring** component to evaluate the effectiveness of the implementation efforts over time, measured against the criteria established under item (8) immediately above.

# Guidance 2 – Green Infrastructure

## Overview

Low impact development, also referred to as "Green Infrastructure" incorporates the natural environment and constructed systems that mimic natural processes in an integrated network that benefits nature and people. The following reference information shows the diversity of green infrastructure practices available depending on site specific conditions and goals.

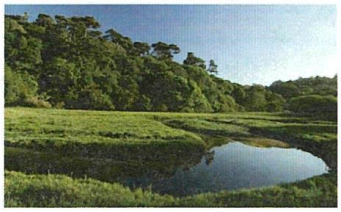
QUICK REFERENCE

# Green Infrastructure Practices

### Maintaining and Acquiring Natural and Open Lands

***Scale***: landscape, watershed, community, shoreline
***Context***: coastal and upland; rural to urban

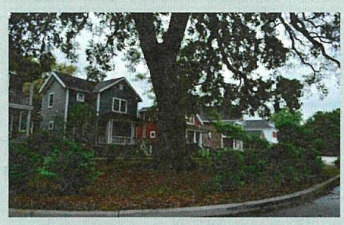
***Examples***: land acquisition, conservation easements, establishing parks and greenways



### Forestry Practices

***Scale***: landscape, watershed, community
***Context***: coastal and upland; rural to urban

***Examples***: urban forestry, street trees, yard trees



### Green Streets

***Scale***: community
***Context***: coastal and upland; suburban to urban

***Examples***: narrower streets, bio-swales, rain gardens

### Bioretention

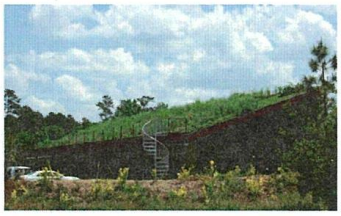
***Scale***: community, site
***Context***: coastal and upland; rural to urban

***Examples***: rain gardens, bio-swales, stormwater planters

### Green or Blue Roofs

***Scale***: community, site
***Context***: coastal and upland; suburban to urban

***Examples***: intensive or extensive green roofs, cisterns, roof drain disconnection
*(over)*



*Source: South Carolina Department of Natural Resources*

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QUICK REFERENCE

### Permeable Pavements

***Scale***: community, site
***Context***: coastal and upland; suburban to urban

***Examples***: permeable concrete and asphalt, paver blocks, gravel and grass pave systems

### Dune or Beach Creation and Protection

***Scales***: shore
***Context***: coastal; rural to suburban
***Examples***: beach nourishment, dune creation, dune revegetation

### Salt Marsh and Tidal Wetlands Protection and Restoration

***Scale***: shore
***Context***: coastal; rural to urban

***Examples***: salt and tidal marsh preservation and restoration, submerged aquatic vegetation preservation

### Oyster and Coral Reef Protection and Restoration

***Scales***: shore
***Context***: coastal; rural to urban

***Examples***: protection of existing reefs, establishment of oyster reefs

*Source: US Fish and Wildlife Service*

### Hybrid Practices

***Scales***: shore
***Context***: coastal; rural to urban

***Examples***: coupling hard infrastructure with natural systems such as a rock sill or breakwater with marsh grasses behind. Particularly useful in higher energy environments

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