



Ethan Berkowitz, Mayor

2018 Stormwater Outreach Public Education and Involvement APDES Permit No. AKS-052558

**MUNICIPALITY OF ANCHORAGE
WATERSHED MANAGEMENT PROGRAM**

February 1, 2019

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Prepared for:

Municipality of Anchorage
Watershed Management Services

Authored and Prepared by

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Final Report for Year Three Activities
by Anchorage Waterways Council
on
the Municipality of Anchorage's
APDES MS4 Stormwater Discharge Permit,
AKS-05258 2015-2020

By Cherie Northon, Ph.D, Executive Director
February 1, 2019



Introduction

Year Three activities continued fairly close to previous years with the exception of two new areas of focus. One was a larger emphasis on the role of plastic pollution in waterways, and the other was tracking issues brought about by the increased presence of homeless populations along creeks. These two topics will be discussed in the appropriate section of the report. The report is organized by the “parts” designated in the 2015-2020 contract for services with the Anchorage Waterways Council APDES AKS-05258.

Part 2.7.1 & 2.7.2—Evaluate at least two watershed plans – under “General Requirements” by fourth year.

“Chester Creek Watershed Plan – 2014”

This watershed plan was adopted by the Anchorage Municipal Assembly during their May 14, 2014, meeting and is 83 pages, including 32 figures and 10 tables.

Beginning in Year One of the 2015 permit, AWC began to review Table 6.1, “Restoration Priorities for Chester Creek Watershed”, for updates and completion. Several of the 75 action items have been completed, although there are some items that need clarification and further investigation. Two major projects on the South Fork of Chester Creek at Muldoon resulted in moving part of Chester Creek into a more natural creek alignment upstream and replacing a highly inadequate culvert for fish passage under Muldoon with a large box culvert to reconnect the creek. Comments have been made in Table 6.1, Section 2.

During Year Two there was less progress in the Chester Creek watershed than the previous year, which may have been a result of the large Alaska Department of Transportation and Public Facilities (AKDOT&PF) project on the Seward Highway that was beneficial to Little Campbell Creek. The Chester Creek culverts in Table 6.1 that are noted as needing to be upgraded were reviewed against Alaska Department of Fish and Game’s (ADF&G) Fish Passage Improvement Program (FPIP) interactive mapper¹. One issue between Table 6.1 and the FPIP involved mistakes on the culverts’ status or culvert number. This has been corrected in the current version of Table 6.1. Also, several of the culverts listed have had their status changed through upgrading or downgrading, but their status has not been updated in the mapper. There are notes on some of the individual culvert’s pages that state when it was upgraded or replaced, but it appears that until an official survey is made by ADF&G, the information is not updated on the map. Hence, when looking just at the map—there are several culverts showing that are black, gray or red when they may have been upgraded and are now green. These have been noted in Table 6.1 along with a few corrections on culvert numbers.

Year Three of the action items saw less than the past two years. The main action item that was part of both this plan and the Little Campbell Creek Watershed Plan was the creation of an online interactive map for floodplain mapping at moapw.maps.arcgis.com/apps/Viewer/index.html?appid=1687cdfa5f1e499d985e734dff9cc72f . The second item is the adoption in the Municipality’s Anchorage Municipal Code Title 21.07.020 (Natural Resource Protection) provision for stream setbacks. This is intended to ameliorate problems in floodplain

¹ adfg.alaska.gov/index.cfm?adfg=fishpassage.mapping

areas. Additionally, AWC completed a report on creek signage from major streets and highways, which can be found in Section 2. The expansion of the MOA's GIS datasets, especially WMS, has been a great boon for creek projects.

“Little Campbell Creek Watershed Management Plan – 2007”

This watershed plan resulted from increased concerns about high juvenile fish mortality in Little Campbell Creek around 2005. The plan was adopted by the Municipal Assembly in December 2007, and is 55 pages long with 14 figures and 3 tables. Table 5.1 “Restoration Opportunities” has 29 Priorities Listed, some with multiple action items. AWC first reviewed the Little Campbell Creek Watershed Management Plan in 2013 as part of APDES permit tasks. Broadly speaking, parts of ten priorities had been accomplished as of September 15, 2013.

Since then, progress on the action items has been ongoing (all are listed in Section 2). During 2018, there have been three major changes. The first is an online interactive floodplain map at moapw.maps.arcgis.com/apps/Viewer/index.html?appid=1687cdfa5f1e499d985e734dff9cc72f. The second is the adoption in the Municipality's Anchorage Municipal Code Title 21.07.020 (Natural Resource Protection) the provision for a 50' stream setback. This is intended to ameliorate problems in floodplain areas. The last change addresses action item 6.2 “to increase community understanding of watershed problems and solutions within watershed”, and it is by way of changes to the MOA's Design Criteria Manual. This means that natural vegetation and wetlands retention are identified as a specific BMP available for control of stormwater runoff volume and quality, which is intended to help incentivize preservation of wetlands and other riparian habitat during site development.

Part 2.7.3—“Complete scoping document for one watershed plan” by fifth year – Section 2

A preliminary scoping document was completed on February 1, 2019.

Part 3.3.3—“Evaluate animal facility program” by third year – Section 3

The animal facility program report was completed on February 1, 2019.

Part 3.6.1—“Public Education and Involvement” - Section 4

AWC promotes public education on stormwater by focusing on a variety of topics that affect water quality. The primary ones are pet waste; waterfowl feeding; the application of fertilizers, herbicides, and pesticides; disposal of green waste; snow melt chemical applications and snow removal; residential vehicle repairs and car washing; and hazardous waste and materials. During Year Three, AWC ramped up its efforts by addressing plastic pollution which encompasses such items as cigarette butts, plastic bottles and bags, and monofilament fishing line. The impacts of plastic were the topic of AWC's 2018 annual meeting as well as some publications. The other area of recent concern in Anchorage is on the effects of homeless camps in terms of human waste and trash. This was particularly evident during our May 2018 Creek Cleanup as well as observations by creek volunteers and staff.

Outreach is accomplished through a variety of avenues: events, social media, e-newsletters, mailings, presentations, publications, and regular TV/radio/news media. AWC's emphasis has shifted heavily towards social media because of its ability to instantly put a message in front of thousands². AWC's Facebook page (facebook.com/anchoragewaterways) general posts between January 1, 2018, and December 31, 2018 reached 54,000 people in Anchorage exclusive of AWC's Scoop the Poop (facebook.com/ScoopthePoopAnchorage/) posts.

Pet Waste—SCOOP THE POOP

One of the most important programs geared toward stormwater outreach is a reduction in pet waste that is not picked up. Every creek in the Anchorage "Bowl" with the exception of one, Rabbit Creek, has a fecal coliform impairment. Campaigns to get people to pick up their pet waste have been ongoing for years by AWC, and a more concerted effort has been undertaken since working with the MOA on its APDES permit beginning in 2010.

- AWC attends all major pet events. During Year Three, AWC tabled at three pet-focused events, Friends of Pets' Dog Jog (7/28/18), Alaska Mill and Feed Pet Day (8/4/18), and AWC's annual Scoop the Poop Day (4/28/18), which was held at 3 dog parks. Other events where Scoop the Poop information was provided included the Sears Mall Annual Garden Show (4/7/18), Migratory Bird Day at the Alaska Zoo (5/20/18), Potter Marsh Day, and the Fish Creek Festival (9/8/18) at Woodland Park. The exposure at these events was over 3,000 people.
- AWC provides educational literature, displays, giveaway items, and drawings based on a simple set of survey questions at these events.
- AWC also responds to complaints about dog poop by assisting with signage, door hangers, and handouts; and staff even visit HOAs and condo associations, multi-family dwellings, neighborhoods, and individuals upon request.
- STP Committee meetings are convened by AWC annually.
 - The upcoming year's outreach events/calendar are planned
 - Scoop the Poop Day (3-4 parks) in April is organized and run by AWC
 - Several aspects of improving the pick up of pet waste are addressed at these meetings
- AWC generates media stories on radio and TV and in the newspaper.
- AWC does selective mailings to pet-related businesses to offer help and resources.
- Scoop the Poop is on Social media (Facebook), and from January 1, 2018 to December 31, 2018, AWC Scoop the Poop posts have reached over 35,500 people in the Anchorage area. The more relevant posts are boosted to reach a larger Anchorage audience.
- Schools are visited for Scoop the Poop outreach, and AWC staff work with students on science projects involving *E. coli*.
- Stationary locations are provided with Scoop the Poop information. In 2018 approximately 1,000 rack cards were placed at various locations including Alaska Mill and Feed, Alaska Veterinary Clinic,

² In 2018 it is estimated that 77% of the U.S. Population has a social media profile according to www.statista.com/statistics/273476/percentage-of-us-population-with-a-social-network-profile/

and David Jensen Photography. Five hundred brochures were provided to Animal Care and Control to be included in their pet adoption packets.

- Beginning in 2016, AWC received funding from Alaska Department of Environmental Conservation (ADEC) to evaluate the location of pet waste stations and make recommendations for adding new ones. This resulted in the addition of 27 new pet waste stations which have been mapped along with existing ones. See Section 4.



Figure 1. Kyle Cunningham (MOA WMS) helping at Scoop the Poop Day 2018

Animal Waste—Waterfowl Feeding

In July 2015, AWC received funding from ADEC to assist in reducing levels of fecal coliform in Anchorage’s creeks and lakes. In addition to funding more pet waste stations, the goal was to abate a growing trend of people feeding waterfowl at local ponds and lakes—mainly at Cuddy Family Midtown Park. Over 30 stakeholders joined together to provide their perspective on the Cuddy issue. By July 2016, BMPs had been put into place at Cuddy Park, which consisted of four interactive signs (Figure 2). Extensive landscape work and fencing was done by MOA Parks and Rec, which was also paid for by an ADEC grant. Additionally, five bus signs were placed on PeopleMover (Figure 3) buses for 17 weeks during summer 2016, 7 weeks during summer 2017, and for 13 weeks (5 additional weeks were donated by the Alaska Channel) during summer 2018. The 2017 and 2018 runs were paid by APDES funds.



Figure 2. Interactive sign at Cuddy Park



Figure 3. Bus signs

The work to date is showing success based on water samples processed for fecal coliform by SGS Laboratories, and from observation and face-to-face surveys during 2016 and 2017. The following table shows the dramatic decline between July 2014 and September 2018.

We are extremely pleased with the results of this endeavor, and expect the trend of lower FC levels to continue³. And, SGS is going to sponsor testing again during summer 2019.

Table 1. <i>E. coli</i> colonies/100 ml of water, 2014 to 2018		
Date	Entering Pond	Waterfowl Area
7/21/2014	880	18,000
8/05/2015	6	8000
4/14/2016	0	500
5/18/2016	35	3,000
6/20/2016	126	1,770
7/7/2016	820	4,000
8/3/2016	70	4,300
9/13/2016	27	230
5/30/2017	29	54
6/19/2017	5	31
7/14/2017	19	106
8/21/2017	20	1,500
9/14/2017	7	36
5/15/2018	49	10
6/18/2018	1900	37
7/20/2018	58	122
8/16/2018	64	733
9/12/2018	12	22

³ The entire paper is in section 4.

Human Waste—Homeless Issues

Homeless camps along Anchorage’s trails, in parks, and by creeks are not a new issue, however 2018 presented an awareness that the camps had expanded into several new areas. Initially most camps were along Chester Creek, but they are now found in greater abundance along Campbell. Creek Cleanup volunteers provided several reports and photos of the trash strewn about as well as confirmation that there is human waste along the creek banks and gravel bars. The following photo (Figure 4) was taken on Campbell Creek just east of Brayton by the CRW Engineering team during Creek Cleanup. There is a tent behind the willows, and human waste, toilet paper, and trash were found along the creek.



Figure 4. Campbell Creek east of Brayton Upper arrow points to a tent, the lower arrow shows where the creek bank is being used as a latrine. (CRW Engineering 2018)

There were other homeless camp reports from teams on Campbell Creek this year for the first time. The USFWS cleaned between the Peanut Farm and Dowling and found 2 camps on the west side of the creek (54th to 56th), Team GCI and Team Roberts both reported homeless camps between C St. and Taku Lake, and there have been numerous reports of camps and trash along the Campbell Creek trail between Lake Otis and

Piper. We are actively working to report them using the Municipality’s “AncWorks Camps” app. A sampling plan using microbial source tracking (MST) might be useful in evaluating the effects of human waste on local creeks.

Effects of Plastics on Water Quality

As mentioned, AWC is taking a strong stance on the problems with plastics in the environment. It’s difficult to not be familiar with the horrible scenes of plastic littering hundreds of square miles of ocean or injuring and killing birds, turtles, marine mammals, and other wildlife. The irony of this is that the problem originates right at our doorstep in watersheds. Making this connection between the local and the global is an important step in reducing plastic waste.



Figure 5. North Fork Little Campbell Creek (C. Northon)



Figure 6. Cigarette butts on Old Seward (C. Northon)

AWC’s 2018 Annual Meeting on April 17 was titled, “Plastics’ Impacts on our Aquatic Environment”. There were three presentations:

1. Mary Fisher, executive director of Alaskans for Litter Prevention and Recycling (ALPAR), discussed “The Problem with Plastics and Mixed Paper Recycling—What’s Next?”. This addressed how single-stream recycling has become more efficient as well as problematic which undoubtedly influenced China’s “National Sword” policy in rejecting recyclables from the U.S. due to contamination. Contamination in this sense is from non-recyclable trash (disposable diapers!) or recyclables that are tainted. An example would be a pizza box that is recyclable, but it has grease from the pizza on it which makes it contaminated. Or, plastic bags that have been put into the comingled recycling container which, when run through the sorting machinery, gums it up and stops the entire process. AWC is working with ALPAR to educate the public on this.

2. Chris Pallister, co-founder of Gulf of Alaska Keeper (GoAK), presented “Marine Debris along the Northern Gulf of Alaska”. This was a very compelling talk about the amount of plastic debris on Alaska’s shores from local and global sources.
3. Tamara Zeller, a biologist with the U.S. Fish and Wildlife Service (USFWS), spoke on the “Impacts of Plastics on Birds—the Menace of Monofilament to Waterways and Wildlife”. Tamara works first-hand in Anchorage’s waterways to rescue birds that have become entangled in monofilament and other plastic discards.

Attendees at the meeting provided us with great feedback about the program. This is the second time an AWC annual meeting has presented on plastics—and it will not be the last.

Yard Chemicals (Ice melt, fertilizers, pesticides, herbicides)

Other outreach activities aimed at reducing yard chemicals, ice melt products, and the spread of invasive plants included tabling at the Alaska Botanical Garden’s 11th Annual Spring Garden Conference on March 3, 2018, and the annual Sears Mall (now Midtown Mall) Spring Garden Show on April 7, 2018. These events are used to give out information as well as have attendees fill out survey forms that focus on individual gardening practices which AWC tabulates.

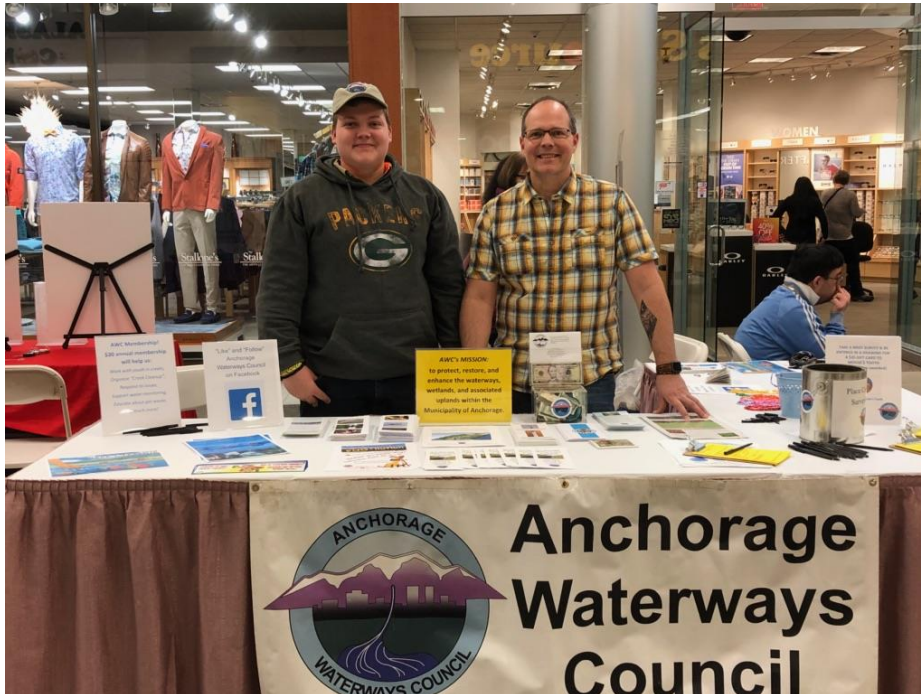


Figure 5. AWC board member Robert McFadden and youth board member Liam McFadden 2018 Sears Garden Show

AWC also put out a flyer in the Anchorage Convention and Visitors Bureau (ACVB) January 2018 newsletter about the proper use of ice chemicals. And, a general one on the value of clean and healthy waterways was placed in the July 2018 newsletter. Each of these newsletters reached 1800 members—most who run businesses in Anchorage. (See Section 4)

News Media

During 2018, AWC participated in one major news story on Oct. 19, 2018, “Don’t feed the ducks’ is working: Water quality at Cuddy Pond has drastically improved”. And, AWC contributed to another titled, “Fecal matter contaminates city streams, can make you sick” on April 24, 2018. (See Section 4)

Social Media

Facebook posts from AWC on watershed issues and Scoop the Poop have reached nearly 90,000 people in Anchorage this year.

AWC E-Newsletters

AWC put out 2 e-newsletters associated with APDES outreach during 2018, and there were 1,492 “opens”. The newsletters were also posted on Facebook (www.facebook.com/anchoragewaterways/) and reached hundreds of others through this manner. (See Section 4).

1. “Plastics vs. Waterways, pt. 1”, 2/15/18
2. “Plastics vs. Waterways, pt. 2”, 6/25/18

AWC Publications

The American Canoeing Association received a copy of “Plastics vs. Waterways, pt. 1” by way of the AWC e-newsletter. AWC was approached about submitting it to *Paddle*, their e-magazine. (At americancanoe.org/page/Paddle), and it was published in their March 2018 issue. The followup article was published in their July 2018 issue. (See Section 4). Membership in the American Canoeing Association is ~50,000.

Part 3.6.3—“APDES Annual Meeting” each year – Section 5

AWC made a presentation at the 2018 APDES Annual Meeting on March 8, 2018, titled “MOA Watershed Plans Update: Chester and Little Campbell Creeks”. It was well received, and this is important to AWC because of our work on the new watershed plan as well as the updates on the two existing. The presentation is in Section 5. AWC also prepared a poster, “Chester Creek Watershed Plan (2015) Implementation Progress” which is in Section 5.

Conclusion

During Year Three of the 2015-2020 APDES permit, AWC focused on areas that had been prioritized after the review of Year One. Implementation of tasks was also sparked by the action items in the two watershed plans. There were some action items in the plans that AWC was the lead on, such as outreach targeting specific groups along creeks on issues, assessing and documenting success (or not) on action items that had been completed, and creating some resources, such as a public access map along Little Campbell Creek.

AWC continues to find that printed materials, such as rack cards in stationary locations, are not that likely to be picked up and read. To the contrary, bus signs tend to hit a smaller audience although they do have a good impact as suggested in the face-to-face Cuddy surveys. As was realized last year, social media and the regular media are probably a much better way to get information out, and AWC will continue to expand efforts in these areas. Tabling, which is mostly a one-on-one situation, is also effective, but reaches a much smaller audience. Regardless, it is an important tool. An array of outreach methods is definitely the best means of reaching a broader audience.

AWC is looking forward to Year Four of the APDES permit and has already started working on new outreach areas as well as continuing the current projects.

Watershed Plan Update and Evaluation

2018 Preliminary Scoping for Campbell Creek Watershed Plan

APDES Permit No. AKS-052558

By

Cherie Northon, Ph.D.
Anchorage Waterways Council

February 1, 2019



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1. Background of Campbell Creek Watershed

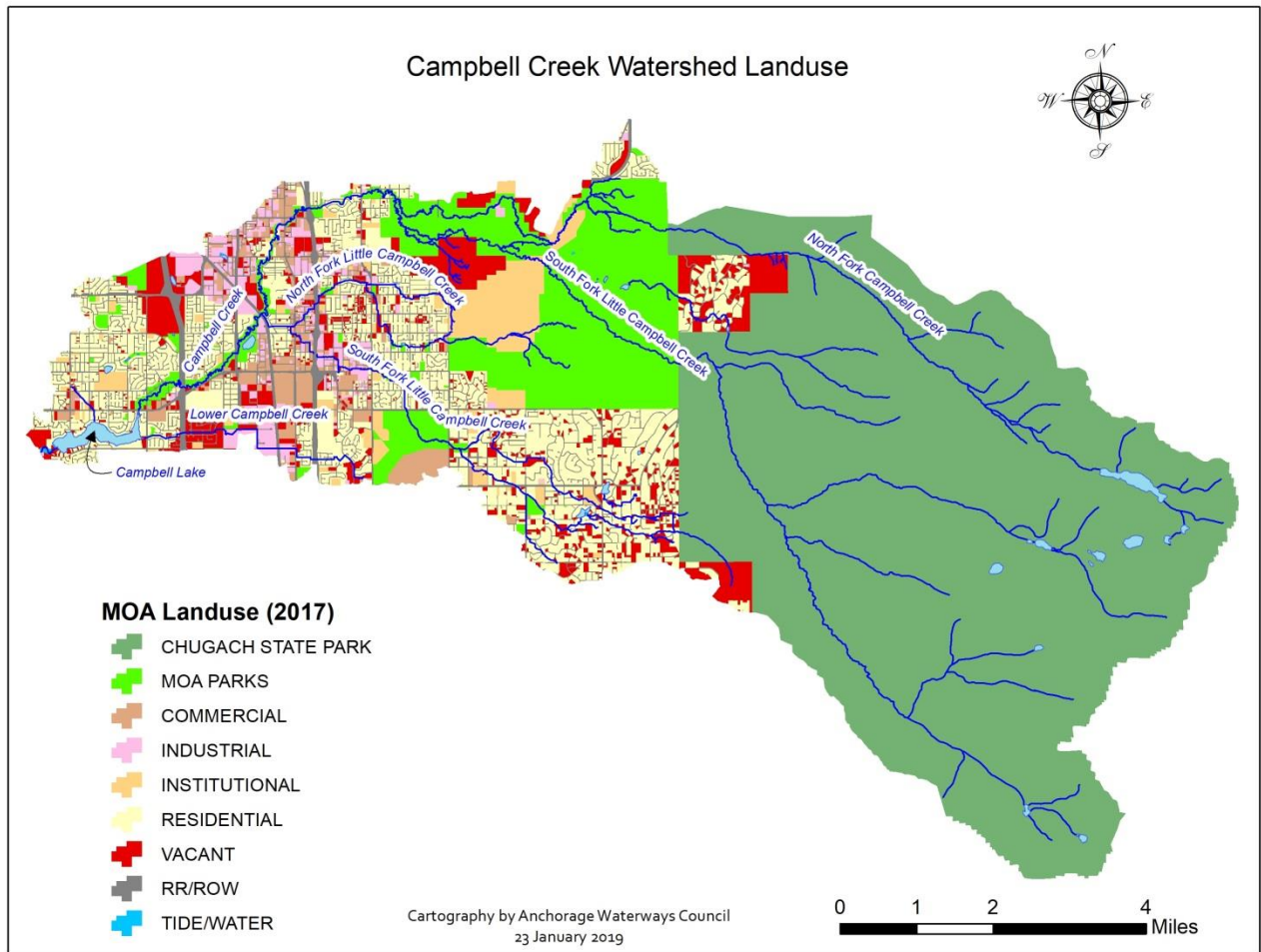
A watershed is an area whose topography collects and routes water that falls as rain, melts from snowpack, flows from springs, and collects by gravity into a drainage system. The Campbell Creek watershed is approximately 72 mi² which includes drainages for its main tributaries— South Fork Campbell Creek, North Fork Campbell Creek, and Little Campbell Creek. The upper portion of Campbell Creek watershed includes a portion of Chugach State Park which is characterized by forested land and relatively steep gradients. The lower watershed has gentler slopes and is predominately residential and developed lands. Campbell Lake, approximately 125 acres with a shoreline of about 3.5 miles, is located in a suburban portion of south Anchorage at the downstream end of Campbell Creek just upstream from the creek’s outlet to Turnagain Arm.

Because of the watershed’s extent into Chugach State Park and Far North Bicentennial Park, the majority of the watershed, about 73%¹, is considered as park and open space (Map 1). The lower half and balance of the watershed consists of residential, commercial, and industrial. The upper reaches of North Fork and South Fork Campbell Creek flow in a northwesterly direction until their confluence near E. 48th Ave. in the Campbell Creek Greenbelt. From there Campbell Creek meanders west through the greenbelt about a half a mile before running to the southwest into Campbell Lake.

Campbell Creek watershed supports a wide range of fish and wildlife species from salmon to bears, and its extensive greenbelt area has a multitude of trails for walking, running, hiking, biking, skiing, skijoring, mushing, and horseback riding. The creek is the best source for rafting and kayaking (secondary contact recreation) in urban Anchorage. From the confluence of the North and South Forks, one can travel approximately 8 miles unimpeded except for downed trees and log jams. During warm weather, it is not uncommon to see children splashing in the creek at various locations—Campbell Park being one of the most popular. Fishing is also a common activity and is open for salmon (silvers) beginning on July 14 between Dimond Blvd. and Shelikof St. Areas above and below this designated stretch are, however, closed to fishing year-round.

In addition to its many positive attributes Campbell Creek has a multitude of problems that harm the creek’s biotic community, limit recreational and economic opportunities, and impair its aesthetic qualities. Degradation of water quality and important habitats along with loss of natural productivity and biodiversity are concerns throughout the lower half of the watershed.

¹ Alaska Department of Environmental Conservation. 2006. “Total Maximum Daily Loads (TMDLs) for Fecal Coliform Bacteria in the Waters of Campbell Creek and Campbell Lake in Anchorage, Alaska”, p. 13.



Map 1 – Campbell Creek Watershed Land Use

2. Watershed Plan Scoping Committee

In the Municipality of Anchorage’s 2015 APDES permit AKS-05258 2015-2020, one requirement is Part 2.7.3 which states that “[t]he permittees must complete a scoping document for one individual watershed plan for a specific water body prior to the expiration date of this permit. The scoping document must identify whether activities carried out in the watershed are beneficial in accomplishing site-based LID practices and recommend future actions to obtain identified goals. The scoping document shall include consideration and discussion of the principles described in Parts 2.7.1.1 to 2.7.1.5. The scoping document will be used to determine if a watershed plan will be developed in the next permit cycle²”.

² Alaska Department of Environmental Conservation. 2015. “Anchorage Municipal Separate Storm Sewer System Individual

There is obvious value in a watershed plan. The *Campbell Creek Watershed Plan* would be a tool for planners, scientists, community members, and others to make decisions that will slow further declines and enhance the positive characteristics of the watershed. The goal is to describe the area’s resources, address social and environmental concerns, and identify development and activities that are most beneficial to the watershed as a whole. It will recommend policies and objectives compatible with maintaining urban development and preserving a healthy watershed that is a centerpiece of the community.

Anchorage Waterways Council (AWC) has been tasked with the scoping process in this permit. In 2016, AWC gathered a committee to begin the process. Table 1 shows the members.

Table 1 Campbell Creek Watershed Plan Scoping Members

Name	Organization	Title
Cherie Northon	Anchorage Waterways Council	Executive Director
Thom Eley	Anchorage Waterways Council	Research Associate
Kristi Bischofberger	MOA Watershed Management Services	Manager
Kyle Cunningham	MOA Watershed Management Services	Environmental Specialist
Franklin Dekker	U.S. Fish and Wildlife Service	Hydrologist/Habitat Restoration
Megan Marie	Alaska Department of Fish and Game	Habitat Biologist
Jacob Cunha	Alaska Department of Fish and Game	Fishery Biologist
Jeanne Swartz	Alaska Department of Environmental Conservation	Environmental Program Specialist

The first committee meeting was held on July 21, 2016, and a number of options were discussed for choosing the next watershed for a plan. Some of the factors considered were:

- Is the waterway anadromous?
- What is the size and population of the watershed?
- What is its level of development—heavily, going through development, or undeveloped?
- Is there good and accessible recreational value?
- Are there issues regarding flooding and fish passage?
- What is the state of riparian vegetation?
- What potential partnerships are there?
- Is environmental justice a concern?
- What funding opportunities exist?
- What educational opportunities are there?
- What is the status of fish and wildlife?

After a very positive discussion, the group chose the Campbell Creek watershed for the scoping plan. The benefits are:

1. Little Campbell Creek , a subwatershed to Campbell Creek, has a plan in place and this would complete a large, well known watershed.
2. It has good headwaters; minimal (three) culverts that impede fish passage; high-use recreation activities of kayaking, canoeing, rafting and fishing; lots of greenbelt area; and good opportunities for educational projects.
3. There are still meanders which are causing changes in the morphology regularly, and there are restoration opportunities (including LID) that can be done and those that have been completed can be evaluated.

There are also substantial issues with Campbell Lake which has “nuisance aquatic vegetation”, and there is concern about wildlife corridors along the entire waterway. Campbell creek is on the state’s impaired waterway list for fecal coliform. Fortunately, there is a 2006 TMDL³ that provides some good data and background for the overall watershed and Campbell Creek’s fecal coliform impairment, and there is quite a bit of long-term water quality monitoring data available.

During 2017, AWC did field work to gather information on Campbell Creek which was presented to the committee during a scoping meeting on April 4, 2018. A decision was made on the plan’s format, which would follow that of the 2014 *Chester Creek Watershed Plan* with some changes. The three Campbell Creek culverts were discussed with special concern about the “radio tower culvert” (Figures 1 and 2). Alaska Department of Fish and Game’s (ADF&G) fish passage rating⁴ for them is red. Red means “Conditions at the crossing are likely to be inadequate for fish passage”⁵. There is a pair of culverts (Figures 3 and 4) under a sewer line about 750’ west of the spillway on Campbell Lake, and the concern expressed for fish passage was due to their being subject to tidal action. These culverts are coded gray for “conditions at the crossing may be inadequate for fish passage”. The farthest upstream of the three culverts is on the North Fork of Campbell Creek at Campbell Airstrip Road (Figure 5), which is coded red.

³ Alaska Department of Environmental Conservation. 2006. “Total Maximum Daily Loads (TMDLs) for Fecal Coliform Bacteria in the Waters of Campbell Creek and Campbell Lake in Anchorage, Alaska”.

⁴ At adfg.alaska.gov/index.cfm?adfg=fishpassage.database.

⁵ Eisenman, M., and G. O’Doherty. 2014. *Culvert inventory and assessment for fish passage in the State of Alaska: A guide to the procedures and techniques used to inventory and assess stream crossings 2009-2014*. Alaska Department of Fish and Game, Special Publication No. 14-08, Anchorage. P. 1.



Figure 1 - Radio Tower culvert (ADF&G #20401888) Inflow (Photo by T. Eley 2017)



Figure 2 - Radio Tower culvert (ADF&G #20401888) Outflow (Photo by T. Eley 2017)



Figure 3 – Culverts (ADF&G 20401812) 750' west of the Campbell Lake spillway (Photo by ADF&G⁶, 2010)



Figure 4 – Location of culverts by Campbell Lake (Image from GoogleEarth, 2014)

⁶ At adfg.alaska.gov/sf/reports/FishPassage/rptSite.cfm?site=20401812.



Figure 5 – Inflow culvert (ADF&G #20400085) on the North Fork of Campbell Creek (Photo by T. Eley, 2017)



Figure 6 – Outflow culvert (ADF&G #20400085) on the North Fork of Campbell Creek (Photo by T. Eley, 2017)

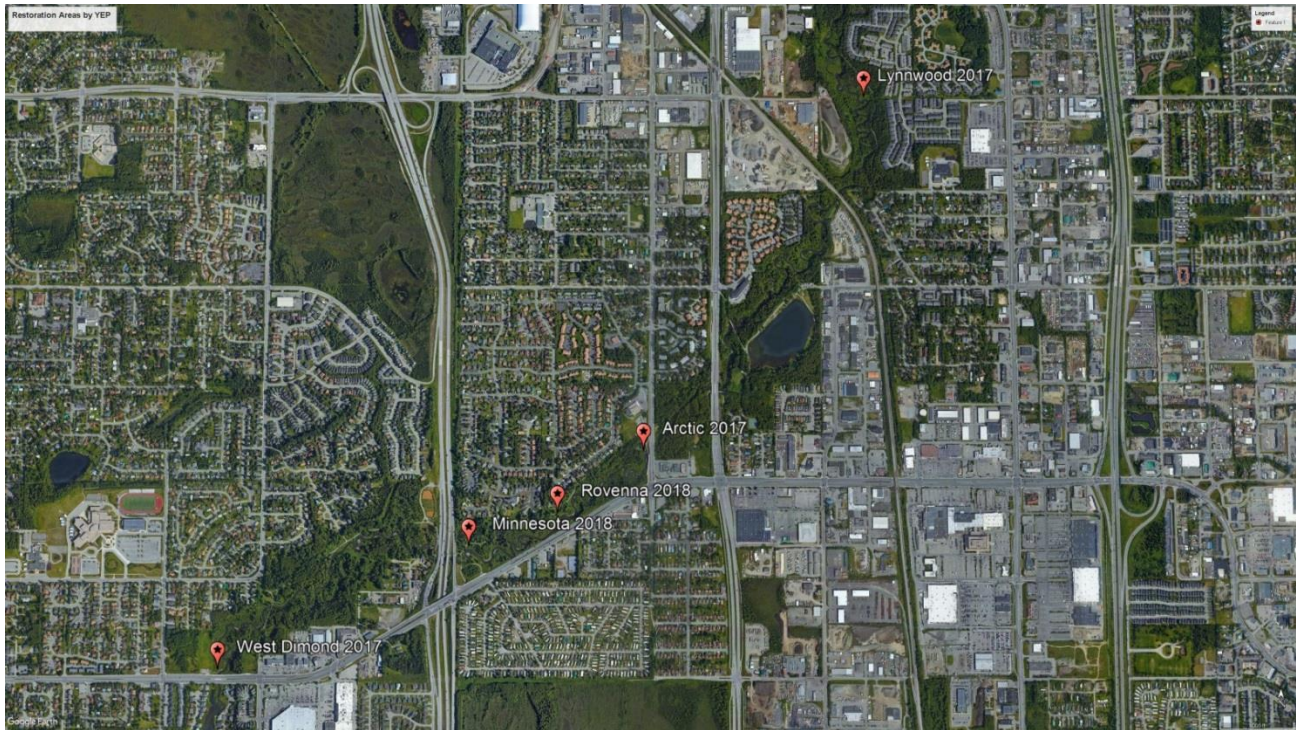
During this meeting, there were also two presentations about current efforts to improve creek bank stabilization and trail improvements. One is a three year project that began in 2017 called “Fish Need a Forest”. It is overseen by the Community Forestry Program under the Division of Forestry in the Alaska Department of Natural Resources (ADNR). Other project partners include the Municipality of Anchorage (MOA), Anchorage Park Foundation (APF), Alaska Department of Fish and Game (ADF&G), Alaska Department of Environmental Conservation (ADEC), and U.S. Fish & Wildlife Service (USFWS). The plan is to remove invasive plants, restore stream banks, and do public education on creek stewardship. The overall area includes seven miles of Campbell Creek between Lake Otis and West Dimond.

As part of the “Fish Need a Forest”⁷ project, the 2017 Youth Employment in Parks (YEP) team replaced an elevated light penetrating (ELP) boardwalk along Campbell Creek at W. Dimond, installed 120’ of brush layering and coir logs, and revegetated the area. At Arctic Blvd. they replaced another ELP boardwalk, installed 100’ of vegetation mat and live willow staking, and revegetated ~1,000 ft² area under the boardwalk where asphalt from the old trail had been removed. Their last project was at Lynnwood Park where they planted over 250 trees and shrubs, installed 35’ of brush layering, coir logs and willow stakes along the streambank, and pulled high priority invasive vegetation (Map 2).

In summer 2018, the YEP team worked at two sites on Campbell Creek: Rovenna and Minnesota (Map 2). During the last two weeks of June they planted 2,000 willow stakes and bundles, 109 spruce saplings, 24 birch saplings, and over 100 different shrubs. They used the willow stakes to reinforce the banks and installed vegetation and rock in draining swales⁸. The work at Minnesota will continue in 2019.

⁷ Alaska Department of Natural Resources. 2017. “Campbell Creek Restoration Grant—Fish Need a Forest” Progress Report.

⁸ Anchorage Park Foundation. 2018. “Campbell Creek Restoration Grant” Progress Report.



Map 2 – Location of YEP restoration areas on Campbell Creek (GoogleEarth 2019)

The second report to the committee was an update on improvements by MOA Parks and Rec along Campbell Creek Trail. Their work spanned from 2016 to 2018. A seven mile area between C St. and West Dimond was evaluated, and 2 miles of the trail were improved over the 3 years.

Following are some suggestions for review put forth by the committee.

- There are several fishing and viewing platforms on Campbell Creek which should be looked at for issues with trash, drinking, etc. AWC has field checked the overlooks at Piper St., Rakof and Shelikof, and Arctic as well as fishing platforms at Folker, Shelikof, Arctic and West Dimond. The fishing platform at the end of Folker in Campbell Park has been a constant problem with inebriates, but MOA Parks and Rec removed it.
- AWC received several reports including photos from their May 23, 2018, Annual Creek Cleanup volunteers that depicted homeless camps and trash. This has been common along Chester Creek, but now seems to have expanded considerably on Campbell Creek which could have an impact on water quality.
- There are concerns about snow being plowed into creeks and setbacks along Campbell Creek. Education on this issue would be helpful.

- There has been icing on Campbell Airstrip Road about .3 miles south of Campbell Airstrip Trailhead. (Coordinates are 61.161076°, -149.758471°) The North Fork Campbell Creek runs to the west of Campbell Airstrip Road at a distance of 75'. This needs to be investigated.
- The channelized areas of Campbell Creek need to be located by comparing older and recent topo maps.
- A review of other structures across Campbell Creek, such as bridges, would be useful to see if channel changes have or might affect their integrity.

3. Discussion

The Campbell Creek watershed is a very important feature in the Municipality. Its amenities include a vast array of recreational opportunities in a beautiful setting. Settlement in the Campbell Creek watershed came decades later than the original townsite at Ship Creek in 1915. There was some development in the Campbell Creek area during the 1960s, but most occurred in the 70s. Much of this was due to the widespread presence of spruce and other bogs as well as marshy areas which impeded building.

Once building did begin, there was, at least, some concern put forth by the U.S. Army Corps of Engineers (USACE) about expanding into these areas. A 1968 report⁹ warned about potential problems with flooding along Campbell Creek as vegetation was removed for development. On a positive note, a 1975 report by USACE¹⁰ noted, “the expansion trend of the Anchorage area is toward Campbell Creek because of favorable topography and accessibility. Portions of the flood plain have been purchased and designated as a greenbelt area for recreational development, such as riding trails, foot paths, [sled] dog racing events, picnic grounds, etc.” (1975:3). While there had been concerns about moving into the floodplain, this was mitigated somewhat by creating an extensive greenbelt and recreation area.

As development occurred though, Campbell Creek’s water quality began to degrade. A 1981 working paper by ADEC reports, “Campbell Creek, below its confluence with Little Campbell Creek, and Campbell Lake at its outlet, experienced chronic levels of fecal coliform contamination. These levels were in violation of Alaska Water Quality Standards (AWQS) for all use purposes at the Campbell Lake outlet and for contact recreation below the confluence with Little Campbell Creek¹¹.” An unfortunate casualty was cancellation of the long-standing “Campbell Creek Classic”—a race of canoes and rafts which drew large crowds every year. Started in 1970, the race was abruptly halted in 1985 due to

⁹ U.S. Army Corps of Engineers. 1968. *Flood Plain Information, Campbell Creek, Anchorage, Alaska*. P. 17.

¹⁰ U.S. Army Corps of Engineers. 1975. *Special Flood Hazard Report: Greater Anchorage Area, Campbell Creek*. P. 3.

¹¹ Alaska Department of Environmental Conservation. 1981. “An Investigation of Surface Water Quality of Four Selected Streams within the Anchorage Urban Area”. P. ii.

seriously compromised water quality. A January 18, 1985, *L.A. Times* article reports, “[a] raft, canoe and kayak race that was a summer tradition for 16 years will be canceled because raw sewage found in the waterway may be hazardous to contestants, organizers said Thursday. Sponsors of the Campbell Creek Classic decided that the creek contains too much untreated sewage to allow persons to splash or swim in the water.”¹²

Finally, the issues of polluted creeks were getting the attention they deserved from local, state, and federal agencies. Anchorage’s Department of Health and Human Services (DHHS), the ADEC, and the U.S. Geological Survey (USGS) began sampling water on a regular basis. Interestingly, a creek sign (Figure 7) from the cover of a 1968 USACE working paper warning that “this stream is unsafe for bathing and other human uses” suggests that the pollution problems were known much earlier.



Figure 7 – Signage on Campbell Creek¹³

Today, recreational use of Campbell Creek continues at a high pace. Rafting, tubing, and kayaking are common as are swimming and wading (primary contact recreation). The “beach” area at Campbell Park is a very popular place for these activities, which can result in ingesting creek water.

¹² *L.A. Times*. 1985. “Alaska Waterway Race Victim of Raw Sewage”. At articles.latimes.com/1985-01-18/news/mn-8760_1_raw-sewage.

¹³ U.S. Army Corps of Engineers. 1968. *Flood Plain Information, Campbell Creek, Anchorage, Alaska*. (Cover)

Anchorage Breaks Heat Record, in Unusually Warm Summer

August 01 2013 11:01 AM EDT · Associated Press



Figure 8 – “Swimming” in Campbell Creek at Campbell Park, 2013¹⁴ (Photo by *Anchorage Daily News*, 2013)

A very recent problem that surfaced during AWC’s May 2018 Annual Creek Cleanup was the proliferation of homeless camps along Campbell Creek¹⁵. Until this year, there were little to no reports of homeless camps. That does not necessarily mean that none were present, however there was a noticeable change in their occurrence by way of several different team reports. Besides the trash at the camps, some areas had human feces at the edge of the creek. This is definitely an important issue that needs to be addressed.

4. Considerations for a Watershed Plan

A watershed plan is not a small undertaking in terms of resources, but the benefits can be many. AWC has been working on various aspects of Campbell Creek for decades. This includes collecting water samples and researching history, land use, and channel changes. Besides our own data from four sites between 1999 and 2015, there are sources for additional water quality data. The Campbell Creek TMDL lists 12 sites with USGS data, 17 sites monitored by the MOA, and 8 by ADEC. The time span is from 1980 to 2005. And, with ample governmental reports by different local, state, and federal agencies, there is no shortage of information to produce a good plan.

Other positive considerations are the more recent settlement of the Campbell Creek watershed; the

¹⁴ At weather.com/news/news/anchorage-breaks-heat-record-unusually-warm-summer-20130731.

¹⁵ Homeless camps have been reported along Chester Creek for several years, but this is the first time that a noticeable presence of camps along Campbell Creek was reported.

fact that there was some forethought put into flood control during development; and it has become and continues to be a very popular and well-used creek. These factors may make its removal from the impaired waters list more likely than other creeks, such as Chester Creek.

5. Next Steps

Preliminary work on the Campbell Creek watershed has provided some good areas to begin focusing on. With that being said, the tasks for scoping are as follows:

1. Expand stakeholders
 - a. Other agencies and departments
 - i. MOA Parks and Rec
 - ii. MOA Planning Department
 - iii. MOA Homeless Coordinator
 - iv. AKDNR, e.g. Division of Forestry
 - v. Alaska Department of Transportation and Public Facilities (AKDOT&PF)
 - vi. Bureau of Land Management (BLM)
 - vii. U.S. Army Corps of Engineers (USACE)
 - b. Other organizations
 - i. Alaska Botanical Garden
 - ii. Anchorage School District
 - iii. BLM Campbell Creek Science Center
 - iv. Anchorage Park Foundation
 - v. Alaska Sled Dog Racing Association
 - vi. Friends of Anchorage Coastal Refuge
 - c. Interest groups
 - i. Community Councils
 - ii. Campbell Lake Homeowners
 - iii. Greatland Trust
 - iv. Recreational and Environmental Groups
 1. Knik Canoers and Kayakers
 2. Trout Unlimited
 3. Anchorage Meetup (they have adopted Campbell Creek at Campbell Park)
 4. Anchorage Trail Watch and other bike groups
 - d. Residents and businesses along the creek
2. Hold public meetings to elicit issues of concern on:
 - a. Habitat—terrestrial and aquatic
 - b. Fish and wildlife
 - c. Water quality

- d. Water quantity
 - e. Recreation opportunities
3. Refine issues of concern:
 - a. Look for causes
 - b. Set goals
 - c. Define indicators for amelioration
4. Bring stakeholders together for planning
5. Organize field trips to review the creek and concerns

From this point, the process of creating the watershed plan would essentially be the same as that for Chester Creek (2014)—a series of meetings to refine the draft plan. Given the overall value of Campbell Creek to the community as well as visitors, it would be a positive action to prepare a watershed plan. As far as a timeline, 2019 should be used to recruit a larger group of interested parties in order to begin defining the issues and concerns as well as positive aspects. This would be through a focus group format. Once that is accomplished, the working group could begin formulating the plan and action items.

AWC believes there is sufficient interest in the Campbell Creek watershed as well as numerous benefits to be gained by preparing a watershed plan, and recommends that the process continue through a full scoping between now and 2020.

Bibliography

Alaska Department of Environmental Conservation. 2006. "Total Maximum Daily Loads (TMDLs) for Fecal Coliform Bacteria in the Waters of Campbell Creek and Campbell Lake in Anchorage, Alaska". At [dec.alaska.gov/Water/tmdl/pdfs/campbellcreek and lake final TMDL.pdf](http://dec.alaska.gov/Water/tmdl/pdfs/campbellcreek%20and%20lake%20final%20TMDL.pdf).

Alaska Department of Environmental Conservation. 2015. "Anchorage Municipal Separate Storm Sewer System Individual Permit – Final Permit". At [anchoragestormwater.com/Documents/apdes/AKS052558 MOA MS4 2015 FP.pdf](http://anchoragestormwater.com/Documents/apdes/AKS052558%20MOA%20MS4%202015%20FP.pdf).

Alaska Department of Fish and Game. Fish Passage Improvement Program (FPIP)-New Mapper. At adfg.maps.arcgis.com/apps/webappviewer/index.html?id=f5aac9a8e4bb4bf49dc39db33f950bbd.

Alaska Department of Fish and Game. Fish Passage Improvement Program (FPIP)-Old Mapper. At adfg.alaska.gov/index.cfm?adfg=fishpassage.database.

Alaska Department of Fish and Game. Fish Passage Site 20401812. At adfg.alaska.gov/sf/reports/FishPassage/rptSite.cfm?site=20401812.

Alaska Department of Fish and Game, Special Publication No. 14-08. 2014. Eisenman, M., and G. O'Doherty. "Culvert inventory and assessment for fish passage in the State of Alaska: A guide to the procedures and techniques used to inventory and assess stream crossings 2009-2014". At adfg.alaska.gov/FedAidPDFs/SP14-08.pdf.

L.A. Times. 1985. "Alaska Waterway Race Victim of Raw Sewage". At [articles.latimes.com/1985-01-18/news/mn-8760_1 raw-sewage](http://articles.latimes.com/1985-01-18/news/mn-8760_1_raw-sewage).

Municipality of Anchorage. 2014. *Chester Creek Watershed Plan*. At anchoragestormwater.com/Documents/ChCrkWshdPln062015.pdf.

The Weather Channel. 2013. "Anchorage Breaks Heat Record, in Unusually Warm Summer. At weather.com/news/news/anchorage-breaks-heat-record-unusually-warm-summer-20130731.

U.S. Army Corps of Engineers. 1968. *Flood Plain Information, Campbell Creek, Anchorage, Alaska*.

U.S. Army Corps of Engineers. 1975. *Special Flood Hazard Report: Greater Anchorage Area, Campbell Creek*.

Chester Creek Watershed Plan (2014)

Action Items Update

By Anchorage Waterways Council

February 1, 2019

6. Appendix

I. RESTORATION PRIORITIES FOR CHESTER CREEK WATERSHED¹

The following table (Table.6.1.) is divided into five drainage areas that begin at the mouth of Chester Creek and can be located on the accompanying map (Figure 6.1):

C = All Chester Watershed Drainages
CW = Westchester/Eastchester Drainage
CMF = Middle Fork Chester Drainage
CSF = South Fork Chester Drainage
CRL = Chester Reflection Lake Drainage
CNF = North Fork Chester Drainage

The 7 goals from the watershed plan are listed for each action item in the drainage. The actions are listed in geographic order for the most part.

Goal 1 – WATER QUALITY: Meet State standards for water quality in Chester Creek.

Goal 2 – WATER QUANTITY: Return Chester Creek to a more natural hydrologic regime.

Goal 3 – WILDLIFE HABITAT: Provide habitat for a diversity of wildlife along Chester Creek.

Goal 4 – FISH HABITAT: Provide for healthy fish and other aquatic organism populations in Chester Creek.

Goal 5 – SOCIAL and ECONOMIC OPPORTUNITIES: Foster a high degree of social and economic opportunities.

Goal 6 – COMMUNICATION and COORDINATION: To have a highly involved and dedicated community and Municipality in maintaining the health of Chester Creek.

Goal 7 – DATA ACQUISITION: Improve our understanding of the watershed.

“Lead” refers to the most likely agency or organization to work on the project.

ADF&G – Alaska Department of Fish and Game
AKDOT – Alaska Department of Transportation and Public Facilities
APF – Anchorage Park Foundation
APU – Alaska Pacific University
AWC – Anchorage Waterways Council
Coop Ext – UAF Cooperative Extension
DPW – MOA Department of Public Works

¹ This list was created from by recommendations from the “Watershed Planning in the Municipality of Anchorage” group, which met between 2010 and 2012.

GLT – Great Land Trust
HLB – MOA Heritage Land Bank
MOA – Municipality of Anchorage (Department of Public Works and/or Street Maintenance)
P&R – MOA Parks and Recreation
USFWS – U.S. Fish and Wildlife Service
WMS – MOA Watershed Management Services

“Cost” is an estimate range based on 2014 figures.

- 1 - \$0-\$10,000
- 2 - \$10,001-\$50,000
- 3 - \$50,001-\$100,000
- 4 - \$100,001-\$250,000
- 5 - \$250,001-\$500,000
- 6 - >\$500,000

“Priority” is a suggested value.

- 1 – Highest
- 2 – Medium
- 3– Lowest

“Mandate” is where the action’s need most likely originates.

ADEC WQS – Alaska Department of Environmental Conservation Water Quality Standards
ADF&G – Alaska Department of Fish and Game, Habitat Division
APDES – Alaska Pollutant Discharge Elimination System Permit
Comp Plan – Anchorage 2020 Comprehensive Plan
Title 21 – Anchorage’s Municipal Land Use Laws

Funding for projects will be sought from a variety of sources:
Municipal CIP (Capital Improvement Program) and Grants

Figure 6.1. Restoration Priority Locations for Chester Creek Watershed

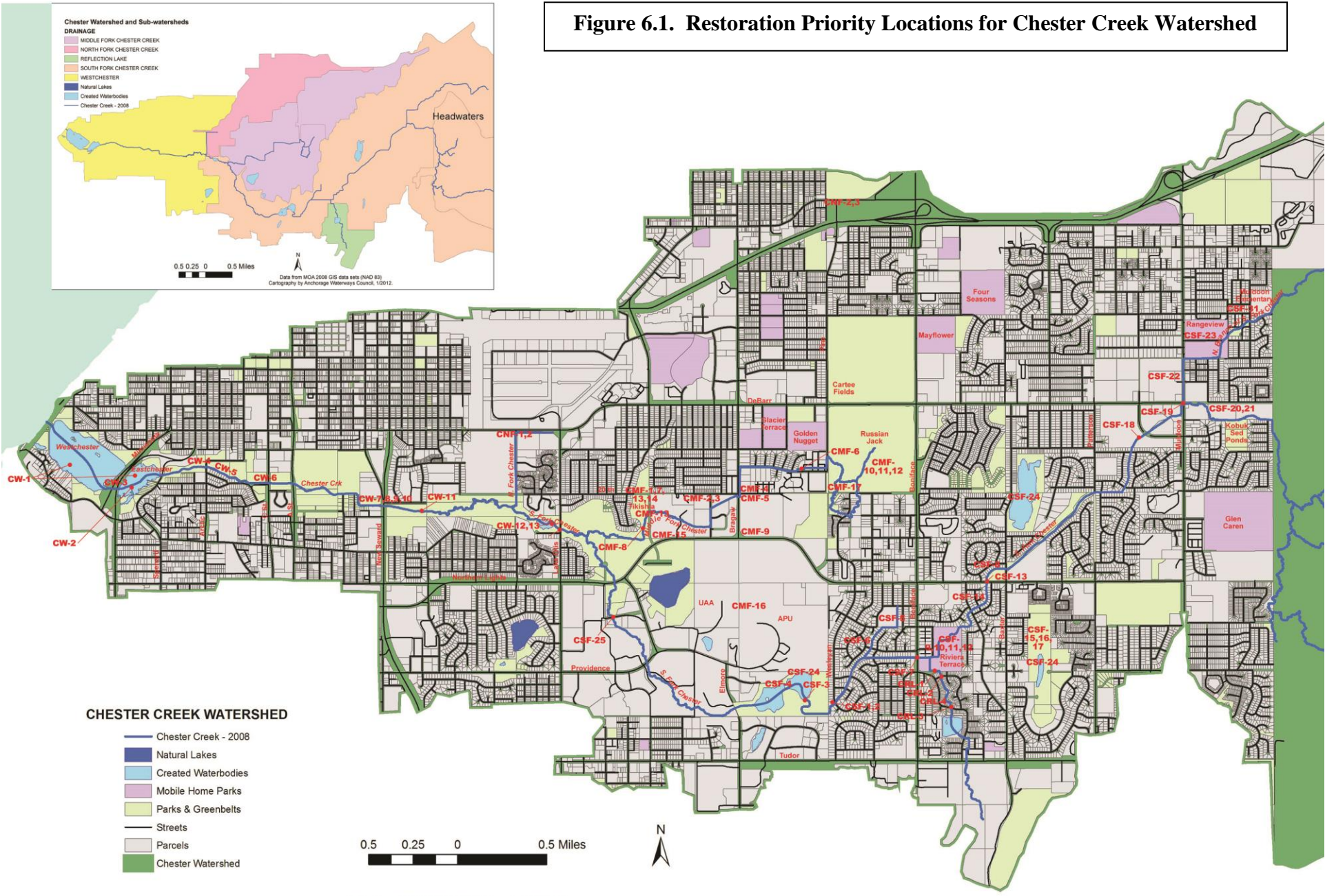


Table 6.1. Restoration Priorities Shown on Map

ALL CHESTER WATERSHED DRAINAGES (C)

Map ID	Goal(s)	Lat/Long	Approximate Location	Issue	Action Item	Lead	Cost	Priority	Mandate
C-1	2,3,4,6,7	N/A			Conduct update to flood mapping for watershed. 2018 UPDATE: The MOA WMS has created an interactive map for floodplain mapping at http://moapw.maps.arcgis.com/apps/Viewer/index.html?appid=1687cdfa5f1e499d985e734dff9cc72f	WMS	Varies	1	Title 21
C-2	1,2,3,4,5,6,7	N/A			Create and implement invasive removal and control strategy for Bird Cherry, Purple Loosestrife and Reed Canarygrass.	P&R, WMS, APF, Coop Ext	3	1	Title 21
C-3	1,3,4,5,6	N/A			Work with MOA Parks Dept and landowners to keep vegetation buffer between lawns and stream banks.	P&R	2	2	APDES, Title 21
C-4	1,2,3,4,5,6,7	N/A			Implement an LID/OGS strategy watershed-wide.	WMS	5	1	APDES
C-5	3,4,5,6,7	N/A			Conduct salmon monitoring on a yearly basis.	ADF&G, APU	1	2	ADF&G
C-6	1,3,4,5,6	N/A			Place signs at all creek crossings identifying creek. 2018 UPDATE: AWC has prepared a report on creek signage. It follows this update.	WMS	2	2	APDES, Comp Plan
C-7	1,2,3,4,5	N/A			Protect privately-owned wetlands throughout drainage.	HLB, GLT	Varies	1	APDES, Comp Plan
C-8	1,3,4,5,6	N/A			Create interactive walking tours of greenbelt.	AWC	2	3	APDES
C-9	1,3,4,5,6	N/A	Ambergate St. between N. Lights and Campbell Airstrip		Conduct educational campaign on tossing household/greenhouse plants into the creek and riparian area. 2017 UPDATE: AWC letter to residents 6/12/17	AWC	1	1	Title 21
C-10	2,4	N/A			Identify low flow conditions for fish habitat.	WMS, APU, ADF&G	2	1	Comp Plan

WESTCHESTER/EASTCHESTER AREA (CW)

Map ID	Goal(s)	Lat/Long	Approximate Location	Issue	Action Item	Lead	Cost	Priority	Mandate
CW-1	1,2,3,4,5,6,7	N/A	Westchester & Eastchester		Control Reed Canarygrass, Purple Loosestrife and other invasives around Westchester and Eastchester Lagoons	P&R, WMS, APF, Coop Ext	2	1	Title 21
CW-2	1,2,3,4	N/A	Eastchester	Sediment has accumulated, filling in old channel as a natural process.	Active street sediment source removal in stormwater system to reduce rate of accumulation by reducing sediment input by streets upstream. 2016 UPDATE: Status according to AKDOT's Eric Miyashiro, 11/4/16, DOT&PF has instituted a sweeping program that sweeps the streets to remove sediment and keep it from entering water systems. Also there is a storm drain cleaning program that cleans the sediment, debris and pollutants from the storm drain systems. This keeps the system functioning properly and keeps sediment and contaminants out of waterways.	DPW, AKDOT	Varies	1	APDES, Title 21
CW-3	1,2,3,4,5,6	61.2, -149.89	Arctic Blvd.	Boulders backwater culvert and upstream creek, increasing sediment deposition and eroding banks. Culvert backwaters local area during 100-year flood event. ADF&G 20400056 culvert green.	Model culvert to review capacity, impact to homeowners for flooding concerns and fish passage. Replace Arctic Blvd. culvert top pass 100 year flood and minimize backwater effects to homeowners, remove or retrofit rocks to decrease sedimentation and backwater through area. Partially completed. This culvert # is incorrect. It is ADF&G 2040031. For ADF&G 20400056—see CSF-6.	MOA	6	1	Title 21
CW-4	1,3,4,5,6,7	N/A	Valley of the Moon Park along creek and bike trail	High use by public causing extensive streambank trampling and erosion.	Area was revegetated in 2013 and access stairs were placed to direct people and pets to creek in specific locations. Monitor progress. Area reviewed on 10/3/17. Stairs need repair, people still using and trampling long stretches of bank on park (west) side. 2017 UPDATE: See 2017 report.	P&R	1	2	Title 21

Map ID	Goal(s)	Lat/Long	Approximate Location	Issue	Action Item	Lead	Cost	Priority	Mandate
CW-5	1,3,4,5,6	N/A	Valley of the Moon Park along Chester Creek	Rock lined banks and lawn to water's edge of houses along south side of bike path and creek	Work with property owners to remove rocks and install more diverse habitat through bioengineering techniques and create a vegetated buffer of riparian vegetation between creek and lawn. Area reviewed on 10/3/17. Yard furniture and some lawn/yard areas remain unvegetated. 2017 UPDATE: See 2017 report.	P&R, WMS	1	2	APDES, Title 21
CW-6	1,2,4,5,7	61.2, -149.88	C Street Bridge	Channel widened to accommodate construction, local slope may have been reduced, increasing sediment deposition rates.	Evaluate current condition and produce a feasibility study of potential options to consider the magnitude of the problem and to increase sediment transport and habitat features as well as riparian vegetation. 2016 UPDATE: Status according to AKDOT's Eric Miyashiro, 11/4/16, is the channel at the bridge appears to be similar to the upstream and downstream channel. DOT&PF only has jurisdiction within its right-of-way. Beyond that is the MOA's responsibility.	AKDOT	5	2	APDES, Comp Plan
CW-7	1,2,6,7	N/A	Seward Highway	Untreated stormwater from a 42-inch diameter storm drain southwest corner of crossing.	Evaluate AKDOT record drawings showing a petroleum separator in first manhole from outfall and it if is in service. Evaluate potential to connect part of storm network to other storm drains, reducing flows. 2016 UPDATE: Status according to AKDOT's Eric Miyashiro, 11/4/16, is that the culvert crossing met the design standards in place at the time of construction. DOT&PF will replace the culvert when the Seward Highway requires major reconstruction in this area. It is not known when this will be needed.	AKDOT	1	1	APDES
CW-8	1,4	N/A	Seward Highway	Untreated stormwater from a 42-inch diameter storm drain southwest corner of crossing.	Construct stormwater treatment area at Chester Creek at Eagle Street and connect with 1300 feet of storm drain. 2016 UPDATE: Status according to AKDOT's Eric Miyashiro, 11/4/16, is that the culvert crossing met the design standards in place at the time of construction. DOT&PF will replace the culvert when the Seward Highway requires major reconstruction in this area. Date unknown.	AKDOT	2	1	APDES

Map ID	Goal(s)	Lat/Long	Approximate Location	Issue	Action Item	Lead	Cost	Priority	Mandate
CW-9	2	N/A	Creek downstream of Seward Highway	High velocities from culvert during floods erode streambanks, banks are too steep, gabions eroding into creek, river left bank too steep for vegetation establishment, storm drain flow erodes creek/banks.	Remove/reinforce gabions - install root wads on both sides of creek revegetate, install boulder erosion protection to dissipate energy from storm water flows from storm drain outlet. 2016 UPDATE: Status according to AKDOT's Eric Miyashiro, 11/4/16, is that the problem extends beyond the DOT&PF ROW. The gabion baskets appear to be part of the private parking lot located on the south side of the creek. This is an MOA issue.	AKDOT	5	2	APDES
CW-10	2,3,4,5	61.2, -149.86	Seward Highway	ADF&G 20400033 fish passage issue. Culvert too small, constricted, debris and fish barrier, ice jacking compromised upstream 20-25 feet of culvert.	Replace Seward Highway culvert with bridge for fish, animal and pedestrian passage 2016 UPDATE: May be a custom pipe. The culvert crossing met the design standards in place at the time of construction. DOT&PF will replace the culvert when the Seward Highway requires major reconstruction in this area. It is not known when this will be needed.	AKDOT	6	2	Title 21
CW-11	1,3,4	N/A	Karluk Street Bike Trail Bridge	An exposed telephone cable is causing the creek to erode the channel banks.	Work with utility to bury utility line below streambed. 2016 UPDATE: Field work 8/27/16 showed the utility line is no longer in streambed.	Utility	1	1	ADF&G
CW-12	1,2,3,4	61.2, -149.84	Hillstrand Pond	ADF&G 20400035 fish passage issue. Perch and velocity issues at culvert outlets.	Replace Hillstrand Pond culverts with bridge, weir and rocky riffle 2018 UPDATE: Culvert still coded red on 1/25/19.	MOA	3	2	ADF&G
CW-13	1,3	N/A	Hillstrand Pond	Stormwater pipe from Cliffside Drive is not treated prior to discharge to creek near Hillstrand Pond	Install end-of-pipe controls at Cliffside Drive	DPW	2	1	APDES

Map ID	Goal(s)	Lat/Long	Approximate Location	Issue	Action Item	Lead	Cost	Priority	Mandate
CW-14	4	61.19, -149.83	Lake Otis Parkway	ADF&G 20400036 fish passage issue. Velocity and perch issues at culvert outlet	Replace culvert and wood fish ladder with bridge or large, embedded pipe. 2016 UPDATE: Per Eric Miyashiro, 11/4/16, this is a MOA maintained road. 2018 UPDATE: Culvert still coded red on 1/25/19.	MOA, AKDOT	3	2	ADF&G
CW-15	1	61.19, -149.83	Lake Otis Parkway	Runoff from road is not treated prior to discharge to creek.	Install pretreatment basin for Lake Otis runoff.	DPW	4	1	APDES

MIDDLE FORK CHESTER (CMF)

Map ID	Goal(s)	Lat/Long	Approximate Location	Issue	Action Item	Lead	Cost	Priority	Mandate
CMF-1	2,4	N/A	Middle Fork at Tikishla Park	Channel widening and habitat loss from utility work at ditch confluence	Reconstruct creek and ditch banks to increase depth and available habitat.	WMS	5	2	ADF&G
CMF-2	2,4	N/A	Middle Fork at Nichols Street	Middle Fork was culverted in this area during development for about 500 feet.	Construct an open channel. Channel would have one road and two driveway crossings with steep, deep sides.	ADF&G	6	2	ADF&G
CMF-3	2,4,7	61.2, -149.81	Middle Fork at Nichols Street	ADF&G 20400038 fish passage issue for slope.	Evaluate and replace culvert. 2018 UPDATE: <i>Culvert still coded red on 12/28/18.</i>	MOA	3	2	ADF&G
CMF-4	1,4	61.2, -149.8	Middle Fork at Bragaw Street	Untreated stormwater input	Construct a water treatment pond to improve water quality prior to discharge from approximately 1800 acres, including Russian Jack Springs which is located in an area bounded by Bragaw, Northern Lights and Nichols Street. 2016 UPDATE: <i>Status according to AKDOT's Eric Miyashiro, 11/4/16, if there are water quality issues they are probably associated with routing the stream through Reka Drive with its adjacent development. The MOA would be the lead if a water treatment pond is needed.</i>	AKDOT	5	1	APDES
CMF-5	2,4	61.2, -149.8	Middle Fork at Bragaw Street	ADF&G 20400039 culvert fish passage issues at culvert, maintenance of culvert and stormwater piping of stream upstream.	Replace culvert for fish passage and hydraulic conductivity as a maintenance issue for flows. 2018 UPDATE: <i>Culvert coded black on 12/28/18.</i>	MOA	3	2	ADF&G

Map ID	Goal(s)	Lat/Long	Approximate Location	Issue	Action Item	Lead	Cost	Priority	Mandate
CMF-6	2,4,6	61.2, -149.79	Middle Fork at Reka Street	ADF&G 20400043 fish passage issue and upstream driveway culverts small, banks mowed to edge, lack of habitat.	This area is cut off from rest of creek by 2400 feet of storm drain. Perform study of fish use, enlarge pipes, add riparian vegetation and instream logs and boulders for habitat diversity, replace fish passage issue at culvert. 2018 UPDATE: Culvert still coded red on 12/28/18.	MOA	5	2	ADF&G
CMF-7	1,2	N/A	Middle Fork at Tikishla Park	Floodplain disconnect and untreated stormwater flows.	Install pretreatment facilities and reconnect flows to adjacent lowlands in Tikishla Park.	DPW	5	1	APDES
CMF-8	1	N/A	Middle Fork at Alder Drive	Untreated stormwater flows.	Install end-of-pipe pretreatment at Alder Drive.	DPW	4	1	APDES
CMF-9	1,2,5	N/A	Middle Fork near East High School	Untreated stormwater flows.	Disconnect storm drains near East High School and Wesleyan to natural wetlands.	DPW	4	1	APDES, Comp Plan
CMF-10	1,2,5	N/A	Middle Fork near Russian Jack Park	Protection of wetlands for stormwater buffer	Protect uplands and wetlands north of Northern Lights and west of Wesleyan Drive.	HLB, GLT	5	2	Comp Plan
CMF-11	1,2,5	N/A	Middle Fork near Russian Jack Park	Protection of wetlands for stormwater buffer	Protect privately owned wetlands near Russian Jack Park.	HLB, GLT	4	2	Comp Plan
CMF-12	1	N/A	Middle Fork headwaters above Russian Jack Park	Untreated stormwater flows.	Construct LID at Glacier, Mayflower and Four Seasons mobile home parks.	WMS	5	1	APDES
CMF-13	1	N/A	Middle Fork at Tikishla Park	Middle Fork runs orange and highly turbid during rain events and springmelt.	Create a report that evaluates the history, conditions and feasibility of various options to decrease the amount of turbidity caused by groundwater input into the local stormwater system and creek. Implement suggestions.	WMS	1	1	APDES

Map ID	Goal(s)	Lat/Long	Approximate Location	Issue	Action Item	Lead	Cost	Priority	Mandate
CMF-14	4	N/A	Middle Fork/drainage tributary	Fish Passage is blocked under trail - no ADF&G name or location in database.	Lower culvert or replace with larger, embedded pipe.	ADF&G, P&R	3	2	ADF&G
CMF-15	4	61.19, -149.82	Northern Lights Blvd.	ADF&G Culvert 20400047 fish passage issue as constriction/velocity	Replace with a larger, embedded culvert. 2018 UPDATE: <i>Culvert location still coded gray on 12/28/18.</i>	MOA	3	2	ADF&G
CMF-16	1	N/A	Middle Fork at University Area	Untreated stormwater flows.	Install end-of-pipe pretreatments at UAA and APU.	DPW	2	1	APDES
CMF-17	1		Middle Fork at Pine Street	Untreated stormwater flows.	Disconnect Pine Street outfall that drains to Cartee Softball Fields.	DPW	2	1	APDES

SOUTH FORK CHESTER (CSF)

Map ID	Goal(s)	Lat/Long	Approximate Location	Issue	Action Item	Lead	Cost	Priority	Mandate
CSF-1	4	N/A	South Fork - University Lake and Wesleyan Drive	Creek is over-widened and straight with little habitat diversity as it is a rerouted section of creek to fill University Lake	Increase habitat diversity in stream between University Lake and Wesleyan Drive, potentially add bankfull banks to bring to a more representative cross-section area for riffles, add boulders for scour pools. This area has the potential to re-create meanders for the creek and a floodplain in undeveloped area to the north of creek.	USFWS	5	2	ADF&G
CSF-2	1,2,4	N/A	South Fork - University Lake and Wesleyan Dr.	To keep the potential for remeandering creek in this area.	Protect uplands and wetlands north of Northern Lights and west of Wesleyan Drive	HLB, GLT	4	2	Comp Plan
CSF-3	1,3	N/A	South Fork at inlet to University Lake	Low flow issues over sediment delta at creek inlet to lake, potentially exacerbated when Chester was rerouted into the lake, causing significant erosion upstream.	Remove sediment from inlet, create sediment trap to capture estimated additional sediment from further bank erosion, narrow creek mouth downstream of bridge, consider habitat diversification in eroded section of channel.	P&R	5	2	APDES
CSF-4	1,3	N/A	South Fork at University Lake	Dog park introduction of fecal coliform into lake and trampling of lakeshore is high.	Create directed access to lake and maintain vegetated buffer outside of access areas, restore vegetated buffer in impacted locations. 2018 UPDATE: <i>Still a problem as dogs access the lake in various places. Photos included. MOA University Lake Master Plan proceeding which may improve.</i>	P&R	3	1	APDES

CSF-5	1,2,3,4	N/A	South Fork at College Gate Elementary	Channel is overwidened with a gabion wall along the west bank. Slope grade causes severe icing and backwatering.	Replace gabion with bioengineering and replant riparian vegetation, potential to create wetland marsh while narrowing channel or regrade stream to eliminate backwater and create habitat diversity riffles and pools.	USFWS	5	1	Comp Plan
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Map ID	Goal(s)	Lat/Long	Approximate Location	Issue	Action Item	Lead	Cost	Priority	Mandate
CSF-6	4	61.18, -149.78	South Fork at Emmanuel Street	ADF&G 20400056 fish passage issue - set at wrong grade creating a velocity chute at inlet of culvert.	Evaluate flows, at minimum remove mitered end of culvert and restore site unless flow calculations indicate complete replacement for hydraulic capacity. 2016 UPDATE: Status according to AKDOT's Eric Miyashiro, 11/4/16, is that this is a MOA maintained road. 2018 UPDATE: Culvert is still shown red as of 12/28/18. On a tributary to South Fork Chester.	AKDOT	3	1	ADF&G
CSF-7	4	61.18, -149.77	South Fork at Boniface	ADF&G 20400063 fish passage issue. Gradient grey, constriction ration grey, rock weir at inlet increase velocities.	Evaluate fish passage flows for crossing, take out rock weir (looks to be fallen rock from riprap sides) and replace. Evaluate large opening for large animal passage under Boniface. 2016 UPDATE: Status according to AKDOT's Eric Miyashiro, 11/4/16, the culvert met the design standards in place at the time of construction. DOT&PF will replace the culvert when Boniface requires major reconstruction. It is not known when this will be needed. 2018 UPDATE: Culvert is still shown gray as of 12/28/18.	AKDOT, ADF&G	3	1	ADF&G
CSF-8	1	N/A	South Fork Boniface & Beaver	Untreated stormwater flows.	Install End of pipe controls in Nunaka Valley	DPW	2	1	APDES
CSF-9	4	61.18, -149.77	South Fork at Riviera Terrace Trailer Park - Lee Street	ADF&G 20400057 fish passage issue. Gradient & constriction issues for double pipe & velocity gradient, backwaters a large length of creek.	Evaluate for fish passage flows and replace pipe with one large pipe to comply with MOA Standard Design Criteria and ADF&G fish passage for embedded pipes, slope so no backwater of creek upstream. 2018 UPDATE: Culvert is still shown gray as of 12/28/18.	Private	3	1	ADF&G

Map ID	Goal(s)	Lat/Long	Approximate Location	Issue	Action Item	Lead	Cost	Priority	Mandate
CSF-10	4	61.19, -149.77	South Fork at Riviera Terrace Trailer Court - Sylvia Drive	ADF&G 20400058 fish passage issues. Perch, velocity issues. Triple culvert does not conform to MOA design criteria.	Replace with a larger, embedded culvert. 2018 UPDATE: Culvert is still shown red as of 12/28/18	Private	3	1	ADF&G

Map ID	Goal(s)	Lat/Long	Approximate Location	Issue	Action Item	Lead	Cost	Priority	Mandate
CSF-11	4	61.19, -149.77	South Fork at Riviera Terrace Trailer Court - Sylvia Drive	ADF&G 20400060 fish passage issues. Velocity issues & triple culvert does not conform to MOA design criteria.	Replace with a larger, embedded culvert. 2018 UPDATE: Culvert is still shown red as of 12/28/18.	Private	3	1	ADF&G
CSF-12	1,6	N/A	South Fork at Riviera Terrace Trailer Court	Debris in creek and riparian areas, general encroachment into buffer zone and backwater issues due to culverts or rock weirs at culverts.	Clean up area, education outreach needed, removal of rock weirs put there by locals, improve tossing of house plants into creek.	AWC	1	2	APDES
CSF-13	4	61.19, -149.76	South Fork at Northern Lights Blvd.	ADF&G 20400064 fish passage issue. Obstructions in pipe, barrier potential at outlet.	Clean obstructions and outlet barrier, evaluate for hydraulic and fish passage criteria, replace if necessary. 2018 UPDATE: Culvert is still shown red as of 12/28/18.	MOA	3	1	ADF&G
CSF-14	6,7	N/A	South Fork along Ambergate	General erosion along fences, lawns, issues with tree cutting.	Walk creek to evaluate extent of issues, form an approach to address erosion, educate local homeowners on value of riparian area.	AWC	1	2	Title 21
CSF-15	1	N/A	South Fork at Baxter Road	Untreated storm water runoff	Detention and treatment at discharge of basin Baxter Road and Northern Lights.	DPW	3	1	APDES
CSF-16	1	N/A	South Fork at Baxter Bog	Untreated storm water runoff	Sediment removal and hydraulic dampening all basins into Baxter Bog.	DPW, P&R	3	1	APDES
CSF-17	1,2,5	N/A	South Fork at Baxter Bog	Drying of Baxter Bog wetlands	Reconnect storm water flow to Baxter Bog.	DPW, P&R	3	1	APDES Comp Plan

Map ID	Goal(s)	Lat/Long	Approximate Location	Issue	Action Item	Lead	Cost	Priority	Mandate
CSF-17	1,2,5	N/A	South Fork at Baxter Bog	Drying of Baxter Bog wetlands	Reconnect storm water flow to Baxter Bog.	DPW, P&R	3	1	APDES Comp Plan
CSF-18	4	N/A	South Fork at Begich Middle School	Invasives, rock weir formation by children to cross stream	Perform invasive removal and design/construct small bridges for children to cross creek.	AWC	1	3	Title21, ADF&G
CSF-19	4	61.2, -149.73	South Fork at Muldoon Road	ADF&G 20400249 fish passage issue. Gradient in culvert makes perch and velocity barrier, long-term maintenance issue for hydraulics, does not pass 100-year flood well, backwaters upstream businesses.	Replace culvert, evaluate current (2012) design to move creek to new location and crossing under Muldoon road. 2016 UPDATE: Completed per Bill Spencer, HDR, 7/25/16. 2017 UPDATE: See 2017 report.	MOA, AKDOT	6	1	ADF&G
CSF-20	3,4	N/A	South Fork upstream of Muldoon Road	Creek is modified with low habitat diversity and at-risk of road and development.	Create more natural creek on South Fork east of Muldoon Road. Align to Hill with a 100 foot corridor. 2016 UPDATE: Completed per Bill Spencer, HDR, 7/25/16. 2017 UPDATE: See 2017 report.	DPW	5	2	ADF&G
CSF-21	1	N/A	South Fork upstream of Muldoon Road	Creek has significant debris in it up to halfway to military land	Take debris out of creek. 2016 UPDATE: This is ongoing per Bill Spencer, HDR, as of 7/25/16.	AWC	1	1	APDES
CSF-22	4	N/A	North Fork of the South Fork Muldoon Road	Creek is culverted under Muldoon Road for 1,500 feet	Remove North Branch of South Fork from Muldoon Road and put into open channel in a 100 foot ROW. 2016 UPDATE: Not accomplished 7/25/16 per Bill Spencer, HDR.	DPW	2	2	ADF&G
CSF-23	6	N/A	North Fork of South Fork at Rangeview Trailer Ct.	Encroachment & debris issues in the creek, dog use, & bank trampling.	Remove debris, install access points, revegetate other access points.	Private	1	3	APDES

Map ID	Goal(s)	Lat/Long	Approximate Location	Issue	Action Item	Lead	Cost	Priority	Mandate
CSF-24	6	N/A	South Fork at lakes and bogs	No education signage for public.	Install kiosks at University Lake, Baxter Bog, Cheney Lake.	AWC	1	3	APDES
CSF-25	4	61.192, -149.829	Mallard Drive	ADF&G Culvert 20400250 fish passage issue as a constriction to creek	2018 UPDATE: ADF&G reports it was replaced with a larger, embedded culvert. Still shown as red for fish passage on 12/28/18, in ADF&G mapper. Needs to be field checked after breakup in 2019.	MOA	3	2	ADF&G
CSF-26	1,4	N/A	U-Med District	Evaluate cumulative effects of water temperature from building inputs	Monitor creek above, below and in selected areas where buildings are discharging HVAC water.	AWC	1	1	ADEC WQS

CHESTER REFLECTION LAKE (CRL)

Map ID	Goal(s)	Lat/Long	Approximate Location	Issue	Action Item	Lead	Cost	Priority	Mandate
CRL-1	4	61.18, -149.77	Reflection Lake at Sapien Ave.	ADF&G 20400212 fish passage issue. Perch and gradient issues.	Replace with a larger, embedded culvert. Completed (J. Urbanus 12/10/14) 2018 UPDATE: Still shown as black on map as of 1/25/19. Note that culvert was replaced in 2012, needs to be resurveyed by ADF&G.	MOA	3	2	ADF&G
CRL-2	4	61.18, -149.77	Reflection Lake at Image Drive	ADF&G 20400214 fish passage issue. Gradient, constriction and velocity issues.	Replace with a larger, embedded culvert. Completed (J. Urbanus 12/10/14). 2018 UPDATE: Still shown as black on map as of 1/25/19. Note that culvert was replaced in 2012, needs to be resurveyed by ADF&G.	MOA	3	2	ADF&G
CRL-3	4	61.18, -149.77	Reflection Lake at Reflection Drive	ADF&G 20400215 fish passage issue and flow capacity. Gradient, velocity.	Replace with a larger, embedded culvert and investigate outlet of Reflection Lake for open channel if necessary. Completed (J. Urbanus 12/10/14) 2018 UPDATE: Still shown as black on map as of 1/25/19. Note that culvert was replaced in 2012, needs to be resurveyed by ADF&G.	MOA	3	2	ADF&G
CRL-4	2,3,4	N/A	Reflection Lake between Image and Reflection Drive	Area could be made into a wetland marsh to enhance habitat.	Image Drive and Reflection Drive area turn greenbelt to marshy profile for creek.	MOA	4	3	Comp Plan

NORTH FORK CHESTER (CNF)

Map ID	Goal(s)	Lat/Long	Approximate Location	Issue	Action Item	Lead	Cost	Priority	Mandate
CNF-1	1,2,3,4,5,6	N/A	Sitka Street Park	The North Fork was diverted from this area in the 1960s. The original channel was dewatered but still exists through the park. Approximately 2,200 feet of prime Coho salmon rearing habitat exists in the dewatered channel and can be restored.	Construct a diversion at Sitka Street to route the North Fork base flow to the channel through Sitka Street Park while bypassing peak flood flows down the current ditched channel.	WMS	6	2	ADF&G
CNF-2	5,6	N/A	North Fork at Sitka and Davis Parks	No educational information available	Place kiosks at Sitka Street Park and Davis Park on LID, pesticide use, fertilizers and pets.	AWC	1	3	APDES
CNF-3	1,4	N/A	North Fork at Mountain View	Headwaters are highly developed curb and gutter, increasing runoff and pollutants into creek	Evaluate, prioritize and construct headwater street retrofits in Mountain View to improve stormwater.	WMS	4	1	APDES

Little Campbell Creek
Watershed Management Plan
2018 Updates
By
Anchorage Waterways Council
February 1, 2019

Water Quality

Goal: Improve overall water quality in Little Campbell Creek and prevent further degradation.

Strategy: Identify and implement projects that reduce sediment and other pollutants by reducing point and non-point sources.

Priority	Implementation Strategy	Action Items	Anticipated Start/End	Cost Estimate	Evaluation Methods/Milestones
1	1.1. Identify and analyze LCC subbasins, stream banks and channel for hydrologic, sediment and other select pollutant contributions. Prioritize to mitigate quantified impacts above reference condition.	<ul style="list-style-type: none"> • Verify/modify current subbasin delineation • Model pollutant/stormwater runoff with SWMM using values and select pollutants from Chester Creek model with ditch areas added • Determine subbasins with most pollutants/stormwater runoff and map • Evaluate sediment contribution by stream banks/channel and compare to a stable reference condition • Determine erosion rates on stream and if it is above a reference condition and map • Prioritize subbasins/ channel issues by cost/benefit and strategize mitigation measures 	<i>Start:</i> 2009 <i>End:</i> 2012	\$150k for modeling and FWS assistance with WMS staff on sediment estimates	<i>Milestones:/</i> <ul style="list-style-type: none"> - RFP to WTF/WMS for review - Obtain Funding - Report and Map - WTF formal recommendation - Selection of top three projects.
2	1.2. Based on results identified in 1.1a prioritization, implement first three projects.	<ul style="list-style-type: none"> • Design (Drawings, Specs, Report, Bid Document, Cost) for each project • Put projects on CIP list • Construct projects 	<i>Start:</i> 2011 <i>End:</i> 2013	Design: \$140 - \$200k	<i>Milestones:</i> <ul style="list-style-type: none"> - Obtain Funding - Top three on CIP list for 2011 - Projects constructed by 2012
3	1.3 Incorporate BMPs into existing and future drainage projects.	<ul style="list-style-type: none"> • Incorporate end-of-pipe treatment to all new and retrofit projects (i.e. OGS) • Strategize and make recommendations on current projects in RFP 27-P041 for 64th, 72nd, and 88th Ave. drainage improvement projects. • Implement Low Impact Development strategies and Action Plan 	<i>Start:</i> 2007 <i>End:</i> Ongoing	Incorporate as part of cost estimates for CIP projects.	<i>Milestones:</i> <ul style="list-style-type: none"> - Each drainage improvement utilizes best practices.

Priority	Implementation Strategy	Action Items	Anticipated Start/End	Cost Estimate	Evaluation Methods/Milestones
4	1.4. Improve existing sedimentation ponds to current MOA design criteria standards (i.e. wetland incorporation, sizing criteria).	Design Study Reports on improvement options and preferred alternative with concept costs on sedimentation ponds: <ul style="list-style-type: none"> Meadow Park (Meadow St. at 68th) Brayton near 82nd St. north of Dimond. Pebblebrook (68th and Carriage St.) Desiree and 64th <ul style="list-style-type: none"> Design (Drawings, Specs, Report, Bid Document) Construct Projects 	<i>Start:</i> February 2009 <i>(after CIP priority list is completed)</i>	Design - \$75k per sediment pond Construct of wetlands only - \$100k/basin	<i>Milestones:</i> - Funding Obtained - One project/year starting in 2009 - Constructed 2012

2013 UPDATE

- 1.1 Plan to review 2012 Anchorage Waterways Council "Creek Report Card" for issues found by observations and incorporate information into "Restoration Opportunities.
- 1.3 64th, 72nd, and 88th Ave. drainage improvement projects have been completed.
- 1.3 Low Impact Development Plan has been completed by consultant and provided to MOA, need to implement projects.
- 1.4 Meadow Park has restored wetlands at the corner of 68th and Meadow from work by AWC, GLT, USFWS, and inkind donations in 2007. Beavers removed from sedimentation pond at Meadow Park in 2009 because of culvert blocking under 68th and further down under the New Seward Highway.

2016 UPDATE

- None to report.

2017 UPDATE

- None to report.

2018 UPDATE

- None to report.

Water Quantity

Goal: Reduce flood hazards and prevent habitat degradation.

Strategy: Maintain existing floodplains and widen existing floodplains where applicable.

Priority	Implementation Strategy	Action Items	Anticipated Start/End	Cost Estimate	Evaluation Methods/Milestones
1	2.1. Preserve existing floodplain and restore or recreate historic floodplain.	<ul style="list-style-type: none"> • Preserve undeveloped floodplain lands through conservation easements from owners for priority areas identified by WMS, Flood Hazard Program, Taskforce subcommittee, GLT and WAG – first is the Vander Court area and near Meadow Park. • Identify MOA and private properties with floodplains and work to preserve areas identified as important for reducing flood hazards. 	2007 and ongoing	Varies	<ul style="list-style-type: none"> - Complete Vander Court area by Spring 2008 (GLT) - Evaluate critical floodplain for acquisition winter, 2008 - Acquire critical floodplain areas as able
2	2.2. Update floodplain data and mapping.	<ul style="list-style-type: none"> • Create updated floodplain mapping for entire LCC. • Implement Action Item 1.1 to identify stormwater runoff mitigation areas 	<i>Start:</i> 2007 <i>End:</i> 2012	Varies depending on current information	<ul style="list-style-type: none"> - Evaluate current HDR /Shannon Wilson
	2.3. Remove restrictions to flood flows.	<ul style="list-style-type: none"> • DOT to replace culverts under New Seward Highway to minimize current flood hazard issues. • Design Report evaluating other flood flow restrictions, alternatives, improvements to public safety and cost benefit of removal. • Design and Construct top three restrictions. 	DOT current upgrade project. <i>Start:</i> 2007 Others	\$150k Design Study Report for overall evaluation.	<ul style="list-style-type: none"> - Design Report complete by 2010. - Design and construct top three by 2014.

2013 UPDATE

- 2.1 The MOA WMS has created a website that provides scanned FEMA flood hazard maps at <http://anchoragewatershed.com/femaFHmaps.html>. This can be used to identify MOA and private properties that may be subject to flooding.
- 2.1 Remove many of the illegal foot bridges and small dams along LCC as identified in the AWC's "Creek Report Card" summary because of the potential to cause flooding.
- 2.1 Vander Court area was acquired and restored.
- 2.1 Floodplain was evaluated and has a prioritization on the GLT list.
- 2.3 AKDOT will need to review their priorities for the culvert replacement under the New Seward Highway.

2016 UPDATE

- 2.3 According to AKDOT&PF Eric Miyashiro (11/4/16), 12' x 3' box culverts will replace the existing culverts under the Seward Highway (including frontage roads) for the North and South Forks of Little Campbell Creeks. A similar box culvert will also be constructed for the South Fork of Little Campbell Creek at Sandlewood Place as part of the Seward Highway/Diamond Blvd to Dowling Rd Reconstruction Project.

2017 UPDATE

- 2.3 Box culverts have replaced the existing culverts under the Seward Highway (including frontage roads) for the North and South Forks of Little Campbell Creeks. A similar box culvert was also constructed for the South Fork of Little Campbell Creek at Sandlewood Place as part of the Seward Highway/Diamond Blvd to Dowling Rd Reconstruction Project. Photos included.

2018 UPDATE

- 2.2 The MOA WMS has created an interactive map for floodplain mapping at <http://moapw.maps.arcgis.com/apps/Viewer/index.html?appid=1687cdfa5f1e499d985e734dff9cc72f>

Terrestrial Habitat

Goal: Evaluate and maintain wildlife corridors and expand where appropriate for the benefit of wildlife and people.

Strategy: Establish a Little Campbell Creek greenbelt; preserve and enhance wildlife corridors and existing riparian habitat.

Priority	Implementation Strategy	Action Items	Anticipated Start/End	Cost Estimate	Evaluation Methods/Milestones
1	3.1. Identify and prioritize lands for inclusion in LCC riparian corridor.	<ul style="list-style-type: none"> Municipal land managers prioritize lands Work with public and private entities to preserve areas identified. 	Start: In process	Varies	Acres and linear feet of creek preserved Milestones: Have greenbelt plan at the end of 2008.
2	3.2. Identify, map, and maintain wildlife corridors.	<ul style="list-style-type: none"> Planning to evaluate current MOA mapping and update. 	Start: 2008	In house coordination with ADF&G.	Map in early 2008. In-house
3	3.3. Create program that offers assistance for restoration of riparian habitats.	<ul style="list-style-type: none"> Program created with local nurseries and the State Plant Material Center to provide riparian species to MOA and landowners Create a pamphlet for landowners that explains the benefits of riparian buffers and suggested plants for distribution through local nurseries. 	Start: February 2008	~\$30K.	Milestones: Educational pamphlet complete in 2008.
4	3.4. Improve small animal passage along creek corridors.	<ul style="list-style-type: none"> Incorporate small animal passage in new or retrofit projects for road crossings. 	Start: January 2008	Varies	Milestones: - Small animal passage included for identified fish passage projects.

2013 UPDATE

- 3.1 Riparian corridors can be gleaned partially from the recently updated MOA 2012 Wetlands Atlas at <http://www.muni.org/Departments/OCPD/Planning/Projects/Documents/AWMP-March2012PHD-5-6-12.pdf> although it should be noted that this has not been adopted yet. This should also be coordinated with ADF&G.
- 3.3 A pamphlet has been designed and printed by AWC for landowners titled "How to live with a creek". It provides important information on riparian buffers and setbacks, and its distribution will begin in fall 2013. See example at end of document.
- 3.4 Small animal passage along creek corridors should be coordinated between ADF&G and AKDOT on projects along creeks.

2016 UPDATE

- None to report.

2017 UPDATE

- None to report.

2018 UPDATE

- 3.1 In 2018 the Municipality of Anchorage adopted changes to the stream setback provisions of Title 21 such that Little Campbell Creek and all of its major tributaries will have a 50-foot stream setback.

Aquatic Habitat

Goal: Improve fish passage, channel habitat maintain flows to support fish and creek function in the watershed.

Strategy: Provide unimpeded fish passage, restore straightened channels, protect and increase wetland habitat.

Priority	Implementation Strategy	Action Items	Anticipated Start/End	Cost Estimate	Evaluation Methods/Milestones
1	4.1. Upgrade culverts identified in ADF&G culvert survey that impede fish passage.	<ul style="list-style-type: none"> Design and construct top 10 prioritized culverts – first eight are (AF&G ID): <ul style="list-style-type: none"> #103- North Fork (Abbott Road) #105-South Fork (Atkins/near 85th) #150- North Fork (Lake Otis Pkwy/72nd) The other culverts identified are: #99, 107, 126, 125, 124 Ensure fish passage through Alaska Zoo Ensure fish passage along new Elmore Road New Seward Highway culverts – work with DOT to produce best design possible -has highest long-term impact for fish passage. 	<i>Start:</i> February 2008 <i>(Road upgrade schedule applies)</i>	\$1.5 million first 5 culverts in SSSP grant. DOT cost unknown for #103 or New Seward Highway replacements. All other culverts on municipal streets.	<i>Evaluation Methods:</i> - Culverts replaced - Miles restored <i>Milestones:</i> - Top 3 culverts 2009 - Top 10 culverts 2012
2	4.2a. Restore modified channels for habitat improvements.	<ul style="list-style-type: none"> Assess, design and construct the top creek restoration projects – first five are: <ul style="list-style-type: none"> 1st : Replace 360 foot long culvert at DNS concrete with open channel. 2nd: Parcel-72nd South of Parcel 3nd: Parcel-Galatea Estates 4rd: Turinski Parcel east of Lake Otis Parkway 5th: Channel South of 88th. Ave. 	<i>Start:</i> June 2008		<i>Evaluation:</i> - Linear feet restored <i>Milestones:</i> - First restoration in 2008 - Top three 2011
3	4.3a. Construct, restore, and preserve wetlands and open water habitats.	<ul style="list-style-type: none"> Acquisitions and protections related to 2.1. Support ADF&G in-stream flow gauging and apply for instream flows. 	2007 and ongoing	\$40k for gauging	In-stream flow reservation by 2010

Note: Culvert designations are found at http://www.sf.adfg.state.ak.us/SARR/Fishpassage/FP_mapping.cf

2013 UPDATE

- *The ADF&G now has an interactive mapper for culverts and information on them and fish passage at: <http://www.adfg.alaska.gov/index.cfm?adfg=fishpassage.mapping> . This is a valuable resource for prioritizing culvert issues.*
- *4.1 A report on fish passage through the Alaska Zoo was completed by HDR in December 2008, and is titled, “South Fork Little Campbell Creek Fish Passage Assessment” and this is in the design phase..*
- *4.2a There was culvert work at DNS Concrete in 2012 for fish passage, but the original plan of a 360’ culvert was not practical. The parcel at 72nd Ave (if this is the one just east of Lake Otis), has been accomplished. Also, fish passage along new Elmore Road has been completed.*
- *4.2a There as a road culvert replacement on Dimond Hook where it changes to E. Dimond Blvd. on the S. Fork of LCC. Culvert replacement was also accomplished at 82nd and Sandlewood on the S. Fork of LCC. According to the ADF&G interactive mapper, the culvert south of 88th looks to have been replaced. Also, parcels on 72nd, Galatea Estates and the Turinski parcel east of Lake Otis have been completed.*
- *AKDOT is still working to replace culverts under the New Seward Highway.*
- *ADF&G has attempted to complete an instream flow reservation on LCC, but funding to finalize 2 years of data gathering has not been forthcoming. AWC has gathered 3 years of data where LCC joins Campbell Creek.*

2016 UPDATE

- *4.1 Culverts #105-South Fork (Atkins near 85th), #150-North Fork (Lake Otis Pkwy/72nd), #99, and #107were replaced by The Boutet Company.*
- *4.1 Ensure fish passage through Alaska Zoo was completed by The Boutet Company in 2015 but fish cannot pass through a perched culvert at the east end of the zoo.*
- *4.2a Replace 360’ long culvert at DNS Concrete with open channel. This was completed by The Boutet Company although overall culvert length is 336’.*

2017 UPDATE

- *4.1 Box culverts have replaced the existing culverts under the Seward Highway (including frontage roads) for the North and South Forks of Little Campbell Creeks. A similar box culvert was also constructed for the South Fork of Little Campbell Creek at Sandlewood Place as part of the Seward Highway/Dimond Blvd to Dowling Rd Reconstruction Project. See action item 2.3 above. Photos included.*

2018 UPDATE

- *In 2018 the Municipality of Anchorage adopted changes to the stream setback provisions of Title 21 such that Little Campbell Creek and all of its major tributaries will have a 50-foot stream setback.*

Recreational and Economic Opportunities

Goal: Promote recreational and economic benefits of healthy watersheds.

Strategy: Promote benefits of the link between healthier watersheds and recreational and economic benefits to the community.

Priority	Implementation Strategy	Action Items	Anticipated Start/End	Cost Estimate	Evaluation Methods/Milestone
1	5.1. ID specific cost/benefits of LCC to Anchorage economic sectors	<ul style="list-style-type: none"> Create a study of the value of LCC creeks and riparian areas to the community. Distribute the results of the study to local business and residential groups. 	<i>Start:</i> 2008	Varies	Program evaluation by 2009
2	5.2. Create a business partnership program for businesses located on the banks of LCC.	<ul style="list-style-type: none"> Annual program to meet business owners, distribute information on LCC and make recommendations as appropriate. “Creek Steward” sticker program with participating businesses and related advertising of them. Work with businesses to distribute benefit data to other groups. 	<i>Start:</i> 2007	\$30K/Year	Program established for 5 Years, 2007-2012
3	5.3 Create wetland preservations incentives	<ul style="list-style-type: none"> Evaluate current wetland mitigation program and ways to improve it. Evaluate subdivision guidelines for wetland preservation. Create a public access map in relation to Park and other access areas. 	<i>Start:</i> in process	Varies	Program evaluation by 2009
4	5.4 Create public access awareness and access points as appropriate	<ul style="list-style-type: none"> Evaluate with Parks Dept. potential for more access points Update map and make available for LCC outreach program Include LCC information on interpretive displays in Campbell Creek and other restoration projects within the watershed 	<i>Start:</i> 2008	In-house	Complete in 2009 and as Restoration projects are Completed.

2013 UPDATE

- *5.3 Much of the information gathered by the AWC “Creek Report Card” project applies here. One of the major issues commented on was lack of access. A large portion of LCC runs through private yards with fences.*
- *5.3 A map of Campbell and Little Campbell Creeks has been completed by AWC for distribution at REI. This map could be altered easily to show access points.*
- *5.4 A kiosk with an interpretive sign and a case for current information from Polaris School students has been placed at the corner of 68th and Meadow by AWC.*

2016 UPDATE

- *None to report.*

2017 UPDATE

- *5.3 Public access map draft attached. A map of Little Campbell Creek created and printed by AWC in 2009 could be updated and reprinted. Copy attached.*

2018 UPDATE

- *None to report.*

Communication and Coordination

Goal: Promote watershed awareness and community stewardship.

Strategy: Increasing public involvement in stewardship activities.

Priority	Implementation Strategy	Action Items	Anticipated Start/End	Cost Estimate	Evaluation Methods/Milestones
1	6.1. Promote LCC Watershed Management Plan implementation within the municipality.	<ul style="list-style-type: none"> WMS assigns responsibility for plan implementation. Coordinate with Watershed Task Force (WTF) to promote plan projects. WMS prepares annual State of the LCC Watershed Report for review by WTF. Partners will provide support in development of this report. WTF review report and makes recommendations for plan updates, revision and priorities to Mayor. 	<i>Start: 2008</i>	Varies	<i>Milestones:</i> <ul style="list-style-type: none"> Plan being implemented. Report ready for WTF to review. Report recommended to Mayor. Report available to public.
2	6.2 Increase community understanding of watershed problems and solutions within watershed.	<ul style="list-style-type: none"> Provide support and funding to watershed education programs. Workshops with local utilities, MOA departments, businesses, contractors on watershed issues and solutions. Create a “Creekside Stewardship” program and offer to people who own land adjacent to LCC to promote a positive stewardship ethic. Give out “care of your creek” information packet. 2-3 workshops with real estate community to create an information packet on “care of your creek” to go to new land owners. Work with ASD and ADF&G to develop riparian buffer studies, a “Salmon in the Classroom” program, and “It takes a watershed to raise a fish” curricula and/or other programs. Create an “Adopt-A-Stream” program with local schools. 	<i>Start: 2008</i>	Varies	-Start in 2008 and continue program for 5 years.

Priority	Implementation Strategy	Action Items	Anticipated Start/End	Cost Estimate	Evaluation Methods/Milestones
3	6.3. Increase outreach and education program within the Municipality.	<ul style="list-style-type: none"> • Hire WMS outreach staff person. • Increase partnering with agencies, nonprofits, and other entities to deliver stewardship messages. • Update WMS website on a regular basis. 	<i>Start:2008008008</i>	\$100K/year	Hire staff person in 2008 Update website in 2008

2013 UPDATE

- 6.1 The Watershed Task Force has been morphed into the Watershed Roundtable which tries to meet quarterly.
- 6.3 The MOA WMS is promoting information on creeks, watershed plans, and other information on its new website at anchoragewatershed.com.
- 6.1 AWC also hosts the LCC and Chester Creek watershed plans (the former adopted, the latter being worked on) on its website at anchoragecreeks.org.
- 6.2 AWC has designed and printed “How to live with a creek” which will begin distribution to creekside parcels (residences and businesses) in fall 2013.
- 6.2 AWC has also provided brochures and “talking points” to various property manager organizations and has developed a card for “do-it-yourself” rental companies to give to customers renting excavation equipment, etc. (See end of document for example.)
- 6.2 AWC’s Adopt-A-Stream program varies by group. Several reaches have been adopted, but the motivation to perpetuate the work year after year often wanes. New groups come along.
- 6.2 AWC is also doing the stormwater outreach and education for the MOA’s APDES permit.

2016 UPDATE

- None to report.

2018 UPDATE

- 6.2 AWC has completed 8 years of “Creeks as Classrooms” education to K-university.
- 6.2 During 2018, changes to the MOA’s Design Criteria Manual were adopted. These changes became effective January 1, 2019. As part of these changes, natural vegetation and wetlands retention are identified as a specific BMP available for control of stormwater runoff volume and quality. This change is intended to help incentivize preservation of wetlands and other riparian habitat during site development.

Open Space

Goal: Protect and maintain lands that support healthy watershed functions and services.

Strategy: Healthy, sustainable watershed functions that can be self-maintaining and actively used for recreation.

Priority	Strategy	Action Items	Start/End	Cost Estimate	/Milestones
1	7.1. Identify, map and prioritize parcels for potential preservation, restoration and recreational open space.	<ul style="list-style-type: none"> Implement Action Items in Goals “Terrestrial Habitat (Priority 1)”, “Aquatic Habitat (Priority 3)” and “Recreational and Economic Opportunity (Priority 3)”. 	2007 and ongoing with yearly evaluation and task responsibilities	Varies	- Yearly updates of priority list and CIP list
2	7.2. Implement acquisitions and easement plan	<ul style="list-style-type: none"> Implement Action Item in 7.1. 	2007 and ongoing.	Varies	- One area conserved on a yearly basis.

- This is more in the hands of the Municipality and the Great Land Trust.*

- None to report.*

2013 UPDATE

- None to report.*

2016 UPDATE

- None to report.*

2017 UPDATE

- None to report.*

2018 UPDATE

Data Acquisition

Goal: Identify significant gaps in data and create programs to acquire data.

Strategy: Create a database for Little Campbell Creek from which management decisions can be made based on science.

Priority	Implementation Strategy	Action Items	Anticipated Start/End	Cost Estimate	Evaluation Methods/Milestones
1	8.1. Obtain data necessary to maintain watershed health.	<ul style="list-style-type: none"> Evaluate sediment source inputs as discussed in Action Items of 1.1 as surrogate for all pollutants. Evaluate fecal coliform concentrations in LCC. Implement a continuous DO and temperature program to note seasonal changes in evaluation of fish habitat for natural and impacted 	2007 and ongoing	Varies	<ul style="list-style-type: none"> Sediment/coliform input report 2010. DO and Temperature 2008-2010. Fish/ Invertebrate Report 2009. Habitat Assessment by 2010
2	8.2. Create, maintain and make accessible to public all data on LCC.	<ul style="list-style-type: none"> Create website of data access online. Contact all resource agencies and both local universities for their data and/or references regularly. Compile and upload all data to MOA website. Maintain list. 	Start: 2008 End: 2009	\$40K	- Maintain yearly.
3	8.3. Evaluate ADF&G's grey designated culverts in LCC for fish passage issues.	<ul style="list-style-type: none"> Complete project between MOA and Alaska Department of Fish and Game. 	Start: Feb. 2008 End: 2009	\$70K	Evaluation finished in 2009

2013 UPDATE

- 8.1 Some fecal coliform studies (DNA) were done by ARRI (Aquatic and Restoration Research Institute) in 2010 titled, "Fecal Coliform Bacteria Source Assessment in the waters of Cottonwood Creek, Wasilla, and Little Campbell Creek, Anchorage". The point was to assess the origin of fecal contamination and was funded by ADEC. Two sites on the North Fork of LCC and three on the South Fork were studied, and other data were collected in the report.
- 8.1 AWC has 4 water quality monitoring stations on LCC, but keeping the CEMP (Citizens Environmental Monitoring Program) funded is problematic. It would appear that monitoring above and below the Alaska Zoo at times of heavy precipitation might be useful.
- 8.1 The AWC "Creek Report Card" project resulted in the entire creek (within the urban watershed) being walked and observations made. While this is not a true habitat assessment, it does contain some important information.
- 8.1 AWC has received an ACWA grant from ADEC to evaluate Mutt Mitt stations in the 8 primary urban watersheds to see if this can be a way to reduce fecal contamination.

2018 UPDATE

- *8.1 AWC received two ACWA grants from ADEC in 2014 and 2016 which added more pet waste stations in primary urban watersheds to see if this can be a way to reduce fecal contamination. There were 3 new Mutt Mitt stations added to the Little Campbell Creek watershed.*
- *8.1 AWC received an ACWA grant from ADEC in 2018 to evaluate fecal coliform data collected by CEMP water quality monitors between 2010 and 2017. Analysis is underway and will be reported during the 2019 update.*
- *Watershed Management Services has taken steps to ensure that the stream, watershed, and other related hydrologic features for the MOA are accurate, up-to-date, and widely available. Watershed Management Services's GIS information is available through web-based, interactive maps and via download of GIS data layers.*

○ How to Live With a Creek

The Municipality of Anchorage is about 2,000 mi² and has approximately 2,250 miles of creeks and rivers. These waterways are often listed as some of Anchorage's premier amenities. This handout endeavors to provide information on how to be a good neighbor to our creeks.

- ◆ **Be a steward for your local creek and keep an eye on it.** Report any issues online at anchoragecreeks.org and clean up any trash.
- ◆ **Don't alter the course of a creek.** Creeks have a mind of their own about where they want to go, which is protected by local, state, and federal law.
- ◆ **Stormwater and yard runoff, cigarette butts, pet waste, other pollutants and debris run directly into storm drains which lead to our creeks--NOT to the sewage plant.**
- ◆ **Don't water your driveway and paved areas, and don't overwater your yard.** Your yard only needs about 1" of water. Put an empty tuna can on the area you are watering, and when it is full--you have about 1" of water.
- ◆ **Sweep your driveway rather than power washing or hosing it.**
- ◆ **Direct your downspouts onto your yard and off of impermeable surfaces.** Also consider rain barrels and rain gardens to reduce yard runoff.
- ◆ **Use automatic car washes as their waste water is usually recycled and is directed into the sewage system--not our creeks.** If you wash at home, park your vehicle on grass or gravel, and use non-phosphate soap.
- ◆ **Ensure that storm drains and culverts are not clogged.** Obstructed culverts and storm drains can cause flooding and block fish passage.
- ◆ **Keep dogs and horses out of creeks and off of creek banks ESPECIALLY when salmon are spawning.** Bank trampling causes erosion and sediment to run off into waterways, which disturbs gravel beds where fish spawn and little ones grow.
- ◆ **Clean up pet waste because the fecal coliform bacteria found in it runs off into our creeks.** All the creeks in Anchorage (except Rabbit and Little Rabbit) are considered "impaired waters" due to fecal coliform contamination. Do your part to reduce this problem. **SCOOP-the-POOP!**



- ◆ **Protect and preserve shoreline vegetation and don't cut trees or remove vegetation within 25' of the creek.** This vegetation provides habitat, shade to keep the water cooler, protection from prey, and stabilization of the streambank. It also reduces bank erosion. Naturally fallen wood produces in-stream habitat and nutrients for fish and other aquatic organisms. Leave NATURAL vegetation in the creek.
- ◆ **Do not dump yard wastes into the creek or cut your lawn up to the creek's edge.** Yard waste contains chemical additives and high nitrogen and phosphorus. Rather than bag your grass clippings, leave them on the lawn as a source of fertilizing mulch. Yard waste that decomposes in streams and lakes will use up dissolved oxygen in the water that is essential for fish habitat. Leave native vegetation buffers creekside.
- ◆ **Don't disturb instream rocks or build dams and footbridges.** The undersides of rocks are habitat for macroinvertebrates, which are the food for fish, birds, and other aquatic organisms. Dams can block fish passage, and during high water events, dams and footbridges can catch debris and increase the likelihood of flooding in your yard.
- ◆ **Participate in the Anchorage Waterways Council's Annual Creek Cleanup (every spring), and become a member of the organization.** Memberships help support a variety of programs.

BE THE GUARDIAN OF YOUR CREEKS!



Anchorage Waterways Council is a non-profit 501 (c) (3) corporation that is funded by memberships, donations, and grants.

anchoragecreeks.org

907 272-7335

Follow us on Facebook at Anchorage Waterways Council

This is a 2-sided "rack card" that will be placed on door handles of homes and businesses along creeks.

PRIOR TO ANY EXCAVATION OR GROUND DISTURBING WORK:

- ◆ Ensure you know how to safely operate the equipment.
- ◆ Call "811" for the "Locates" on underground power, water, sewer, gas, electrical, cable, or phone lines BEFORE you dig.
- ◆ Check to see if you need any permits before you begin work. The reverse side of this card provides information on the most commonly needed for small projects.
- ◆ Watch overhead power lines when operating equipment.
- ◆ Do not cut or disturb any trees with nesting birds in them.
- ◆ Familiarize yourself with Anchorage's creeks and tributaries as some resemble ditches more than creeks.

DID YOU KNOW?

- ◆ Almost every creek and river in the Municipality is anadromous (salmon spawning), so they are protected under Alaska's statute known as the Anadromous Fish Act (AS 16.05.871)
- ◆ It is a violation of the **Clean Water Act** to dump or plow pollutants, such as soil, debris, vegetation, aggregate, or snow, into any creek or down any storm drain.
- ◆ "Dewatering" (removal of excess water) must be properly managed and not discharged into storm drains or other areas where it may flow into a waterway.
- ◆ Because storm drains discharge directly to waterways, without treatment by the Municipal sewer system, do not pour any paint, chemicals, gas, oil, or other pollutants into them.
- ◆ When washing equipment after use, hose it down on a pervious surface (such as lawn or gravel), or use a commercial spray wash station because that water is treated by the Municipal sewer system.
- ◆ Anchorage Municipal Code TITLE 21 regulates land disturbance activities adjacent to streams and watercourses. These include clearing of vegetation; grading, fill or excavation; location of buildings or structures; and channel alteration. Check with the Municipality to ensure compliance with the current stream setback regulations at library.municode.com/index.aspx?clientId=12717.

WHERE YOU CAN CHECK FOR PERMIT & REGULATION INFORMATION:

- ◆ **Municipal:** If ground disturbance is 500 sq. ft. or greater, check permit criteria and storm water pollution control plans at:
www.muni.org/Departments/OCPD/development/BSO/Handouts/handoutag21.pdf
- ◆ **State:** Alaska State statutes require notification and permit approval from the Alaska Department of Fish & Game before altering or affecting the "natural flow or bed" of a waterbody or stream. For full information, see:
www.adfg.alaska.gov/index.cfm?adfg=habitatregulations.prohibited
- ◆ A useful, comprehensive guide for the state of Alaska that covers all levels of permits has been published by the Alaska Department of Environmental Conservation at:
dec.alaska.gov/water/wmpspc/stormwater/Guidance.html
- ◆ **Federal:** Filling of waterways and wetlands is regulated by the Army Corps of Engineers. Information is at:
www.poa.usace.army.mil/Missions/Regulatory/Permits.aspx



Thank you for taking the time to read and use this information. By adhering to these regulations, you help ensure that our waterways and fish habitat will not be damaged by sediment, fill, and other pollutants.

If you would like additional information, please visit our website or contact us at the listing below.

Anchorage Waterways Council
P.O. Box 241774
Anchorage AK 99524
907-272-7335

Website: anchoragecreeks.org
Email: awc@anchoragecreeks.org

This is a 2-sided card that has been and is being distributed to "do-it-yourself" rental companies to provide their customers.

Stream Sign Location Report

Creek Signage Placement Municipality of Anchorage



Prepared by Anchorage Waterways Council

February 1, 2019



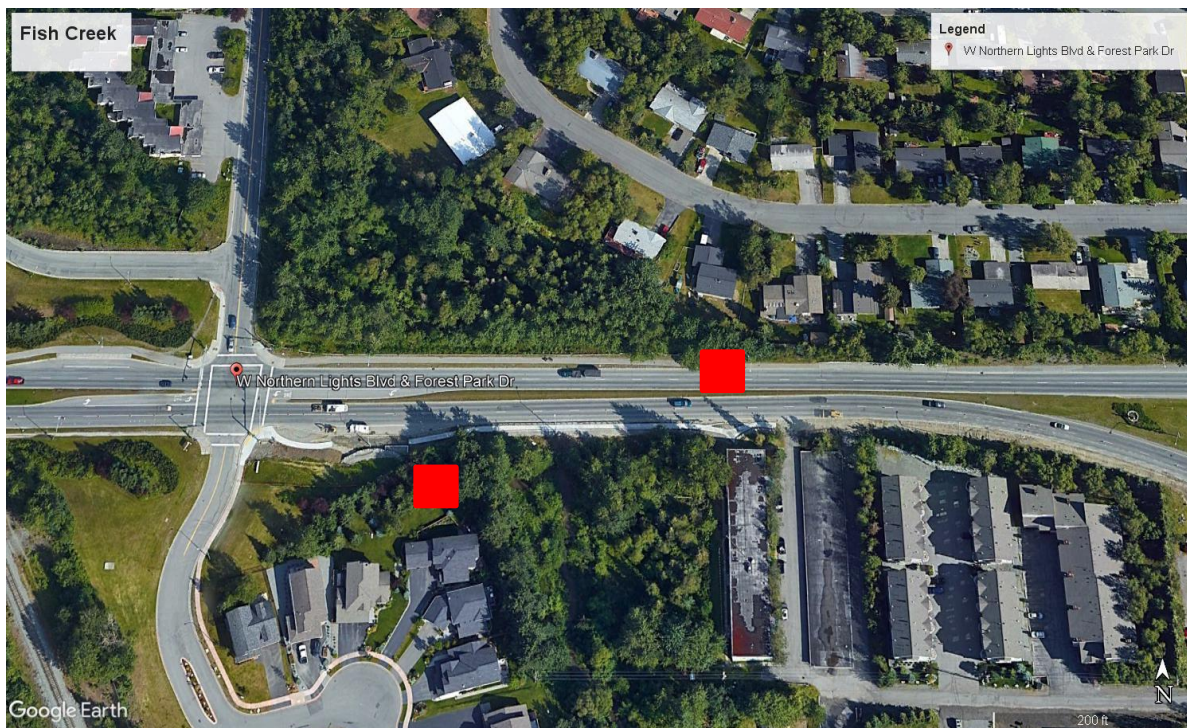
Placement of Creek Name Signs on Fish, Campbell, Little Campbell, Chester, and Ship Creeks

Thomas Eley, Ph.D.
Anchorage Waterways Council

The purpose of this project is to locate appropriate sites for creek name signs that could be placed where a major or important road crosses a creek. This would increase the public's awareness of Anchorage's many urban streams, which would hopefully encourage stewardship towards them. The report fulfills Action Item C-6 from the Municipality of Anchorage's Chester Creek Watershed Plan (2014). In this survey, signage within the Anchorage bowl for Ship Creek, Fish Creek, Chester Creek, Campbell Creek, and Little Campbell Creek is addressed. Sites were located using ArcGIS with Municipality of Anchorage GIS datasets for roads and creeks, and Google Earth Pro was used to further analyze sites. Areas with signage or needing signage follow. Those with red dots ● indicate that a sign is currently at that location, and a red square ■ means it would be a good place to put one. These are only suggestions and some may not be feasible for a variety of reasons. Photos of many creek signs are included, however some are not due to the inability to safely photograph them.

Fish Creek:

1. A good location for signage on Fish Creek would be on Northern Lights Blvd by Forest Park Drive. The creek is obvious to the trained observer, but many people drive right over the creek with even knowing.

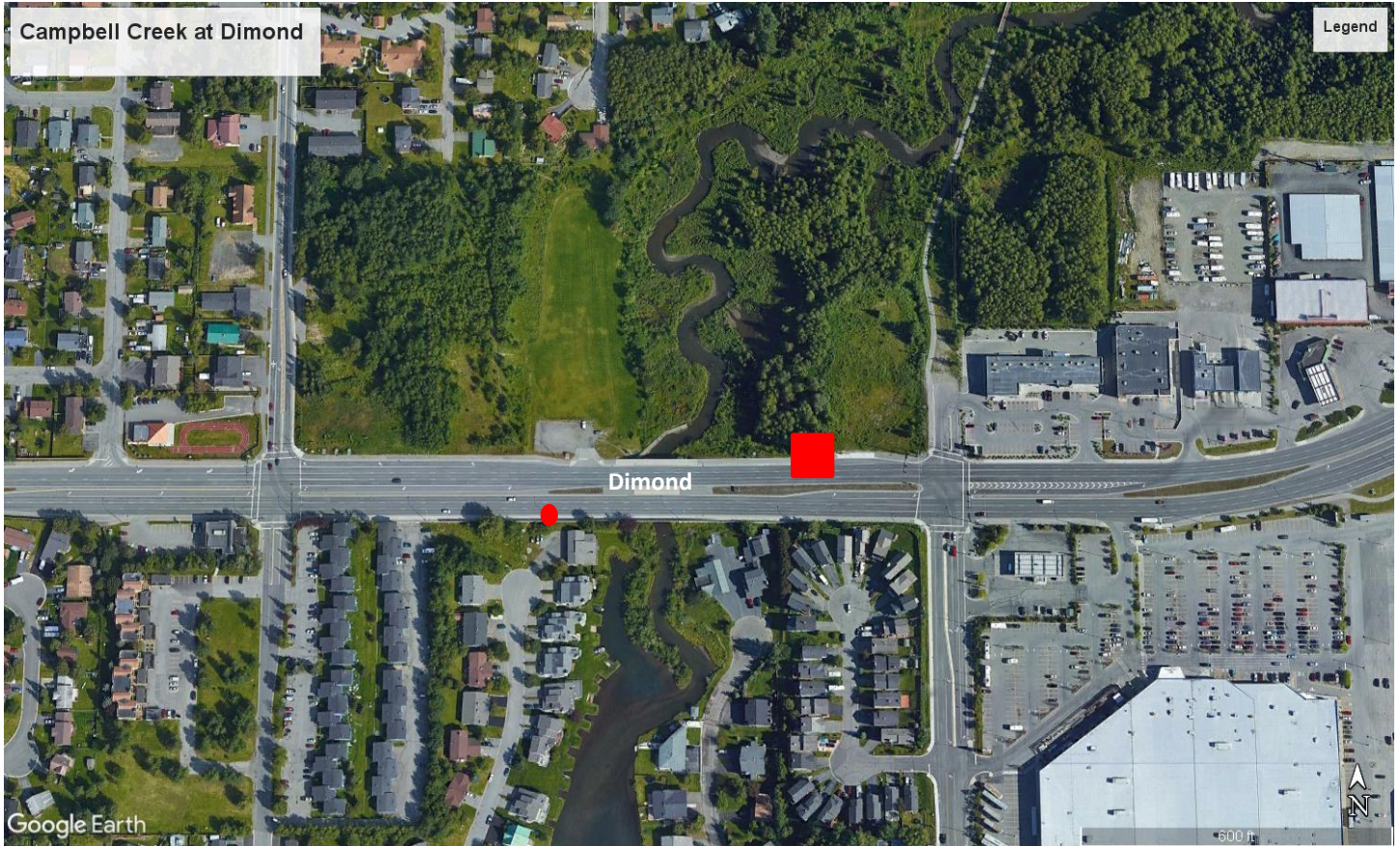


2. Fish Creek at Spenard has two small signs, which is important for Fish Creek which spends so much time underground.

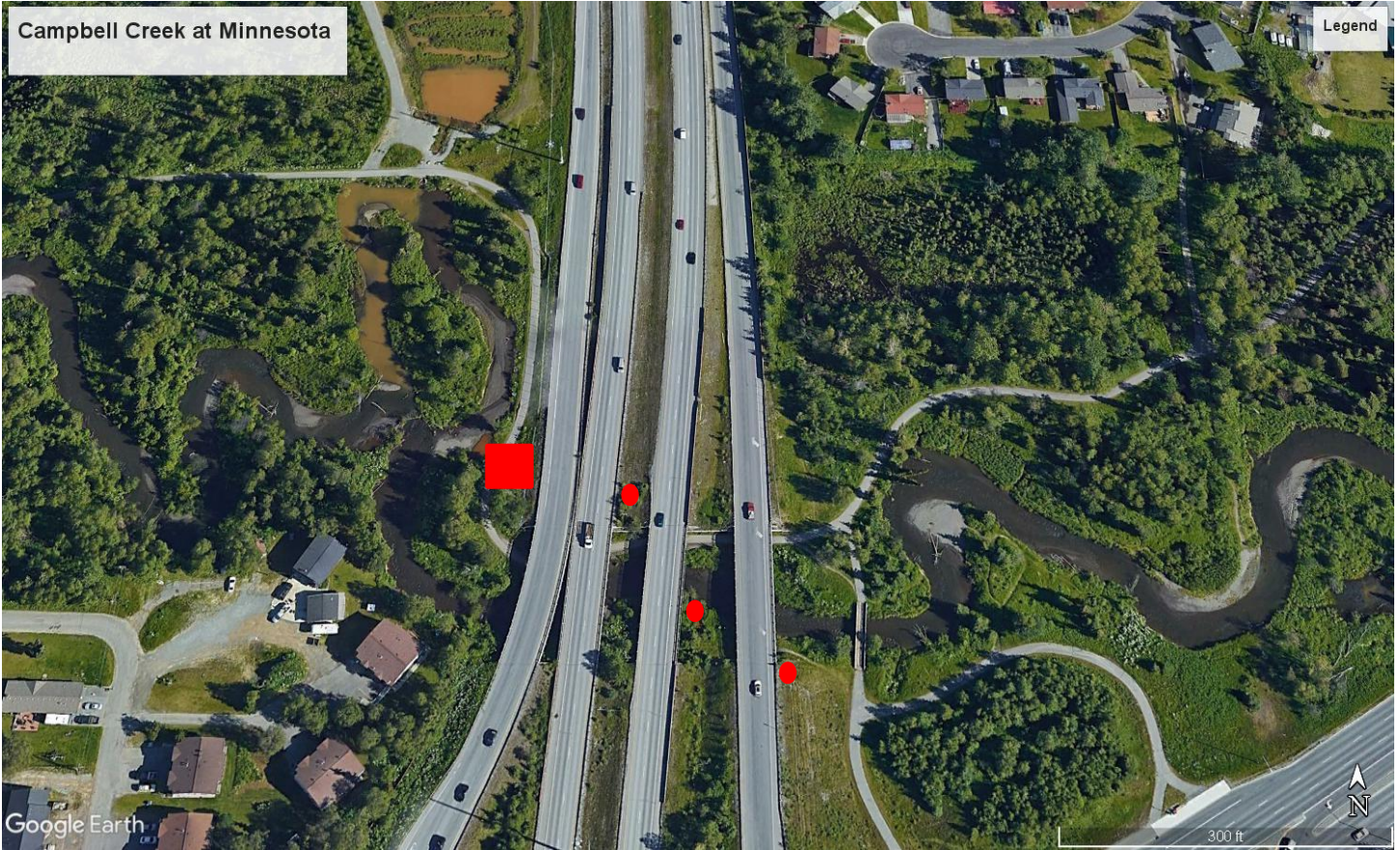


Campbell Creek:

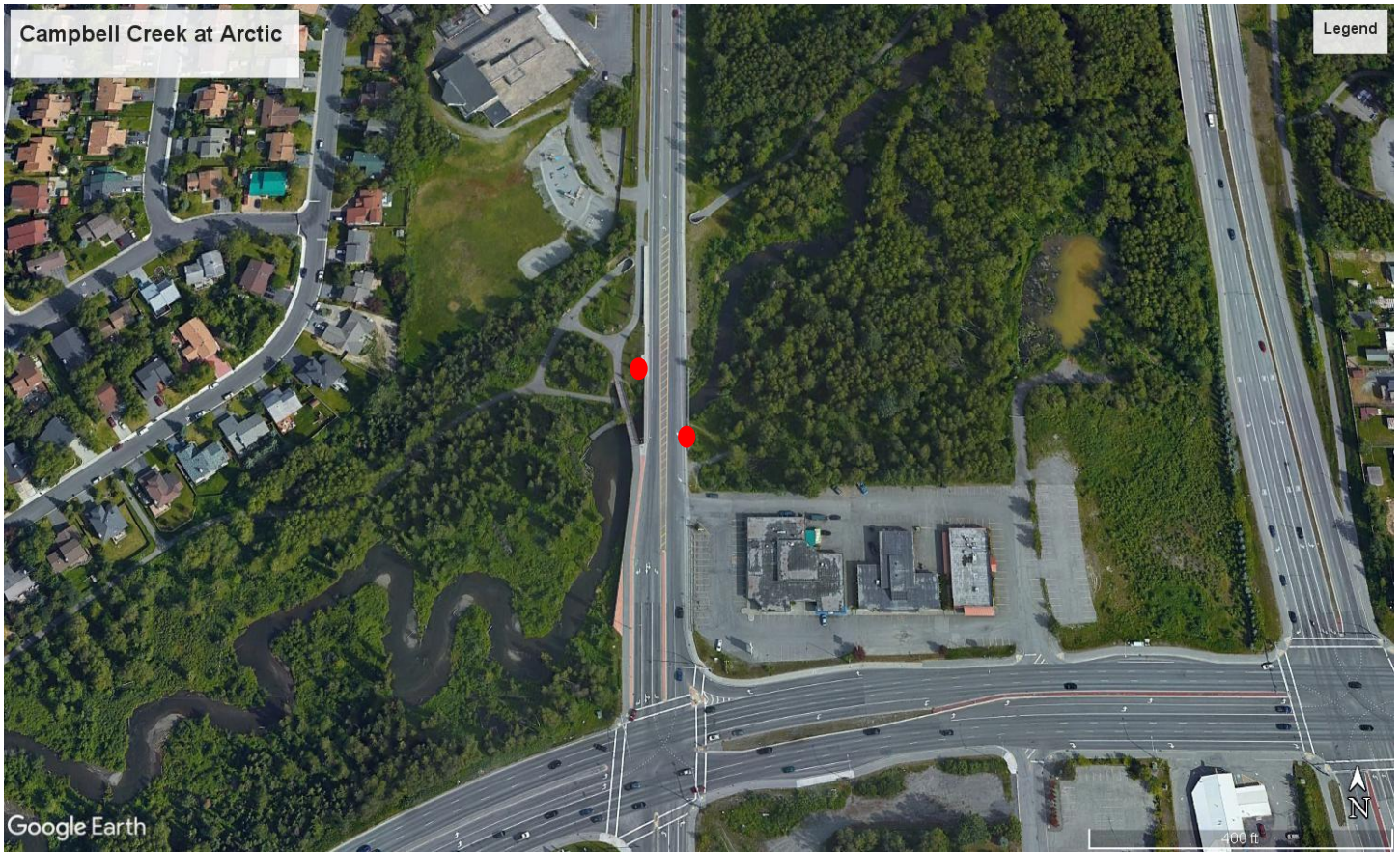
1. Campbell Creek at Dimond Blvd before it enters Campbell Lake. This is a high traffic area along with a fishing dock and greenbelt trails. There is already a small sign on the south side of Dimond, but it's not very apparent (maybe larger?). The red square denotes an area where a sign should be placed.



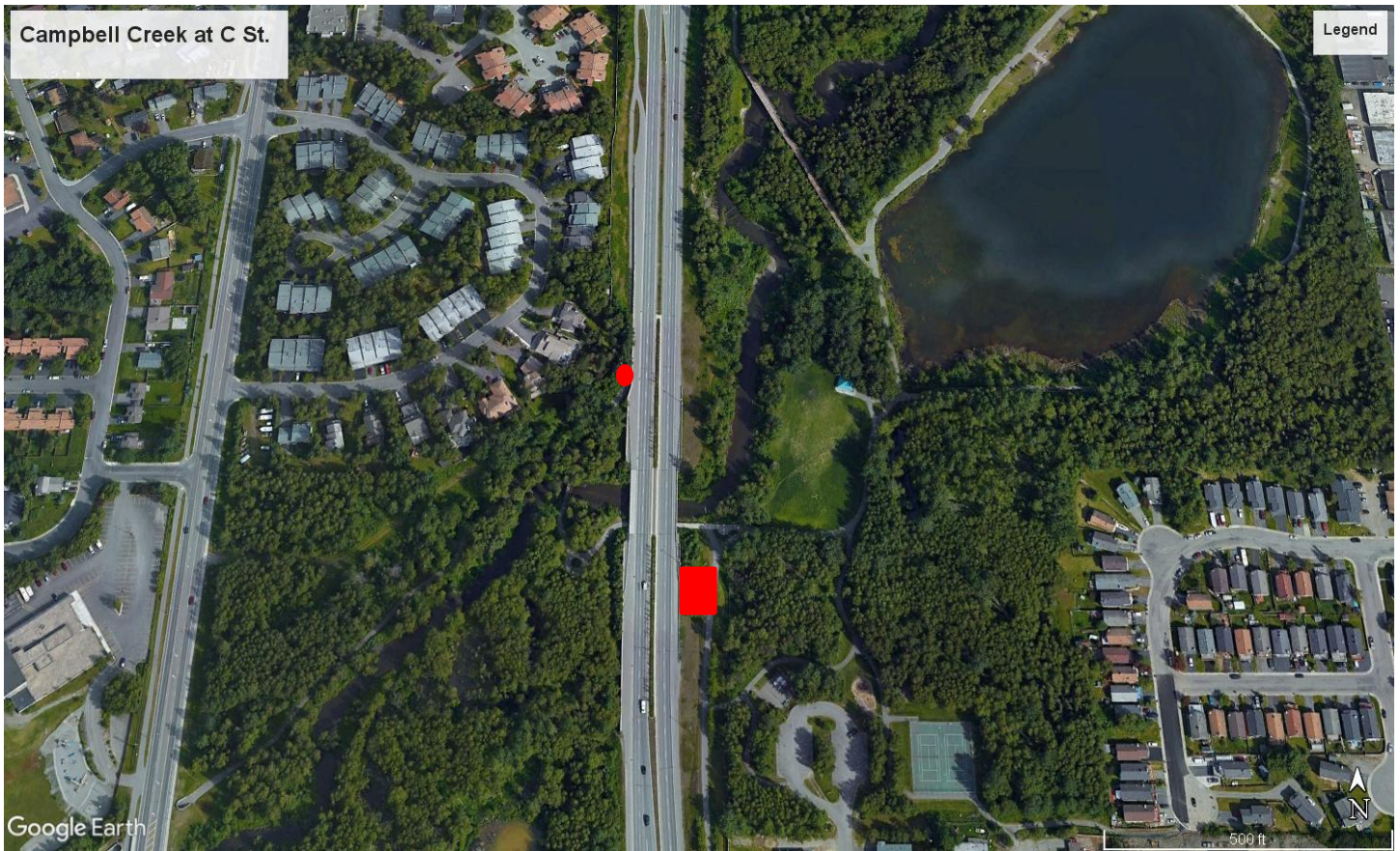
2. Campbell Creek at Minnesota Dr. Another high traffic area. There are 3 signs (two for northbound and one for southbound), but one by the offramp heading south to Dimond would be nice.



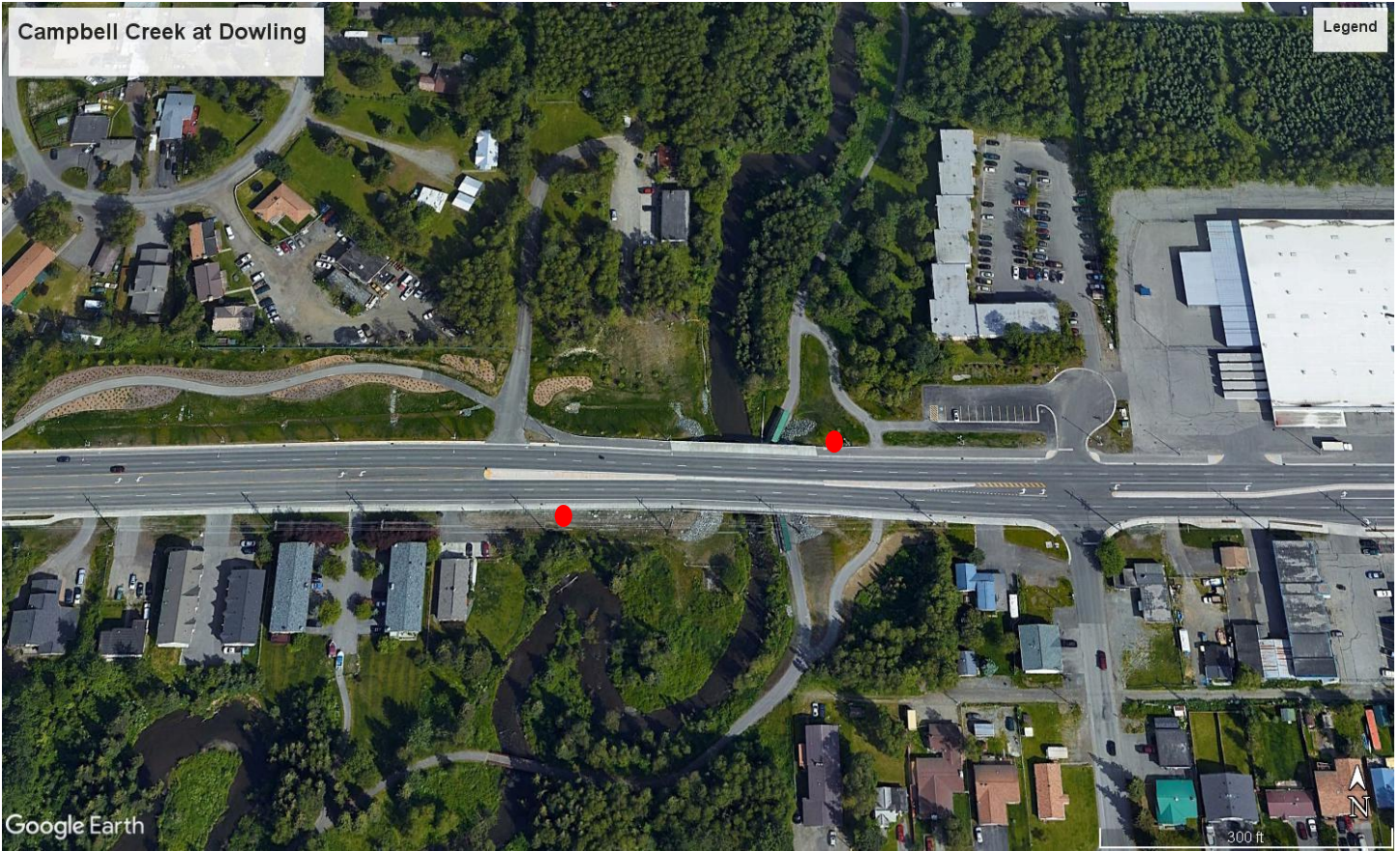
3. Campbell Creek at Arctic Blvd. This is a high traffic area along with a fishing dock and greenbelt trail access. There are signs on both the northbound and southbound sides of Campbell Creek.



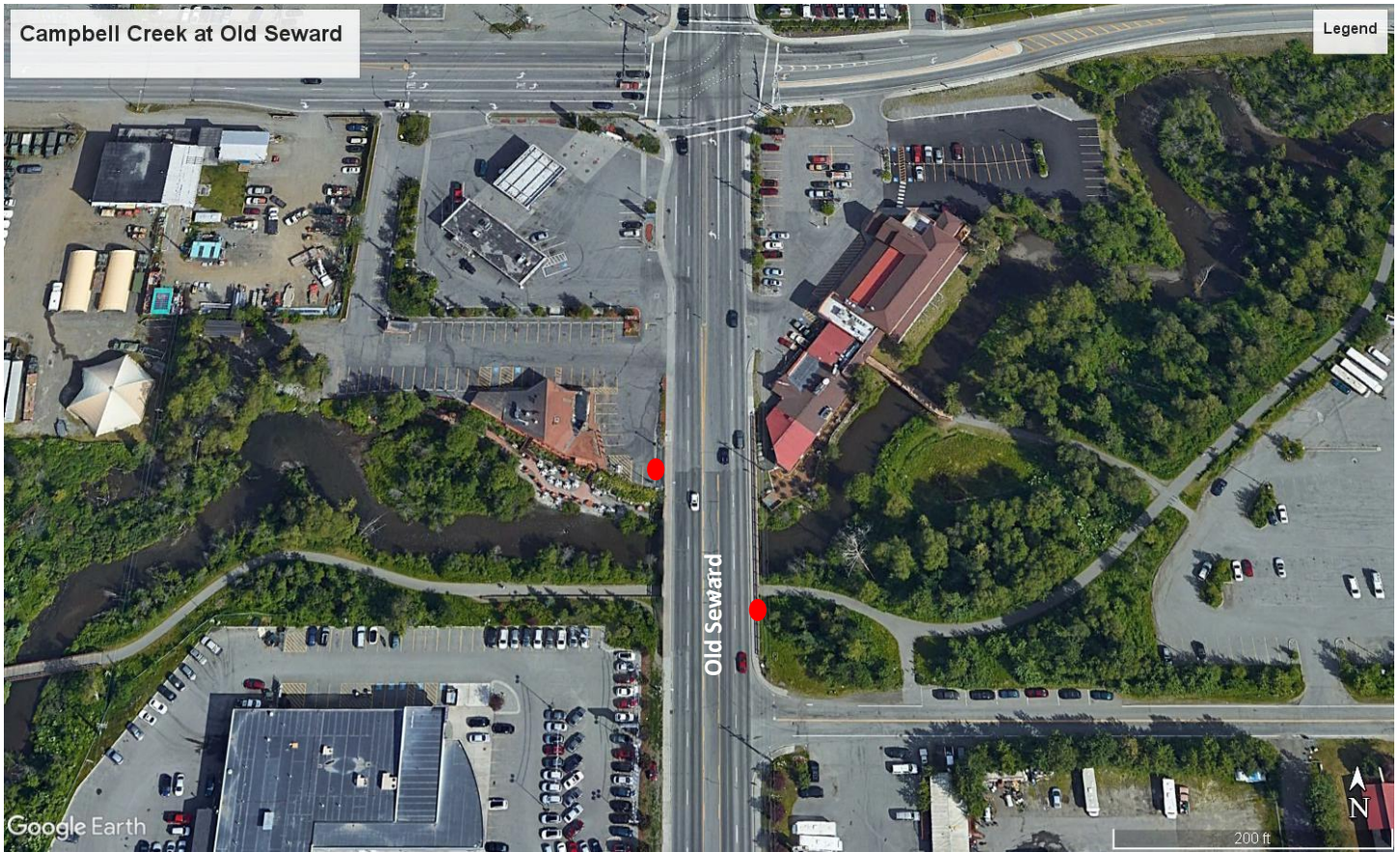
4. Campbell Creek at C Street north of Dimond. A heavy traffic area with access to Taku Lake. One sign by the southbound lane, none on northbound.



5. Campbell Creek at Dowling Road. This area was recently redone and has a parking area and access to the Campbell Creek Greenbelt trail system. Two new large signs are located there.



6. Campbell Creek at the Old Seward. A well-used route with local businesses along the creek. There are medium size signs on both the north and southbound lanes.

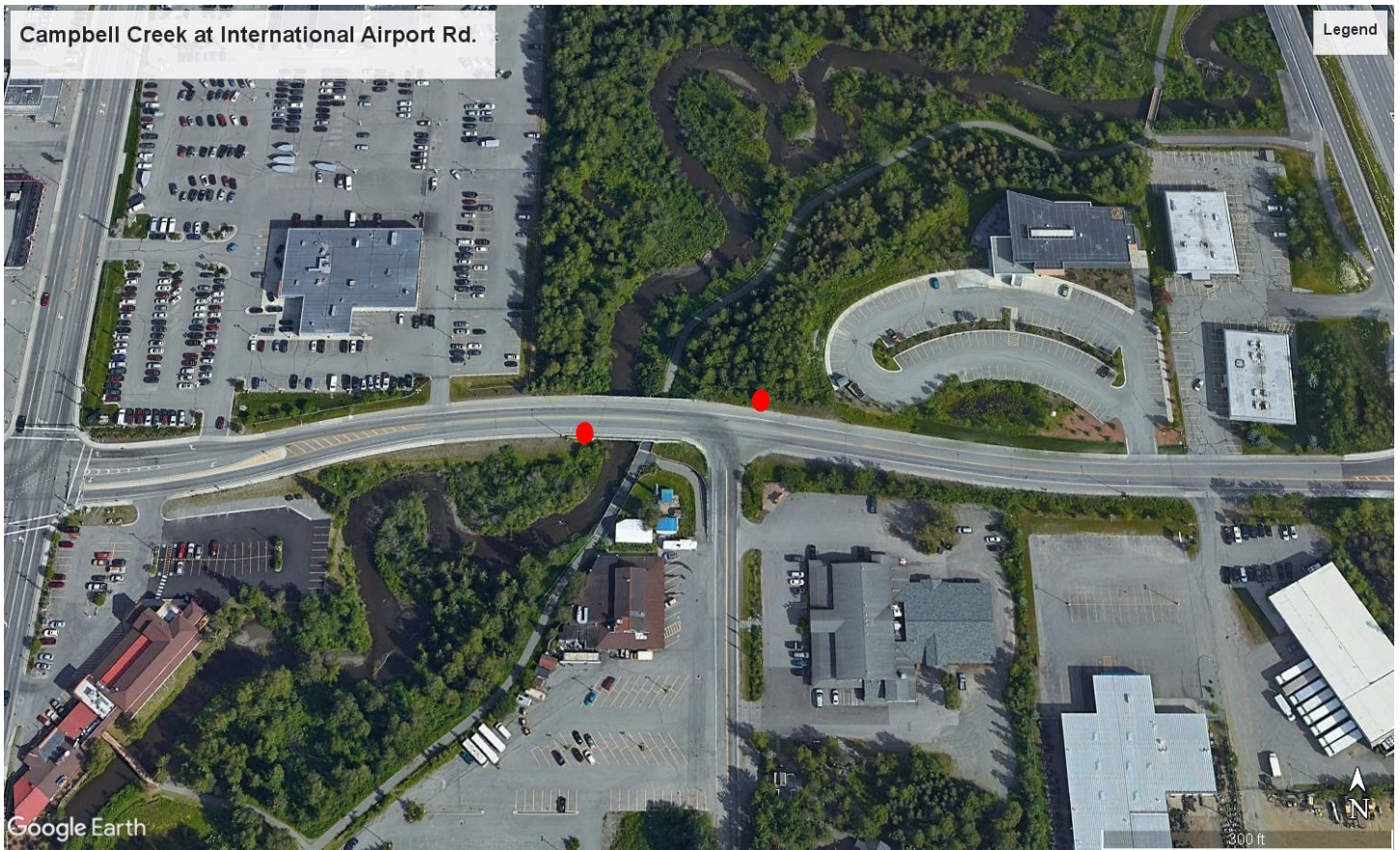


Northbound Old Seward



Southbound Old Seward

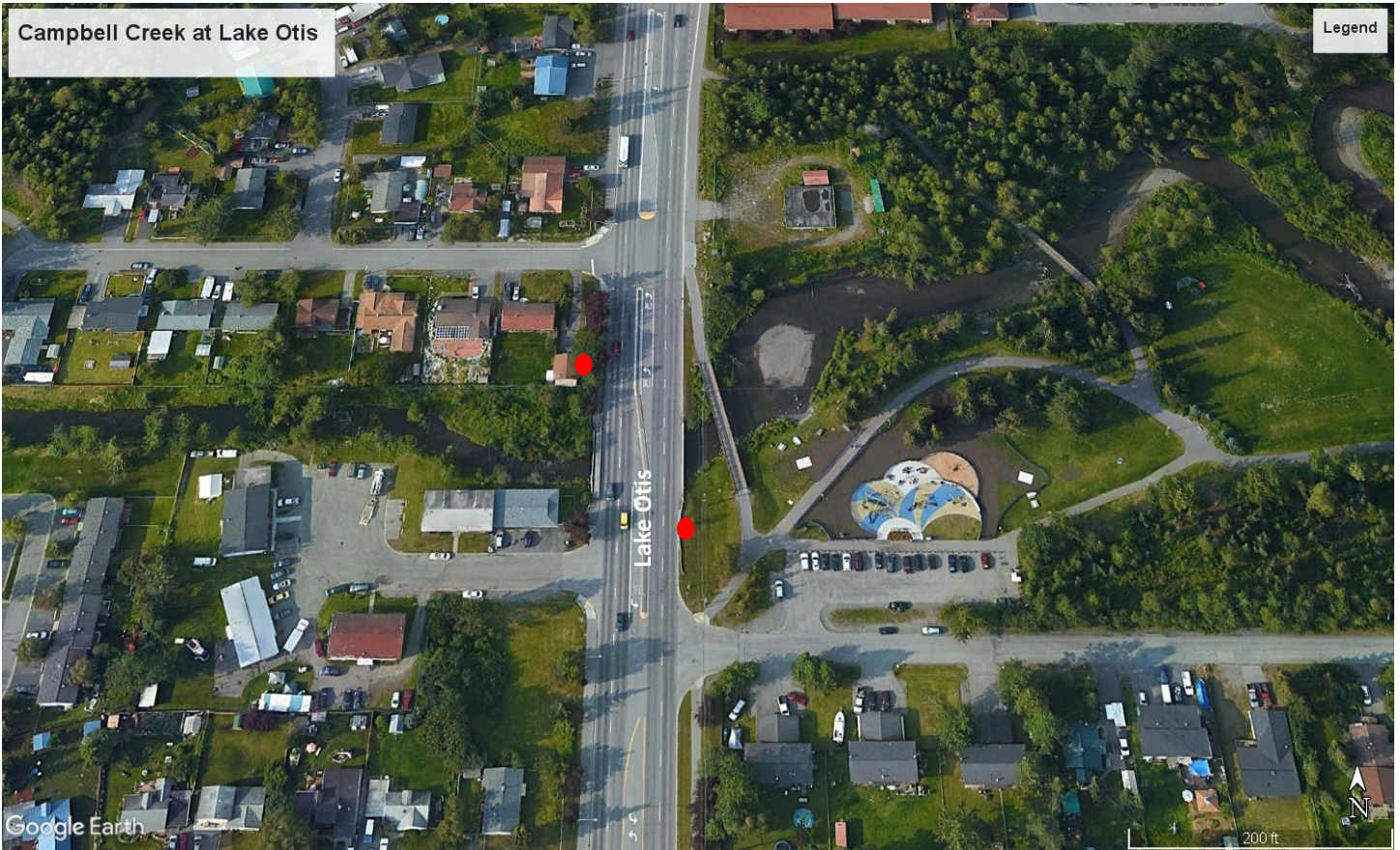
7. Campbell Creek at International Airport Rd. Two signs on the road here which is a common area for rafters. Also it's the location of the Alaska Wildberry Co., the former Sourdough Mining Co., and the Peanut Farm's parking lot.



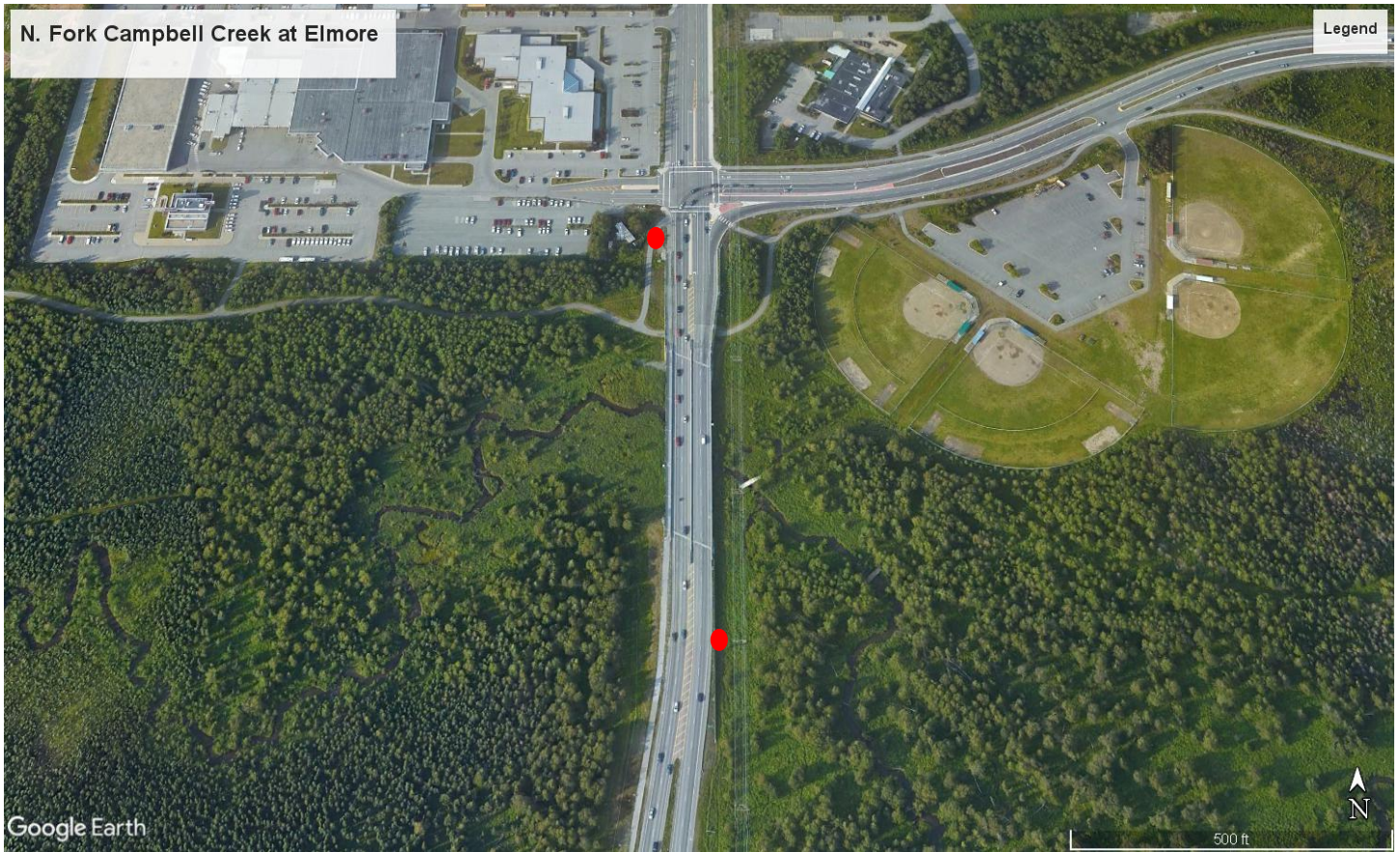
8. Campbell Creek at the New Seward. The New Seward's expansion shows two large signs for both north and southbound lanes.



9. Campbell Creek at Lake Otis. This is a high recreation use area with a popular park and trails. Additionally, Lake Otis has a high traffic flow. There is one sign at north and southbound lanes.



10. North Fork Campbell Creek at Elmore. Elmore is a busy thoroughfare that was upgraded in 2007. There are large creek signs for both north and south bound lanes.

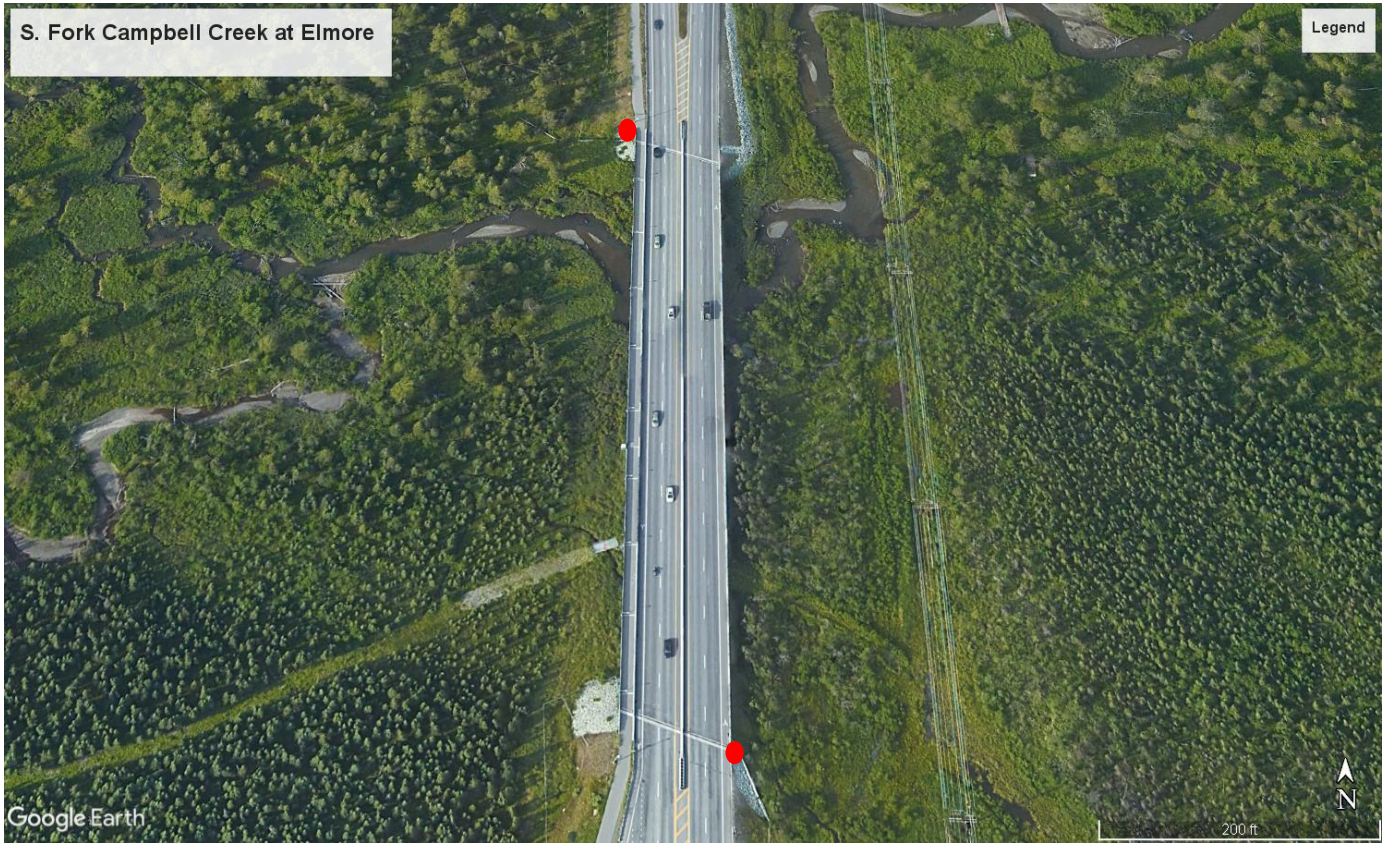


N. Fork Campbell at Elmore – northbound



N. Fork Campbell at Elmore - southbound

11. South Fork Campbell Creek at Elmore. Elmore is a busy thoroughfare that was upgraded in 2007. There are large creek signs for both north and south bound lanes.



S. Fork Campbell at Elmore – northbound



S. Fork Campbell at Elmore - southbound

12. North Fork Campbell Creek at Campbell Airstrip Road. Despite its size, the North Fork of Campbell Creek in this area has two small signs.



Northbound Campbell Airstrip Rd.



Southbound Campbell Airstrip Rd.

Little Campbell Creek

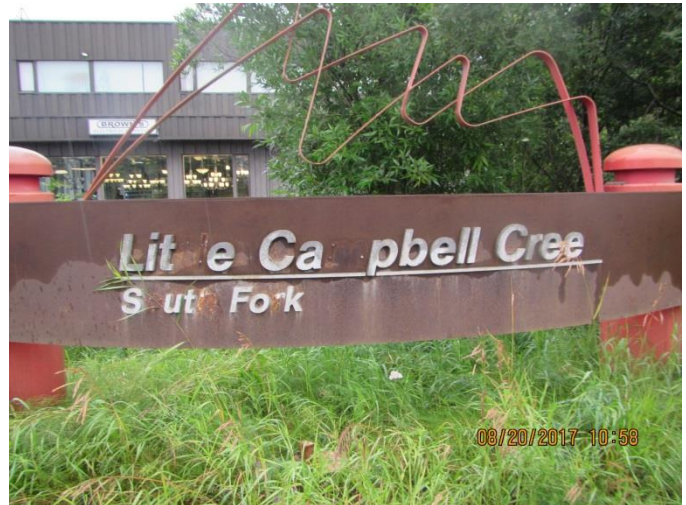
1. North Fork Little Campbell Creek at Old Seward. Signs present but are in dire need of repair and cleaning.



North Fork Little Campbell Creek east of Old Seward

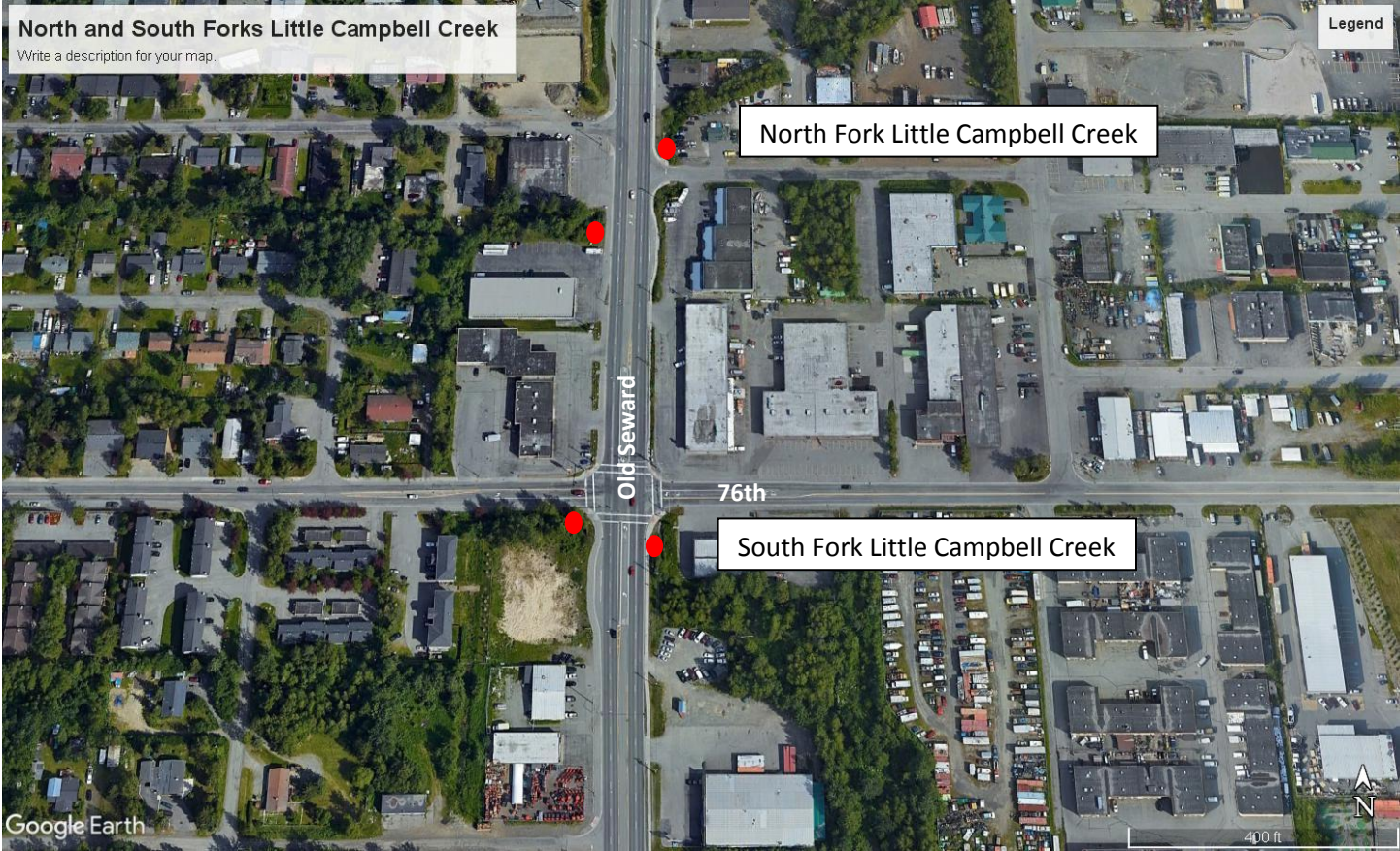
North Fork Little Campbell Creek west of Old Seward

2. South Fork Little Campbell Creek at Old Seward. Signs present but are in dire need of repair and cleaning.



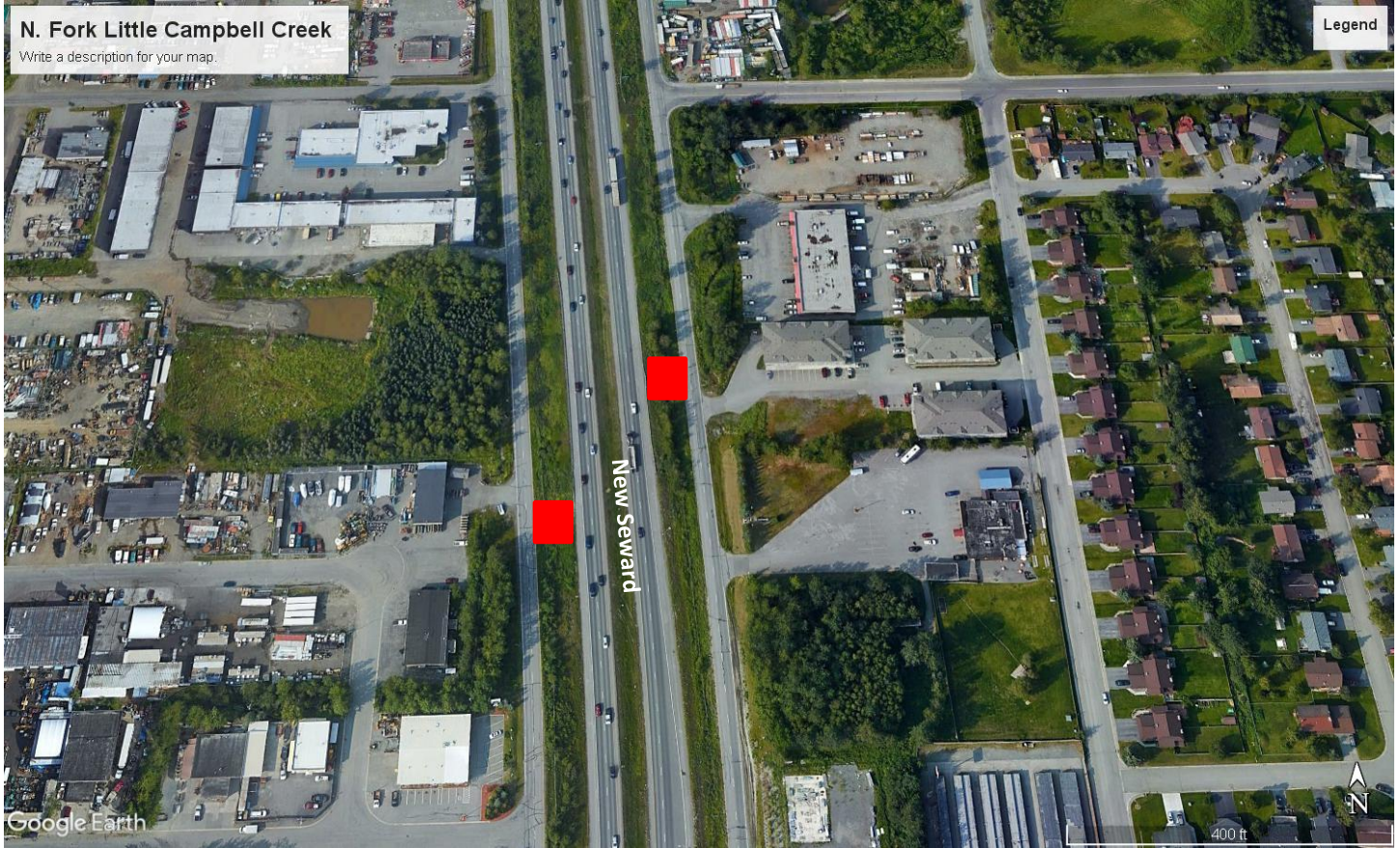
South Fork Little Campbell Creek east of Old Seward

South Fork Little Campbell Creek west of Old Seward

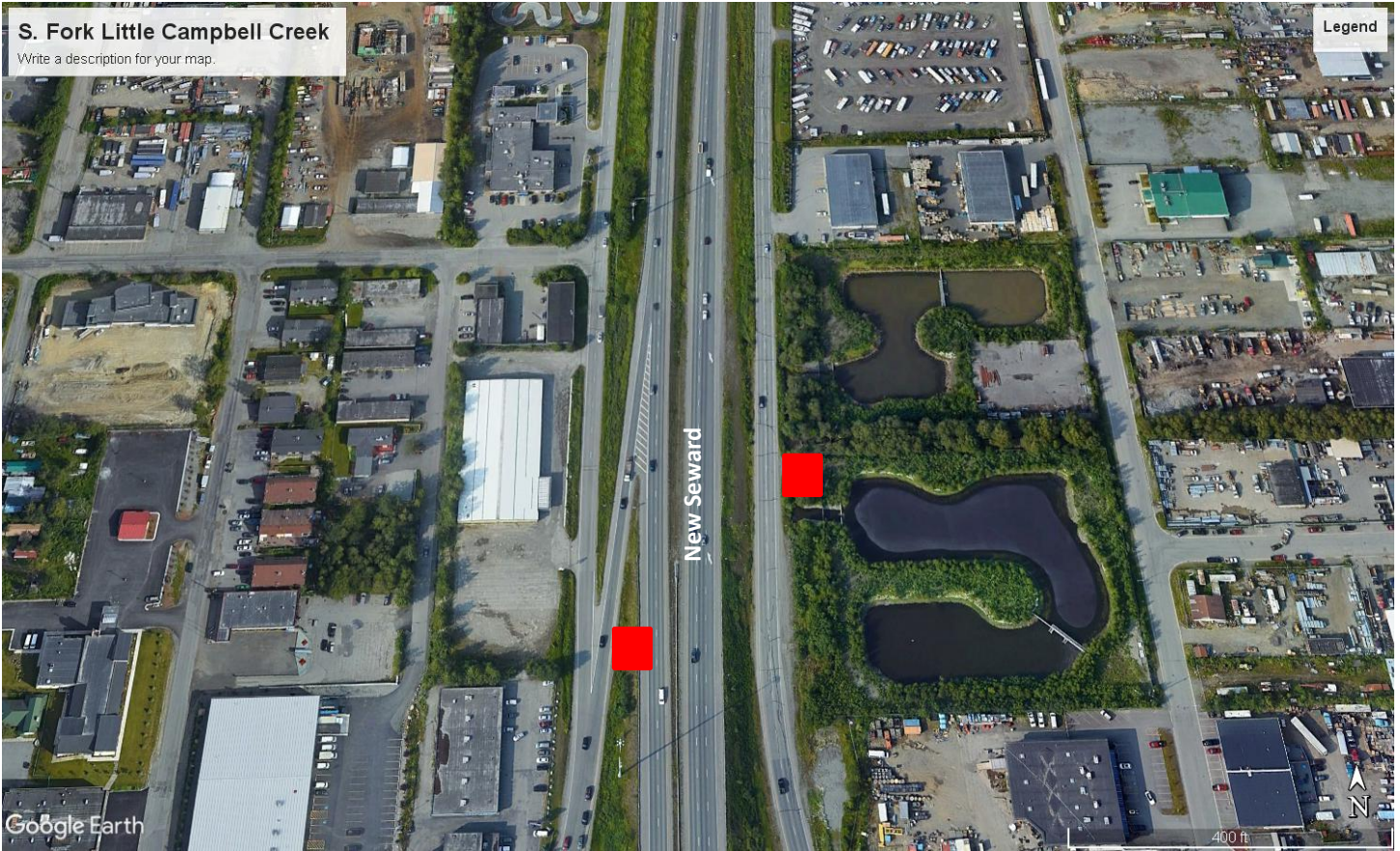


Possible locations on Little Campbell Creek.

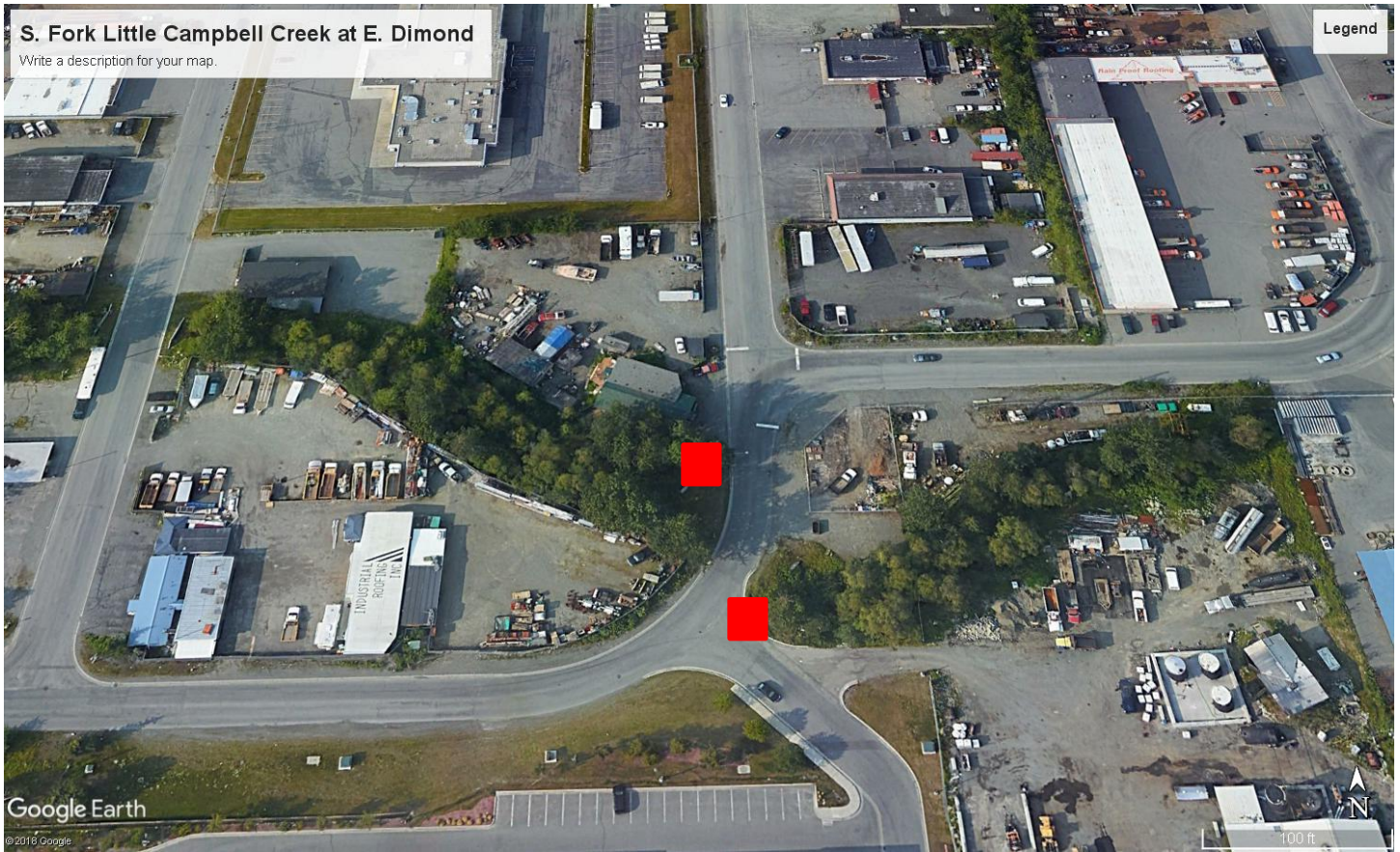
1. North Fork Little Campbell Creek at the New Seward. With the new box culverts under the New Seward, it would be nice to have signage between Brayton (northbound) and Homer (southbound).



2. South Fork Little Campbell Creek at the New Seward. This part of Little Campbell Creek is not very visible, although it might be good to put signage between the frontage roads, Homer and Brayton, to educate people on the creek's existence.

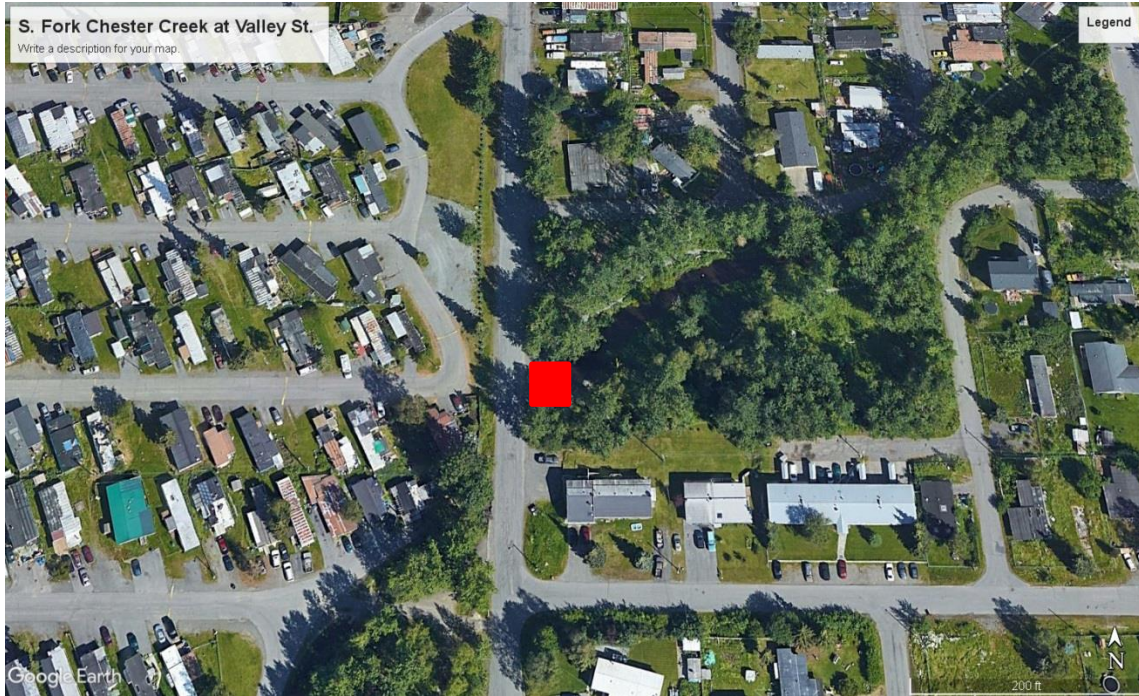


3. S. Fork Little Campbell Creek at E. Dimond. The culvert at this crossing was redone about 10 years ago. This is largely an industrial area, but the creek crossing is significant and labeling the creek would be beneficial.



Chester Creek

1. North Fork of the South Fork Chester Creek at Valley St. (Valley St. Park). The folks in this area have continually failed to recognize that this is a creek and not a ditch.



S. Fork Chester Creek at Valley Street Park (hardly a park and barely a creek)

2. South Fork Chester Creek at Muldoon. This is a busy area and the creek has been rerouted. This imagery does not show the new creek alignment which was finalized in 2016.



3. South Fork Chester Creek and Creekside Center Dr. This section of Chester Creek is subject to great abuse especially from kids. Shopping carts and stolen bikes are frequently pushed off the road over the creek. There are two signs there.

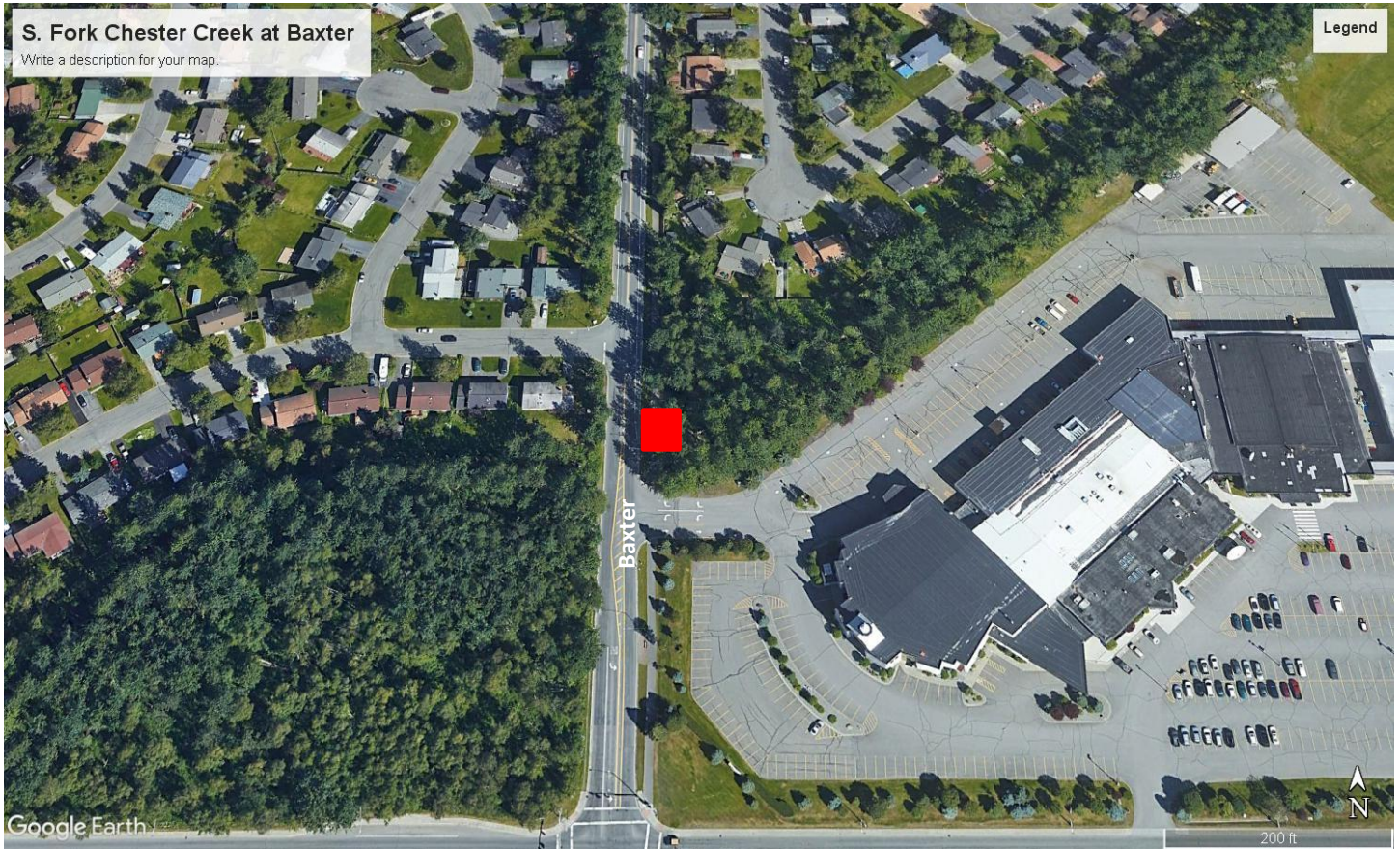


Creekside looking east



Creekside looking west

4. South Fork Chester Creek at Baxter Rd near the Baptist Temple. The creek in this area does not receive the recognition that it deserves, and there are continual problems with pushing snow into the creek as well as trash. Signage might help make a difference.



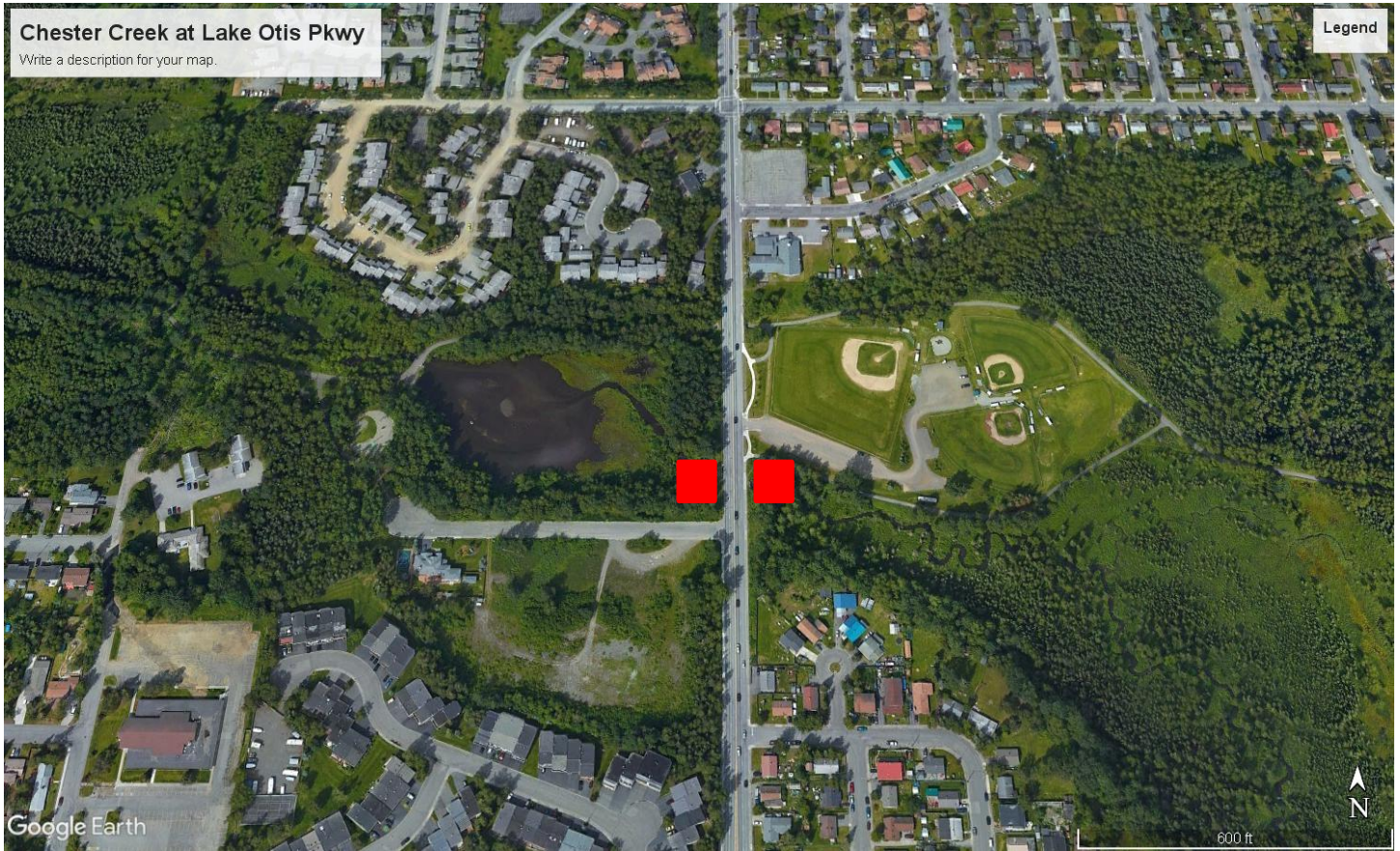
5. South Fork Chester Creek at Elmore Dr. UAA and University Lake. Signage on Elmore plus a sign where Chester Creek descends into University Lake would probably be educational particularly for the large number of pet owners at the dog park.



6. Chester Creek at Northern Lights. Northern Lights is a busy thoroughfare where Chester Creek might benefit from signage as people travel over it.



7. Chester Creek at Lake Otis Parkway. A narrow 4 lane thoroughfare that crosses Chester Creek at a low point. Medium size signage would help people to know where it is—especially since it is right out the car window.



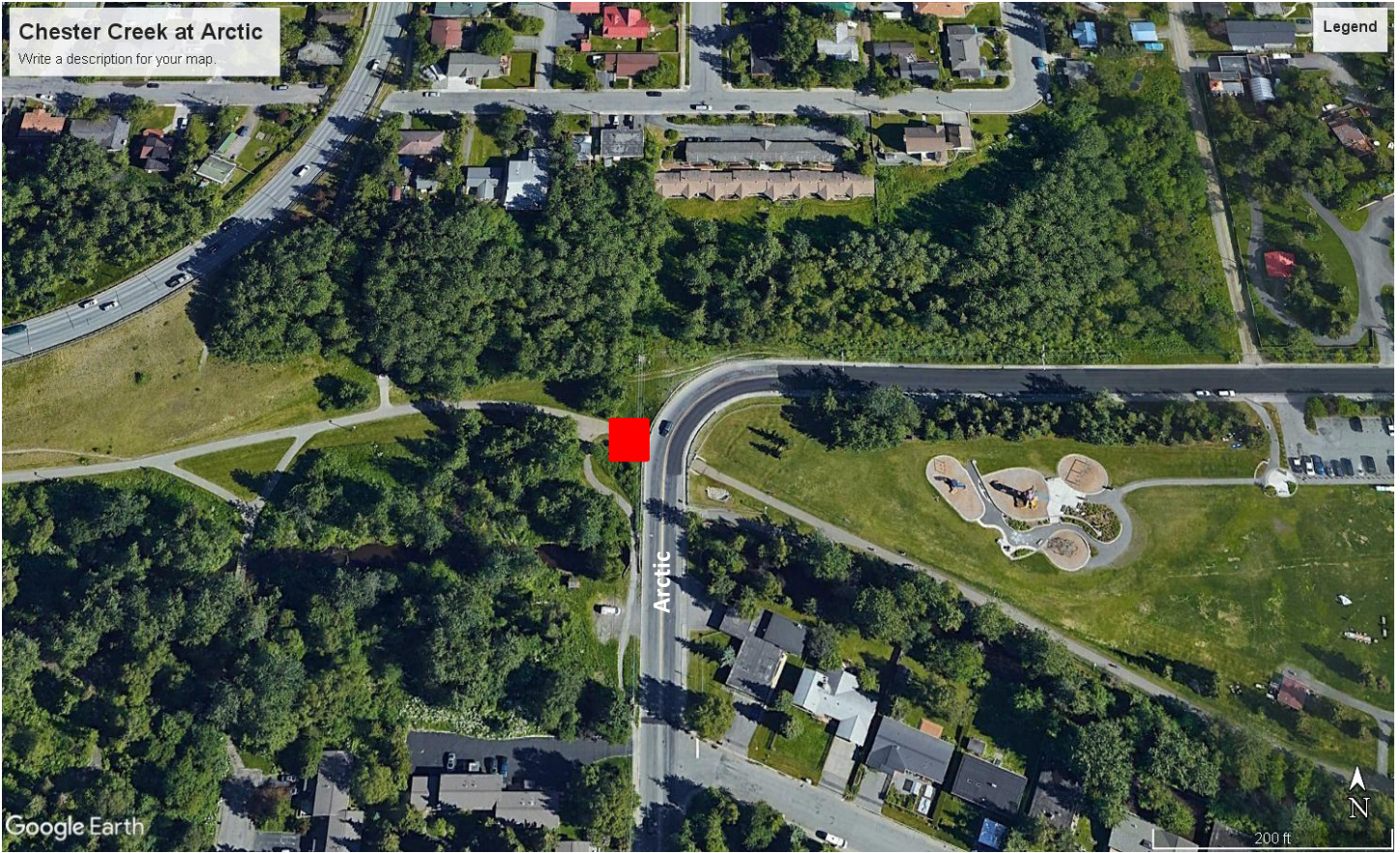
8. Main Stem Chester Creek at New Seward near 20th Ave and Kendall Ford. This is a major thoroughfare and should be marked.



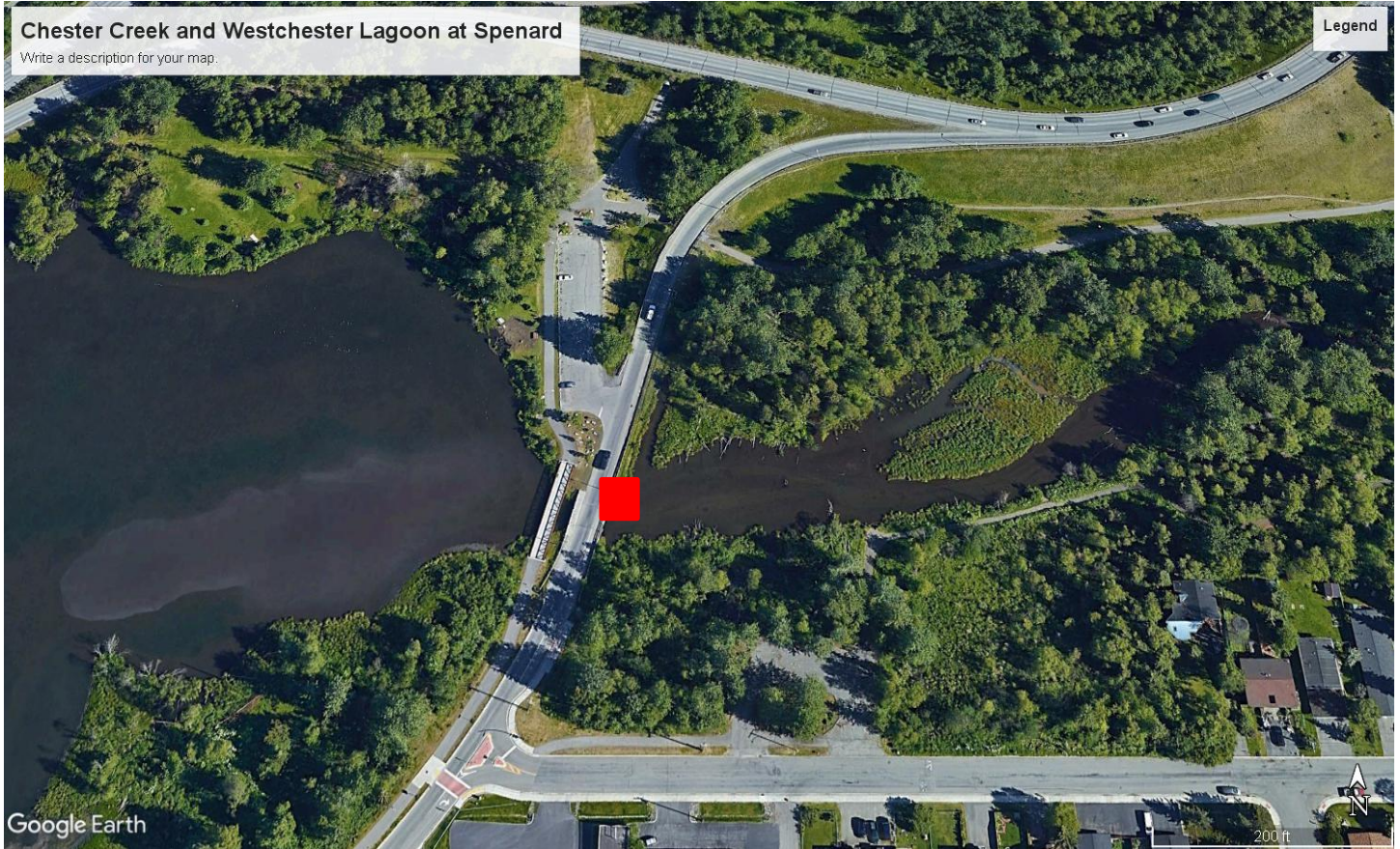
9. Chester Creek at A St. and C St. These are well-traveled routes with good creek signage.



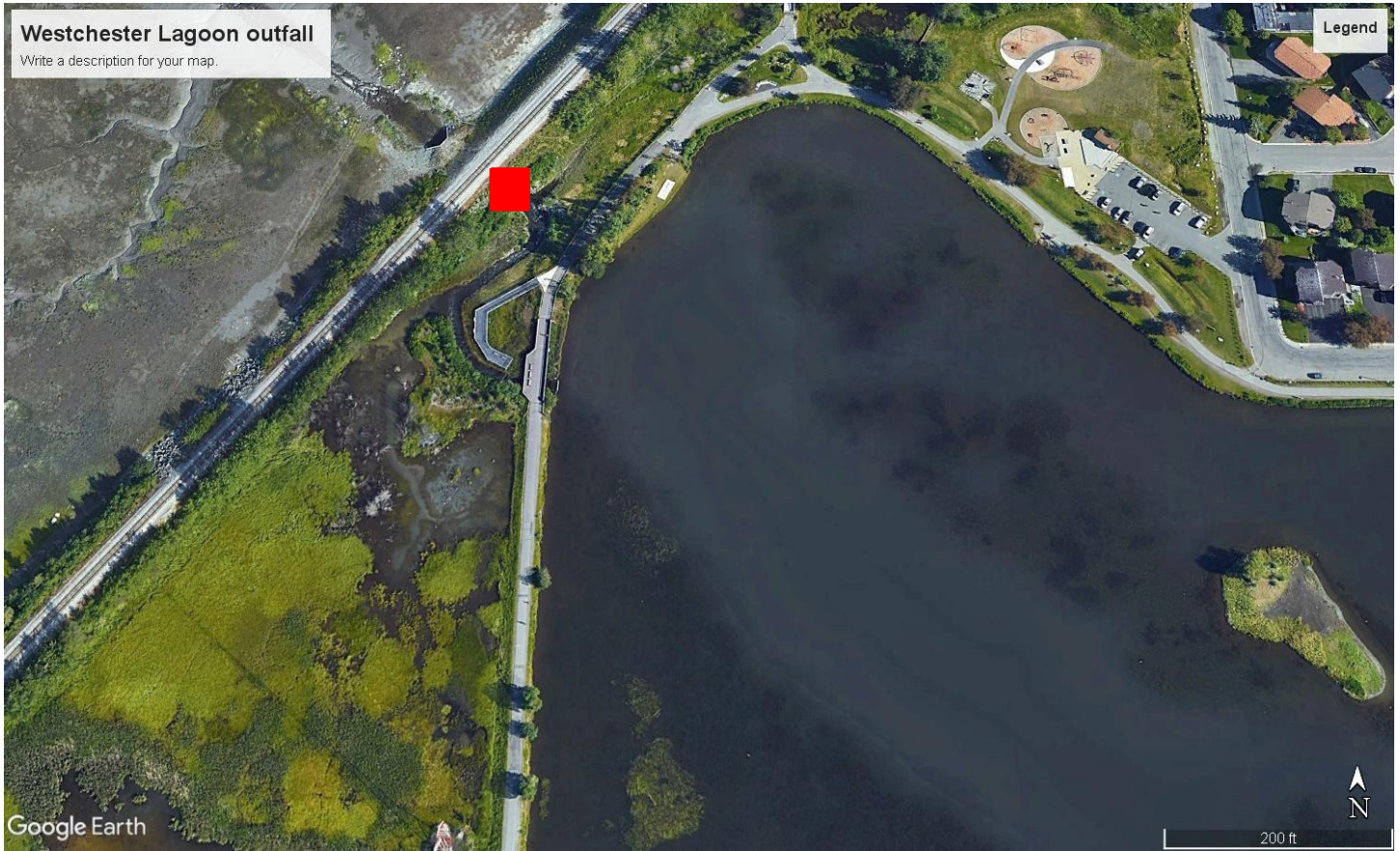
10. Main Stem Chester Creek at Valley of the Moon Park (17th and Arctic). This is an important area that is high usage, and creek awareness would be a good thing.



11. Chester Creek and Westchester Lagoon at Spenard Rd. This is a popular area for people to stop. To the west is Eastchester Lagoon a--a popular birding area.

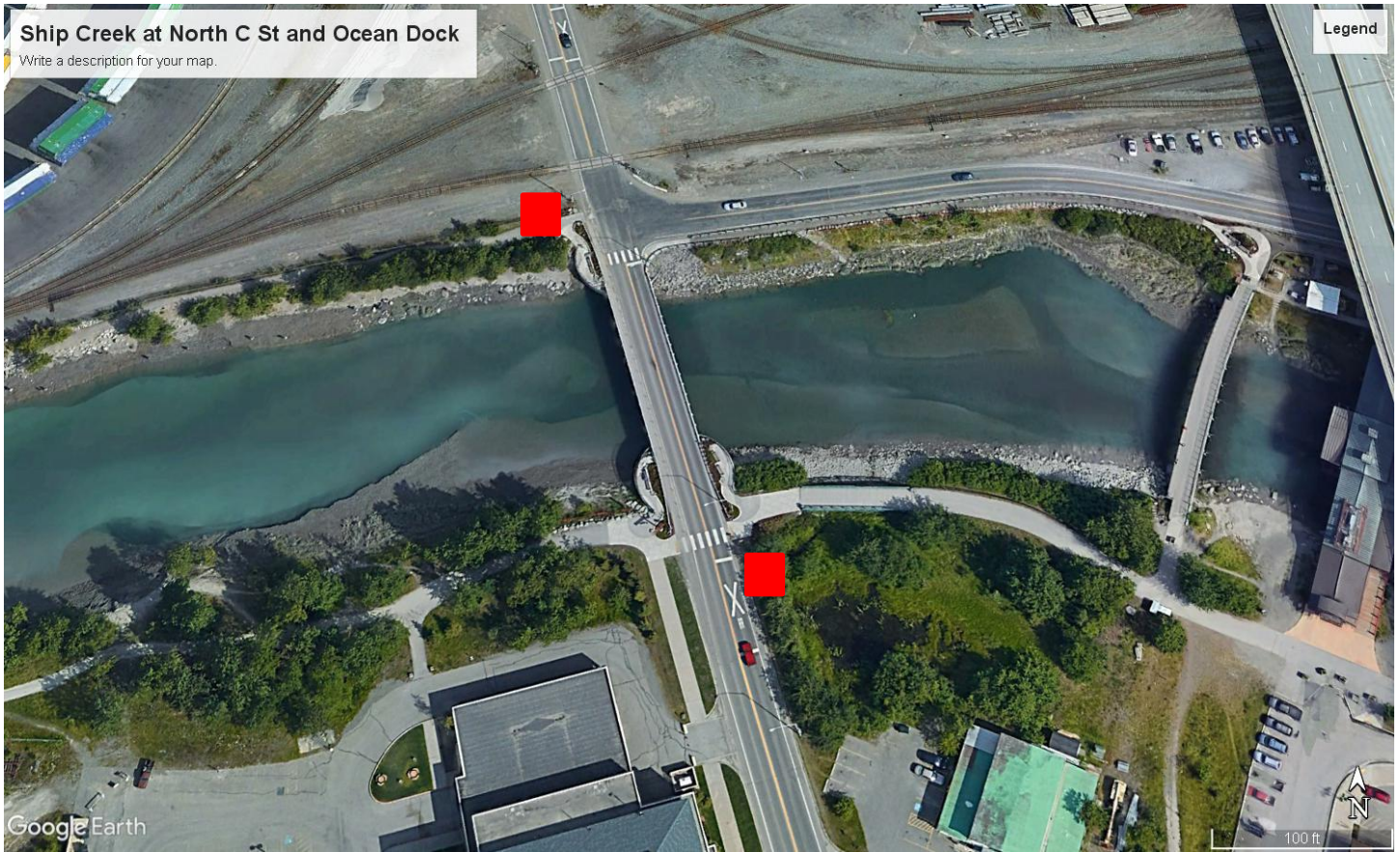


12. Chester Creek entering Knik Arm of Cook Inlet. The signs should be where Chester Creek flows under the Coastal Trail near the observation platform. There should be a sign that says Chester Creek on the observation platform.



Ship Creek

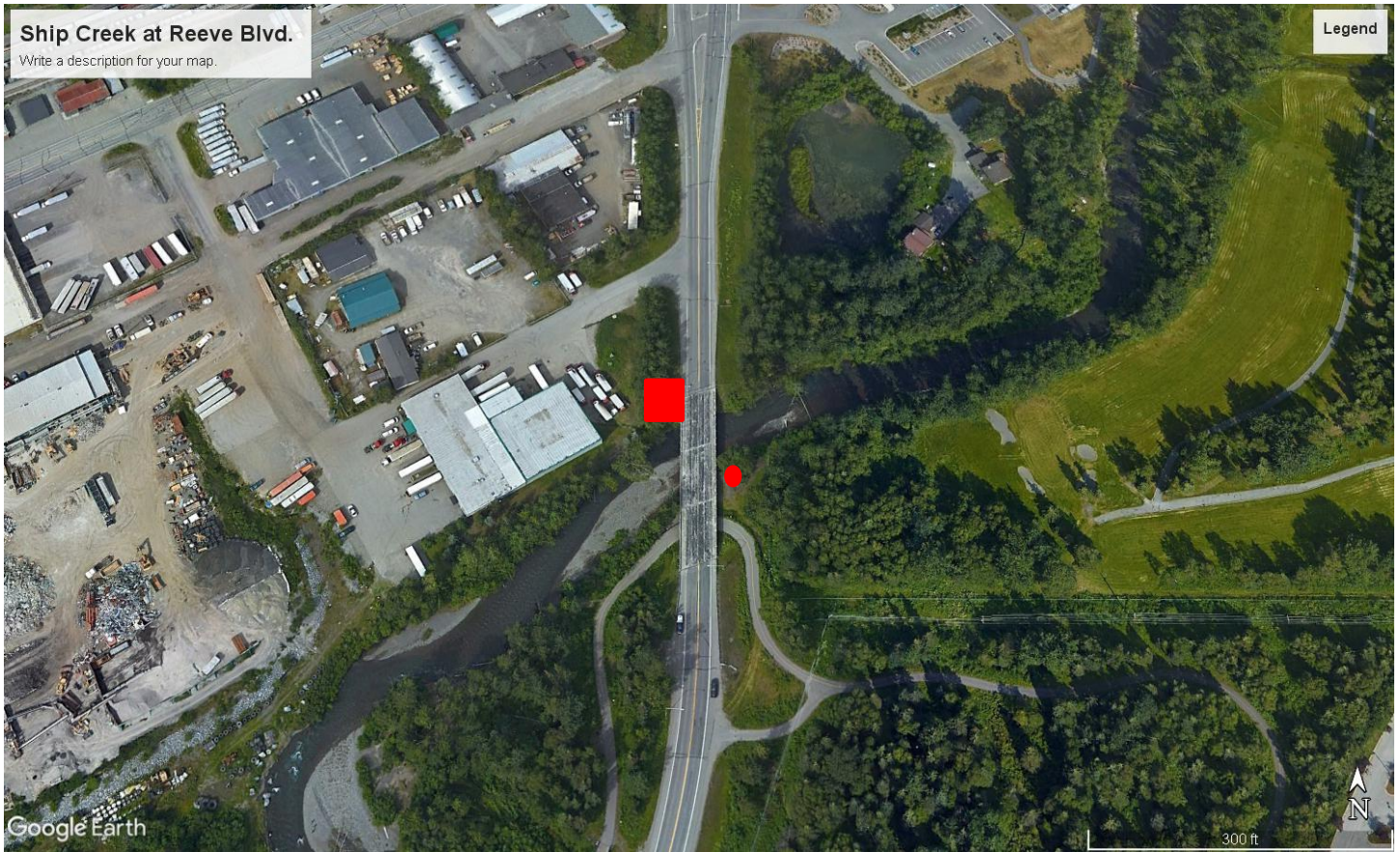
1. Ship Creek at N. C St. and Ocean Dock. This would be a great place for signage with all the fishing traffic. Most people know it's Ship Creek, but a sign would be nice.



2. Ship Creek at Post Rd. Largely an industrial area, this is a popular bike trail as well.



3. Ship Creek at Reeve Blvd. One sign heading north is there (below), one going south would be a good addition. The condition of the northbound sign is poor and could use replacing.



Animal Facility Report

Animal Facilities Report (2016-2018)

APDES Permit No. AKS-052558

By

Thomas Eley, Ph.D.
Anchorage Waterways Council

February 1, 2019



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Introduction

This report is to fulfill a sub-requirement in **3.0 “Minimum Control Measures”** of the Municipality of Anchorage’s 2015 ALASKA POLLUTANT DISCHARGE ELIMINATION SYSTEM (APDES) permit #AKS052558 which states in **3.3.3 Animal Facilities**, “[w]ithin three years of the effective date of this permit, MOA must evaluate the program implemented during the 2010 permit term to further regulate commercial animal facilities or other locations within the corporate boundaries of the MOA through ordinance or other regulatory mechanism to prevent animal waste from entering the MS4 and protect water quality. The evaluation must address kennels, pens, recreational facilities, stables, show facilities, or other commercial animal facilities currently regulated by the MOA, dog parks and the zoo.¹”

The task has been to develop a list of animal facilities and locations of high domestic animal usage in the Municipality of Anchorage (MOA), such as kennels/boarding, pet daycare facilities, pens, corrals, and stables; recreational facilities and trails; show and event venues; pet stores; groomers; dog parks; the Alaska Zoo; and other commercial animal facilities. This has been accomplished by interviews and onsite visits.

Part I. Anchorage Animal Care and Control (AACC)

Action items:

1. Work with AACC staff to obtain information on their multiple-pet licensing program requirements, staff visits and reports/complaints.
2. Look at permitting and requirements for other facilities listed above.
3. Review Anchorage Municipal Code in regard to animal regulations.

On 29 January 2016, Dr. Eley interviewed Officer Bradley Larson, MOA AACC Enforcement Supervisor, who was very gracious and helpful. Dr. Eley provided him with copies of the Goals and Actions for the evaluation of animal facilities. It was stressed that his help was needed and that we would work as partners through the process.

The majority of ordinances involving domestic animals are in Anchorage Municipal Code (AMC) Title 17 which defines an animal as all members of the Phylum Chordata, Subphylum Vertebrates, excluding nondomestic animals (wildlife) and humans. Even so, Title 17 only specifically addresses dogs, cats, rabbits, ferrets and horses. Animal control officers do, however, respond to complaints of cruelty, abuse, animal fighting, neglect and other issues for all species of animals. They have dealt with llamas (*Lama glama*), alpaca (*Vicugna pacos*), domestic goats (*Capra hircus*), domestic sheep (*Ovis aries*), domestic pigs and pot-bellied pigs (*Sus scrofa domestica*), guinea pigs (*Cavia porcellus*), hamsters (several species), gerbils (several species), mice (probably several species), donkeys or asses (*Equus africanus asinus*), and allegedly one mule (*Equus asinus* × *Equus caballus*), as well as various species of birds, reptiles and amphibians.

The following ordinances or parts of ordinances were discussed with Officer Larson:

17.10.010 -Animals in public places.

¹ anchoragestormwater.com/Documents/apdes/AKS052558_MOA_MS4_2015_FP.pdf. P. 25.

A. It is unlawful for any animal to be in a public place unless it is controlled by a leash, and in the control of a person competent to restrain the animal except:

1. Control of an animal by command is allowed if the animal is engaged in an activity that precludes it from accomplishing that activity if restrained, and the animal is in an area normally associated with that activity, and the activity is conducted in a manner that minimizes impact with the general public;
2. A dog may be unconfined in areas sanctioned by the municipality as off-leash dog areas. The owner or custodian of a dog, unconfined in an off-leash dog area, must have a leash restraint immediately available for the physical control of the dog and be physically capable of controlling the dog;
3. An animal, at shows and events, may be unconfined during the time of the demonstration in a manner which does not pose a threat to public health and safety or the safety of other animals;
4. An animal may be humanely attached in or to a vehicle in a public place, provided the animal may not: a. Be capable of removing or detaching itself from the vehicle; b. Be attached so as to fall, jump, be thrown from or dragged by the vehicle; c. Be exposed to prolonged inclement weather; or d. Pose a threat to public health and safety or the safety of other animals.
5. An animal may be humanely contained inside an attended or locked, fully enclosed container.

17.10.015 – Animals creating disturbance or nuisance.

B. No owner or custodian of an animal shall permit the animal’s feces to be left on public or private property. [This would include feces left behind by horses, cats, dogs with joggers or bicyclists, and dog teams.]

17.10.090 - Off-leash dog park spaces.

A. Notwithstanding any other provision of this Code, legally licensed dogs with current rabies vaccinations may be allowed, unleashed, in areas recommended by the animal control advisory board with concurrence of the parks and recreation commission and the mayor, subject to approval by the assembly. Such areas shall include but are not limited to designated areas within the following locations: University Lake Park; Far North Bicentennial Park (North Gasline Trail); Russian Jack Park (north side); Connor’s Bog; South Anchorage Sports Park (Future American Legion Trails); and Valley of the Moon Park².

B. Rules and regulations promulgated for the use of off-leash dog park spaces shall be posted and shall include the following:

1. Dogs must be leashed upon entering and leaving the off-leash dog park space.
2. Classified³ dogs and female dogs in heat are prohibited.

² In 2018, Whisper Faith Kovich became the 8th off-leash dog park in the MOA, however it does not appear to yet be in Anchorage Municipal Code (AMC) Title 17, 17.10.090, nor is Arctic Benson.

³ See AMC Title 17, Chapter 17.40, Regulations of animal behavior. 17.40.020 - Classifications and exceptions to classification of animals. At [muni.org/Departments/health/Admin/animal_control/Documents/Codified%20Title%2017%20\(54%20page%20PDF\).pdf](http://muni.org/Departments/health/Admin/animal_control/Documents/Codified%20Title%2017%20(54%20page%20PDF).pdf).

3. The owner or custodian of the dog must remain in the dog park space with the dog.
4. Dogs must be under control as defined in this chapter.
5. Dog feces must be cleaned up by the dog owner or custodian.
6. Holes dug by dogs must be filled by the dog owner or custodian.
7. Owners or custodians are responsible for all actions of their dogs.

C. Additional rules and regulations for each off-leash dog park space may be needed and will be recommended by the animal control advisory board with concurrence of the parks and recreation commission and approval by the director of the parks and recreation department and the chief animal control officer. Additional approved rules and regulations shall be posted.

D. It shall be unlawful for any owner or custodian of a dog to permit the dog to violate rules and regulations under AMC 17.10.090.

17.10.012 – Municipality of Anchorage cat identification required.

A. The owner or custodian of a cat over the age of four months shall maintain an identification worn by the cat at all times except:

1. When the cat is on the private property of the owner or custodian; or
2. When the cat, under control by leash or control by confinement, is either in a public place or on the private property of another.

B. Identification must be either a collar or tag which includes the current name, address and telephone number of the owner, or a microchip registering the owner.

17.15.010 - Municipality of Anchorage dog license required.

A. Any person who owns or has custody of a dog or wolf hybrid⁴ over the age of four months shall obtain a Municipality of Anchorage dog license for the dog or wolf hybrid except a dog brought into the municipality for less than 30 days.

17.15.050 - Municipal dog license tags and receipts.

A. A dog or wolf-hybrid shall bear a current Municipality of Anchorage dog license tag securely fastened to its collar, chain collar, or harness at all times except:

1. Any licensed dog or wolf hybrid while confined on the owner's or custodian's premises; or
2. While in competition, in training or while hunting.

⁴ **Wolf Hybrids:** Possession of wolf hybrids (AMC 17.60.010). No person shall own, possess, keep, maintain, harbor, transport, sell or advertise for sale any wolf hybrid within municipal boundaries except as provided under state law. Such possession of wolf hybrids is a criminal offense as set forth in AMC 8.55.070. Any person convicted of violating any provision of AMC 17.60, "Wolf Hybrids" with criminal negligence is guilty of a misdemeanor and may be punished by imprisonment for up to six months in jail or a fine of not more than \$2,000.00 or both.

17.15.060 - Special Purpose Licenses.

Three special purpose licenses are issued by AACC (AMC 17.15.060):

1. Animal litter license: Issued to a person who sells or reconveys not more than 3 litters of dogs or cats in a calendar year.
2. Multi-animal facility license: A person or facility, including a dwelling unit, residence, or business premise, that owns, possesses or is the custodian of four or more dogs, four or more cats, four or more rabbits, four or more ferrets, four or more horses or any combination of seven or more of the above animals, shall be required to obtain a multi-animal facility license: a. This section shall not apply to a person who has a single litter of dogs and/or cats that are not for sale and under the age of four months. b. This license shall be valid for two years from date of issuance.
3. Commercial facility license: A person or facility that boards or grooms dogs, cats, rabbits, ferrets, and/or horses for fees or services, or any person or facility that reconveys four or more dogs or cats in a calendar year, or any person or facility that breeds more than three litters of dogs and/or cats in a calendar year shall be required to obtain a commercial facility license. a. This license shall be valid for one year from date of issuance. b. A pet store is a commercial facility for purposes of this section.
4. Special Purpose License Facilities Summary: The following facilities are Special Purpose License Facilities:
 - An owner raising 3 or less litters of dogs or cats per year.
 - Home kennels with 4 or more animals or a combination of 7 animals. This would include dog teams.
 - Boarding kennels.
 - Stables that board horses or provide riding lessons.
 - Doggy daycare facilities.
 - Pet stores.
 - Pet groomers.
 - Commercial pet breeders.
 - Some rescue shelters.
5. Facilities Exempt From Licensing: Veterinarians, non-commercial stables (unless they fall into the multi-animal facility category), pet trainers, Alaska Zoo, Pooper Scoopers, and pet exercisers are exempt from the facility license requirement. Pet sitters are a unique category that may fall into the multi-animal facility or commercial animal facility category or in none of the categories, depending upon how the "sitting" is done. Licensing requirements do not apply to rescue groups approved by and registered with AACC.
6. Pet Waste Disposal: When an owner receives an Anchorage Animal Care and Control Special Purpose License Application, they receive a copy of the Municipality of Anchorage Waste Management Guidelines⁵. The

⁵ muni.org/Departments/health/Admin/animal_control/Documents/Animal%20Waste%20Guidelines.pdf

guideline lists the waste storage location setback distances from streams and surface waters as 25 feet.
(See Appendix 1)

17.15.090 Inspections.

A. The animal care and control center may inspect the premises and/or animals of all special purpose licensees annually or upon a public complaint. The animal care and control center may inspect prior to the issuance or renewal of a multi-animal or commercial facility license.

B. Special purpose license inspections:

1. A commercial facility, open to the public, may be inspected without notice during the times of normal business operations; or
2. A private residence may be inspected within 72 hours of notification to the resident of the intent to inspect. Such inspection shall be conducted between the hours of 8:00 a.m. and 8:00 p.m.
3. Inspections shall be conducted by animal control officers and/or a licensed veterinarian trainee to examine all animals in the facility.

Inspection Coverage:

Animal control officers or veterinarian trainees conduct all inspections. The inspection ensures that the facility meets Title 17.10.050.

17.10.050 - Standards for operating animal facilities.

A. An owner or operator of a multi-animal facility, commercial facility, or any other facility associated with keeping of domestic animals for which a permit is required, as specified under chapter 17.15 and any other municipal regulations, shall:

1. Provide adequate and appropriate shelter to ensure animal health, safety, and welfare.
2. Maintain the facility in a sanitary condition (guidance for applicants on the disposal of animals are attached as Appendix 1.)
3. Provide veterinary care as necessary.
4. Provide for adequate and appropriate care and feeding of animals and ensure the availability of adequate food and fresh water.
5. Ensure no animals prohibited by federal, state and municipal laws are kept.
6. Ensure all animals are confined or in control on any premises where the animals are kept.
7. Keep only the number of animals in the facility or on premises which allows for appropriate space, safe keeping, humane care and sanitary environment consistent with the animal's breed, size, age, and species for all animals kept.
8. Comply with the provisions of this title, municipal regulations, and the terms, conditions and limitations of any license issued under chapter 17.15.090. Comply with the provisions of Title 21 (Land Use Planning) of this Code.

Complaints to AACC

According to Officer Larson, the four most common complaints are:

1. Chronic animal noise: barking, and other disturbing noises that animals might make.
2. Animal feces on trails, in parks and in individual's yards. This is a constant complaint of all trail and park users. However, some of the worse places are the parking lots and trails leading to off-leash dog parks. People get out of their vehicle, let their dogs run unleashed [after all we're going to an off-leash park] around the parking lot and the trail where the dogs often defecate. This is a violation of the off-leash park rules. People don't seem to clean up these areas with any vigor.
3. The smell of feces or horse manure, which is generally the result of failure to clean up yards or paddocks and barns. However, the smell of feces and urine goes away during the coldest part of the winter, yet when the melt begins the smell, even though cleanliness has been maintained, returns.
4. Too many animals at a facility: usually this complaint is made by someone whose neighbor has more than 3 animals on their premises. More often than not, the person making the complaint doesn't understand that the individual has a multi-animal permit.

Other complaints include:

1. Occasionally, there will be a complaint against a specific boarding kennel or dog groomer, but they are not common. These complaints are often complex and time consuming.
2. Loose or stray dogs.
3. Vicious dogs
4. Animal cruelty cases.
5. Neighborhood feuds: Where neighbors are feuding over some issue and will call various agencies (Code Enforcement, Animal Control, etc.) in retaliation for some aspect of the feud.

Review of Animal Ordinances in Other Cities of Similar Size

The animal control ordinances of 15 cities approximately the size, as well as some larger and some smaller, of the Municipality of Anchorage were reviewed and compared to AMC Title 17 Ordinances (Table 1). Most of the cities combine all animal ordinance and issues under one title while Anchorage has animal issues addressed in Titles 2, 4, 7, 8, 9, 11, 14, 15, 16, 17, 21, 25, 26, and 27.

Title 17 is in line with ordinances from other cities with a few differences in numbers and kinds of animals that can be possessed, fine and fee schedules and administrative processes. Most cities address all animals in their ordinances: dogs, cats, ferrets, caged birds, domestic birds, chickens, turkeys, ducks, geese, swans, goats, sheep, horses and ponies, cattle, alpaca and llama, camel, kangaroos and wallabies, ostriches, rheas, emus, wild animals as pets (permitted in some states), reptiles, and amphibians. Interestingly, most cities allow and regulate pigmy goats, pigmy sheep, miniature horses, and Vietnamese pot-bellied pigs below a certain weight and length.

Several ordinances prohibit the releasing of any pet (one ordinance includes the dumping of aquarium fish and plants) into the wild where it could become a feral or invasive species. This provision would be a good addition to Anchorage's Title 17 or Title 21.

Table 1. Cities where animal ordinances were reviewed.

City	Population
Anaheim, CA	336,268
Bend, OR	76,639
Boise, ID	392,365
Denver, CO	600,158
Eugene, OR	156,185
Fresno, CA	494,665
Long Beach, CA	462,250
Oakland, CA	397,245
Portland, OR	581,485
Salem, OR	130,398
Santa Ana, CA	324,528
Seattle, WA	608,660
Spokane, WA	208,916
Tacoma, WA	198,397
Walla Walla, WA	31,731

Because Title 17 only addresses dogs, cats, rabbits, ferrets and horses, there is no guidance on ownership provisions for other animals, such as sheep, goats, cows, pigs, llamas, alpacas, rabbits (including feral rabbit populations), chickens, turkeys, domestic ducks and domestic geese, that are found in Anchorage. It has been suggested that the covenants for subdivisions be reviewed, but many residents don't have a copy of them. Additionally, owners of newer houses built in the subdivision or adjacent to the subdivision are not covered under the covenants. Others contend that covenants expire after a period of time.

AMC Sec.21.05.050 discusses large domestic animal facilities, which harbor four or more "large domestic animals." Large domestic animals are not defined, although horses and equestrian activities are mentioned later in this section.

Other requirements. Large domestic animal facilities shall:

- (A) Meet the requirements of AMC Chapter 15.20 regarding animal waste; AMC subsection 15.55.060 B., concerning separation requirements from water supply wells; and AMC Section 21.07.020 concerning stream protection setbacks.
- (B) Obtain an animal control facility license.
- (C) Obtain certification of compliance with a state of Alaska, Anchorage Soil and Water Conservation District conservation plan, or obtain a letter of intent from the district showing demonstrated intent to come into compliance with a conservation plan within one year; and
- (D) Comply with licensing and other laws concerning the keeping of animals as set forth in AMC Titles 15, 17, and 21.

Additional Conditions:

The planning and zoning commission may impose additional conditions upon a conditional use permit that are found necessary to protect any person or neighboring use from unsanitary conditions or unreasonable noise or odors, or to protect the public health and safety.

AMC Sec.21.05.070 (Accessory Uses and Structures) states that “up to five animals may be kept on lots of 6,000 ft² (0.14 acres) or less with an additional one animal per additional 1,000 ft². It is unclear whether the five animals on lots of 6,000 ft² or less applies just to outside animals or animals kept primarily in a residence. Further, the title states, “One to three large domestic animals may be kept outdoors on lots of 20,000 ft² [0.46 acres] or greater...” Clarification as to what is the minimum size lot that a horse can be kept on and whether a large domestic animal includes miniature horses, pigmy goats, goats, alpacas, llamas, sheep, and pigs, would be helpful.

Anchorage Animal Care and Control Licenses - 2018

As of 1 December 2018, AACC had 211 active “kennel” or commercial licenses (Table 2). Each of the categories of licenses is discussed in AMC 17.15.060 - Special Purpose Licenses. These 211 licenses do not include current licenses in the renewal process or entities filing for their licenses. It was also found that some folks were operating under what should be a Commercial License but elected, in violation of AMC Title 17, to not get a license. People selling puppies and kittens as well as “keeping a horse for a friend” with money paid under the table are the biggest offenders. It is a major endeavor of AACC to locate these individuals. There will be more discussions on stables later in this report.

Table 2. Active AACC Licenses, 12/1/2018 (n=212)

License Type	Number (%)
Mushing 4-10 Dogs	9 (4.2%)
Mushing 11+ Dogs	13 (6.1%)
Commercial License (Stores & Puppies)	32 (15.0%)
Commercial License (Stables)	12 (5.8%)
Home Kennel 11+ Dogs	21 (10.0%)
Home Kennel 4-10 Dogs	125 (58.9%)

AACC does not break down stables as a separate category, but they have been separated out due to the nature of this study. More stables appear to exist in the MOA than the 12 with licenses although a complete count could not be ascertained.

Official Inspections of Facilities

Facility inspections are mandated by AMC 17.15.090 and are conducted by animal control officers or veterinarian trainees. Mushing and Home Kennels are inspected before issuance of the license and upon renewal. They can also be inspected anytime during normal business hours and with a notice of the inspections. These inspections are usually due to a complaint or concern. Dr. Eley and Dr. Northon experienced a Home Kennel (4-10) inspection. The inspection was conducted by an AACC officer. We found that it was thorough and

helpful to kennel or facility owners. The officers point out things the owner might not have noticed and provide particularly helpful tips. The inspection focused on the general area for the number of dogs; storage of dog food so as not to attract bears, rodents and other “vermin;” and potential complaints about the licensees’ pets (barking, aggressiveness, interactions with AACC). A significant amount of time was spent on how wastes should be disposed.

Commercial License facilities are inspected before issuance of the license; once a year unannounced; anytime unannounced during normal business hours if there is a concern; and upon renewal of the license. Approximately 150 inspections are done annually which equates to approximately 1 inspection every other day. The inspections last approximately 1 to 1.5 hours or more for a large facility. Afterwards the paperwork must be completed and approved. This is a considerable time commitment for an organization that is under-staffed as it is.

Part II. Anchorage Water and Wastewater Utility (AWWU) and Their Industrial Pretreatment Program Standards in Regard to Animal Facilities

Mr. Chris R. Kosinski, Public Affairs, Anchorage Water and Waste Water Utility provided the following answers to my email of 4 January 2016:

- AWWU does not specifically address animal facilities with standards for discharge, other than the applicable prohibited discharge standards codified and listed in Anchorage Municipal Code 26.50.050⁶ (See Appendix 2 for “Prohibited Acts”).
- 26.50.050 - Prohibited acts.
 - A. It shall be unlawful for any user to:
 - Discharge or cause to be discharged any of the following described pollutants, substances, or wastewater into the municipal sewerage system:
 - Any solid or viscous substance, or liquid that can become viscous when cooled, in amounts capable of causing obstruction to the flow in sewers or other interference with the proper operation of the sewerage system such as, but not limited to, fat, grease, uncomminuted garbage, animal guts or tissues, hair, hide, fleshings or entrails.

Question by researcher Dr. Eley to Mr. Kosinski: *Do wastes from animal facilities, vets' offices, etc. receive any special treatment by you folks or does it just go down the drain with the rest of wastes.*

- “No special treatment requirements, unless discharges resulted in blockages, in which case pretreatment would recommend use of best management practices to prevent sewer blockages (i.e., dispose of animal hair to solid waste, install floor drain screening devices, etc.)” Mr. Kosinski’s reply (email 5 January 2016).

⁶ At awwu.biz/home/showdocument?id=258.

Part III. Facilities and Event Locations and Maps Showing Proximity to Waterbodies and Other Pertinent Features that Would Impact Stormwater Runoff

Seven maps are attached in Appendix 5 to fulfill this requirement. They include:

- Map 1. Off-Leash Dog Parks and Mutt Mitt Stations, Anchorage
- Map 2. Anchorage Animal Venues
- Map 3. Chugiak and Eagle River Animal Venues
- Map 4. Commercial Stables, The Alaska Zoo, and Trails in Anchorage
- Map 5. Commercial Stables in Chugiak and Peters Creek
- Map 6. Indoor Animal Facilities and Pet Stores - Anchorage
- Map 7. Indoor Animal Facilities and Pet Stores - Peters Creek, Chugiak, and Eagle River

Between 2016-2018, 66 animal facilities and 14 animal venues (Appendix 4) were checked out⁷ during the course of the project. All eight off-leash dog parks (Table 3) were visited. Sadly, despite these designated dog parks, many other MOA parks, greenbelts, ball fields, and school grounds are being used as off-leash areas, where little attention is given to cleaning up pet wastes.

Six animal services facilities, AACC, Humane Society, Alaska Society for the Prevention of Cruelty to Animals (ASPCA), Bird Treatment and Learning Center, the Alaska Zoo, and all three pet rest areas and waste stations at the Ted Stevens International Airport, were visited as well.

All the known permanent venues for animal events (Table 4) were inspected and found to be clean after events. Several MOA parks have had animal events, but not on a continuing basis. Other MOA parks were visited as they are potential animal venues or are used as Off-leash.

Thirteen licensed stables were checked (Appendix 4). Some concern exists about the disposal of animal wastes at horse event venues, stables, and an urban farm as well as by horses on trails. Horse event venues, stables and the one urban farm contend that their wastes are taken to the Municipal Landfill or given to people who want the wastes for their gardens. According to Title 17, the wastes from horses on trails should be cleaned up.

Sixty-six of 81 (81%) indoor animal facilities (doggy daycares, groomers, boarding kennels and pet stores that have on-site training, daycare, or grooming) were examined. Many of these facilities (Appendix 4) were not in business or not possessing or renewing licenses on 1 December 2018. With the exception of one kennel which was the subject of several lawsuits in 2016-2017, all facilities were clean and disposed of their wastes via Solid Waste Services, Alaska Waste, or other commercial waste haulers and AWWU. One kennel composts its waste. The kennel that was under litigation has now changed ownership from Coshok's Canine Castle to Southpaw Kennels, and the facilities have vastly improved. Although veterinary clinics are exempt from inspections as their wastes go down the Municipal sewer system, one veterinary clinic was visited to see its operation.

⁷ Many of the licensed animal facilities are residential kennels and dog yards. These were only viewed from their exterior. Non-residential facilities were visited.

Thirty-two commercial (non-residential) facilities are shown on Map 6. Approximately one-third are located adjacent or very close to a creek. It would be prudent to review these locations frequently to make sure they are not contributing to high fecal loads in the creeks.

A. Off-Leash Dog Parks: The watersheds for the eight Off-Leash Dog Parks⁸ are shown in Table 3. All off-leash dog parks have pet waste stations in the park or at the trail heads. Unfortunately, folks using the parks are doing a poor job of cleaning up after their dogs. Information available to Off-Leash Dog Park users by AACC is shown on p. 16. While two of the parks are located on a creek (University Lake on the South Fork of Chester Creek and Valley of the Moon Park on Chester Creek), others are some distance away, yet all have stormwater drainage to their particular creek. Thus, all of the Off-Leash Parks are potential sources of *E. coli* to the creeks and watersheds listed in Table 3.

Watching people’s behavior at the parks yielded some interesting observations. About half of the people pick up after their dogs, and these are usually people who are actively interacting with their dog. The other half do not clean up after their pets. Many dog owners just turn their dog(s) loose in the park and pay no attention to it or what it is doing. Some dog owners stand around in big groups talking and are oblivious to the dogs unless there is a fight. Many are on cells phone and focused on their conversation and not on their pets. Fortunately there are some volunteers who spend their time cleaning up the parks on a regular basis.

Park	Watershed	Location
Arctic/Benson Park (Fenced Area)	Fish Creek	Stormwater to Fish Creek
Connor’s Bog Park	Campbell Creek & Fish Creek	Stormwater to Lower Campbell Creek & Connor’s Lake
Far North Bicentennial Park - Gasline Trail only	Campbell Creek	South Fork of Campbell Creek
Russian Jack Park	Chester Creek	South part of the Park is located on the Middle Fork of Chester Creek & north part is stormwater drainage into the Middle Fork
South Anchorage Sports Park ⁹	Campbell Creek	Stormwater drainage to Campbell Creek
University Lake Park	Chester Creek	On South Fork of Chester Creek
Valley of the Moon Park (Fenced Area)	Chester Creek	Next to Chester Creek
Whisper Faith Kovach Park ¹⁰ (Fenced Area)	Little Campbell Creek	Stormwater to S. Fork Little Campbell Creek

⁸ Gasline Trail in Far North Bicentennial Park is the off-leash area as opposed to the entire park. Regardless, dogs are off-leash in much of the park.

⁹ South Anchorage Sports Park Dog Park was field checked by Dr. Eley on 12 January 2018 and is finished. Good signage at the dog park, pet waste stations in place, trash cans, etc. Signage directing people to the dog park was absent, which resulted in pet owners using other areas of the park for their dogs (off-leash in on-leash areas). Signage to be in place in Spring 2018

¹⁰ This park was opened in Summer 2018 with a playground for children and two fenced dog parks—one for large dogs and one for smaller dog. It has been called the “Flagship” of dog parks.

Figure 1. MOA AACC website page on Off-Leash Dog Areas
 (At muni.org/Departments/health/Admin/animal_control/Pages/dogparks.aspx)

Animal Care & Control

Health and Human Services

Animal Care and Control

Adopting a Pet

Lost Pets

Licensing Your Dog

Owner Surrendering Pets

Animal Bites

Animals and Disaster Preparation

Barking Dogs

Donations

Education and Outreach

Employment

Forms and Brochures

Foster Program

Licensing Your Animal Facility

Off-Leash Dog Areas

Leash Law

Scoop the Poop

Shelter Reading Program

Spaying and Neutering

Trapping Loose Domestic Animals

Vaccinations

Volunteering

Animal Control Advisory Board

Animal Control Hearings Office

Animal Care & Control Annual Statistics

Off-Leash Dog Areas

A number of areas within municipal parks have been established for off-leash dog activity in Anchorage. The designated areas are within the following locations:

- University Lake Park
- Far North Bicentennial Park (North Gasline Trail)
- Russian Jack Park
- Connors Bog
- South Anchorage Sports Park (Fenced with separate areas for large and small dogs)
- Valley of the Moon Park (Fenced Area)
- Arctic Benson Park (Fenced Area)
- Whisper Faith Kovach Dog Park (Fenced with separate areas for large and small dogs)

Off-Leash Dog Areas - Rules and Regulations

- Dogs must be legally licensed and have a current rabies vaccination.
- Dogs must be leashed upon entering and leaving the off-leash dog areas.
- Classified dogs and female dogs in heat are prohibited.
- The owner or custodian of the dog must remain in the dog area with the dog.
- Dogs must be under control as defined in Title 17.
- Dog feces must be cleaned up by the dog owner or custodian.
- Holes dug by dogs must be filled by the dog owner or custodian.
- Owners or custodians are responsible for all actions of their dogs.

Additional Rules and Regulations for Specific Areas

Connor's Bog

- Off-leash activity shall be restricted to the designated area once ski-joring trails are groomed.

University Lake

- Specific trails within this park may be closed to off-leash use on a seasonal basis. Such trails will be clearly posted.

Good Petiquette

Areas designated for off-leash dog use are shared by many park users including skiers, walkers, runners, bikers, and others. Because these areas are truly multi-use, it is important to exhibit courteous behavior or "good petiquette". There are some simple things that can be done to make off-leash areas enjoyable for all users including:

- Always carry a leash (if you need it, you have it).
- Bring poop scoop bags from home to clean up after your pet. Please help by picking up extra. Even responsible dog owners get distracted.
- Keep you dog in sight and under control at all times.
- Control excessive barking.
- Off-leash areas are shared for a variety of activities so please be respectful of other users. Keep your dog controlled and from interfering with other people and their dogs (especially leashed ones).
- Properly dispose of all garbage in cans or take it home with you.
- Remember, you are fully responsible for your dog and his actions.

Health and Human Services Divisions

- Administration
- Cemetery
- Community and Family Health Division
- Housing and Community Services

Related Links

- [Pet ID Video "ACATamy Award"](#)
- [Pet Spay or Neuter Video "Get Real"](#)
- [Pet Licensing Video "Bling"](#)
- [Pet Licensing Video "Let's See Some ID"](#)
- [Municipal Animal Law \(Title 17\)](#)
- [AO Title 17 Revisions for Public Comment](#)

Dog Parks

- [Urban Dog Etiquette \(Adobe pdf\)](#)
- [Far North Bicentennial](#)
- [University Lake](#)
- [Russian Jack](#)
- [Connors Bog](#)
- [South Anchorage Sports Pk](#)
- [Valley of the Moon Park](#)
- [Arctic Benson Park](#)

There appears to be some confusion at a few of the parks as to where the off-leash areas are. At University Lake Dog Park there is an assumption that the entire area is considered off-leash, but that's not the case. In 2016 a University Lake Park Master Plan was begun which was adopted in 2017 by the MOA Assembly. Figure 2 is a map from the planning document that shows the designated uses for trails: paved on-leash, soft on-leash, and soft off-leash. Large portions to the south and east are supposed to be on-leash, but that is not what happens in the park. It is hoped that as the plan is implemented, more signage will help make these separate uses more clear. However, since the entire park has been used for years as off-Leash, it's not too likely that this will change.



Figure 2. 2016 University Lake Park Master Plan map showing On and Off-Leash areas
 (At muni.org/Departments/parks/Pages/UniversityLakeParkMasterPlan.aspx)

Connor's Bog is another park where off-leash areas are not clear. On the MOA Parks and Rec page for dog parks, the link shows the map in Figure 3. The park has specific regulations that apply to two areas when the ski trails are groomed. Unfortunately, the signage at the park in Figure 4 (checked again on 2 January 2019) only shows the overall park with no restrictions during winter.



Figure 3. Parks and Rec web map as of 4 January 2018 showing the outline of Connor's Bog park and the restricted areas when the trails are groomed.
(At muni.org/Departments/parks/PublishingImages/Off%20Lease%20Dog%20Park%20Areas/Connor%27s%20Bog%20Off-leash%20Area.pdf)



Figure 4. Connor's Bog Park Map showing the outline of the park and trails, but with no indication that there are restrictions when the trails are groomed. (Photo by C. Northon, 2019)



Figure 5. Sign from Connor’s Bog Park with Off-Leash Dog Park regulations according to AMC 17.10.090, but with no mention of any seasonal restrictions (Photo by T. Eley, 2019)

Additionally, in the same area, there is the sign indicating that you are on Ted Stevens Anchorage International Airport (Figure 6) and wishing people to “enjoy the trail”. Park users have no idea what this means to them or that they are actually in the airport’s “crash zone.” It does beg the question as to whether or not this is a Municipal Park or part of the Anchorage International Airport.



Figure 6. Ted Stevens International Airport sign at Connor’s Bog Park (Photo by T. Eley, 2019)

One clarification that needs to be dealt with is where the South Anchorage Sports Park Off-Leash Dog Park actually is. Figure 7 from the Parks and Rec website shows an area with “Improvements anticipated summer 2016”. This is where the new off-leash area is, which has been completed and functional for at least a year. As of 2 January 2019, there still was no signage in the park directing users to the off-leash area. For years, pet owners have used all areas of the park as witnessed by the excessive amount of pet waste found throughout the entire park during Scoop the Poop Days and in 2016 when youth employment in parks (YEP) cleaned up the animal wastes in the park. The new playground (former high-use off-leash) has signage about keeping dogs on leash as well as two pet waste stations and trash cans, but neglects to direct people to the off-leash areas.

Another recommendation would be to remove the sign (Figure 8) that warns “unauthorized motor vehicles” not to proceed further, because this is the only road to the off-leash area and place directional signage near the park entrance to direct off-leash users to the north end of the park where there are two very nicely fenced pet areas complete with pet waste stations.



Figure 7. MOA Parks and Rec web map of South Anchorage Sports Park
(At muni.org/Departments/parks/PublishingImages/Off%20Lease%20Dog%20Park%20Areas/SASP%20Off-leash%20Area.pdf)



Figure 8. Sign posted at the South Anchorage Sports Park on the road leading to the off-leash dog park (2016)¹¹
(Photo by T. Eley, 2016).

Unfortunately, enforcement of on-leash usage areas and those not picking up their pet's waste is difficult with so few officers and so many parks and other areas. Officers are aware of the importance of cleaning up pet wastes, but vicious dogs, dog bites, loose dogs, and barking dogs take up most of the officers' time. Further, Anchorage Animal Care and Control serves the entire Municipality of Anchorage, from Girdwood to Eklutna. An anecdote that Officer Larson mentioned was about an officer who had parked at University Lake to do some paperwork, and while there he witnessed a woman get out her car with a dog who pooped in the parking lot. She went into the park and later returned to leave without picking up after her pet. She was cited by the officer, but those are pretty random opportunities.

Over the past several years, Anchorage Waterways Council staff have visited many of the MOA parks, greenbelts, and trails. It is sad to report that essentially almost all of these are being used as off-leash dog areas and minimal effort is put forth to clean up dog waste by pet owners. Some users are bicyclists, runners, X-country skiers, and ski-jorers who move fast along the trail and don't notice what their dogs are leaving behind. Many school yards and ball fields are also used as off-leash parks with little to no waste cleanup.

For some reason, many dog owners don't seem to feel responsible for disposing of their pet wastes. Some have even voiced the opinion that they pay taxes so the Municipality should clean up the wastes, or they think that pet waste is a fertilizer. Others may assume that AWC's Scoop-the-Poop Days (one day a year at 2-3 parks) will clean up the wastes, but isn't even a drop in the bucket. The goal of Scoop-the-Poop Day is mostly to highlight the problem of pet waste. Fortunately, some responsible pet owners/walkers not only clean up after their dogs often as well as after others.

¹¹ The sign was field checked and confirmed again on 2 January 2019.

During Scoop the Poop meetings, different BLM staff have expressed frustration about off-leash dogs in all areas of Far North Bicentennial Park when only one trail area is designated as such (Figure 9). Despite continuous attempts to educate the users about the different use areas, little has changed.

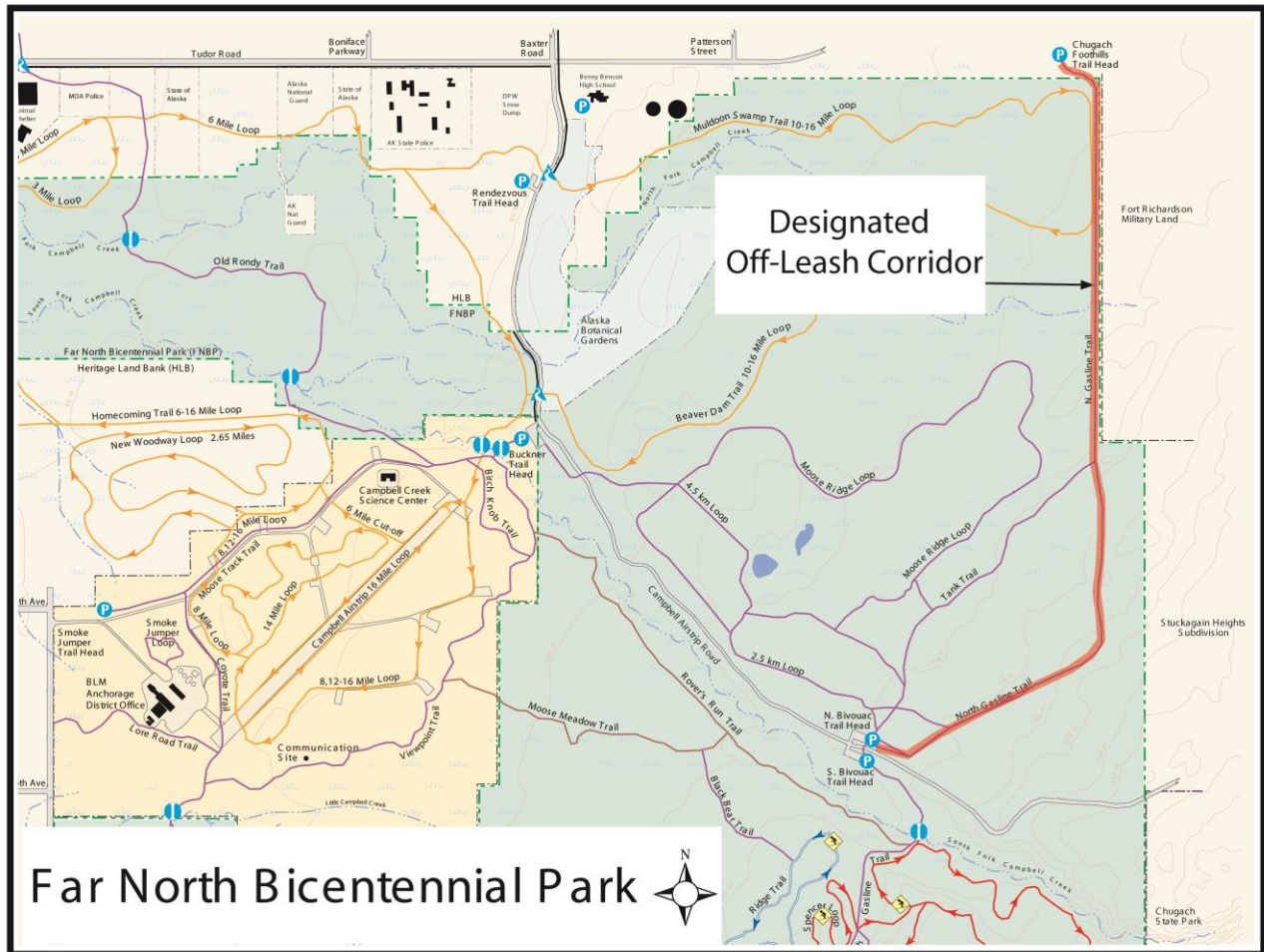


Figure 9. Far North Bicentennial Park map showing the designated off-leash area¹²

An issue that has surfaced at the Campbell Creek Estuary Natural Area (CCENA), which is not an off-leash dog park, is that it is being used as one. In fact, signs posted there state that no dogs are allowed at all. This is especially troubling because of the sensitive nature of the area. Volunteer docents report that there is regular use of the area by people with their dogs, and, as with most dog-use areas, pet waste is frequently left in the area. Friends of the Anchorage Coastal Wildlife Refuge (FARAK) is a non-profit that worked diligently with the Great Land Trust (GLT) and other partners to get this 60 acre parcel designated with a Conservation Easement. FARAK is currently spearheading adoption of a formal ordinance (AO 2019-XXXX¹³ CCENA Dog Animal Prohibition) stating no dogs are allowed there. AWC supports this ordinance, although it is likely that enforcement will then become the problem.

¹² At trailsOfAnchorage.com/Maps/FNBPTailMap.pdf

¹³ The final Anchorage Ordinance number is pending.



Figure 10. "No Dogs" Sign at the trailhead of CCENA (Photo by C. Northon, 2018)

B. Airport Pet Waste Stations: The Anchorage International Airport has three pet waste stations adjacent to the terminals for people traveling with their pets. These areas have waste disposal bags, garbage cans, and “fire plugs.” Signage concerning the disposal of pet wastes is also present.

Environmental Manager Scott Lytle wrote to Dr. Eley on 30 March 2016:

Thom,

We have bags at the airport pet stations. We usually do cleanup of the areas, but not on a routine basis. Monitor and do as needed. In winter, when we have snow, things get overlooked until spring time due to staff handling snow and other things.

There are no indoor areas for pets, either pre or post security. Have had talks but no desire to do it at this time. I have seen some people use the piddle pads and then toss in garbage at boarding gate areas. We also get 'accidents' that our Facility Maintenance responds to.

Around Lake Hood and Spenard, we have three bag stations with garbage cans next to them. The one on north side by gate gets used the most.

Thanks,

Scott Lytle - Environmental Section

Ted Stevens Anchorage International Airport

907-266-2129

Dr. Eley has visited the airport’s pet waste stations several times, and they always appear clean and in good order. The stormwater runoff from these stations enters the stormwater system and not the sanitary sewer system. There are three watersheds, Hood, Fish, and Campbell, that receive stormwater from Anchorage International.

C. Venues: The venues for major animal activities in the Municipality of Anchorage are shown in Table 4 and Maps 2 and 3. All 14 animal event venues were visited twice during 2016-2018, and most appeared to be relatively clean of animal wastes from their activities. There are a few one-time animal events which may be conducted at other locations, such as parks or school grounds. An example is Friends of Pets’ Annual “Dog Jog” which has been held at East High School and more recently at Service High. The Horse Drawn Carriage Company which operates in downtown Anchorage puts “catch bags” on their horses to collect manure. Most of the Agility Trial, AKC Dog Shows and Alaska Herding Groups do a good job of cleaning up before and after their activities because they don’t want the dogs to be distracted by animal waste (and this includes goose poop). Waste pickup is mandated in their use permits. MOA Parks and Recreation occasionally allows some animal events in parks, and while the permits state that “all debris and trash” must be cleaned up, animal wastes are not specifically listed on their online application. If not cleaned up, Solid Waste Services (SWS) will be called, but it’s highly unlikely that they clean up pet waste.

AWC’s annual Scoop-the-Poop Day does not require a permit from Parks and Rec, nor does its Annual Creek Cleanup. Parks and Rec staff do come around one or more times a day during these events and they haul away bagged pet waste and trash. We are grateful for that.

Sled dogs for the ceremonial start of the Iditarod and Ronly World Championship Sled Dog races are problematic, because the mushing trails cross parks, creeks, streets and greenbelts and no dog wastes are cleaned up along trails after the events. The same is true, although on a smaller scale, for Chugiak Dog Musher’s Association’s mushing trails and Tozier Track whose trails cross Campbell Creek numerous times. Mr. C.B. Stewart of Parks and Recreation assured Dr. Eley that “the dogs are trained athletes and do not poop while they run.” This is both incorrect and absurd as anyone who has mushed dogs or watched a mushing event close up knows. I have never seen a dog musher clean up dog feces other than in their dog yards (most compost the wastes or take them to the landfill), starting points (Downtown), or at rest stops during races.

In an attempt to monitor the impact of pet waste from mushing, AWC staff examined a 1,700’ section of the trail in the Chester Creek greenbelt at Eastchester Park a day after the 5 March, 2016, Ceremonial Start of the Iditarod in Anchorage. Twenty-three intact piles of dog feces were found or about one pile every 75 feet. Much of the area, which had been traversed by approximately 1,000 dogs in 4 hours, had been ground up so the snow was more of a brown and white mixture. A second sample of snow off the trail was collected for comparison. The *E. coli* sampling was by the Coliscan® Method¹⁴, and the findings of this sampling are shown in Table 5.

Table 4. Known Venues of Animal Activities in the Municipality of Anchorage

Activity	Venues
Agility Trials	Waldron Lake (occasionally) as well as other MOA parks
AKC Dog Shows	Chugiak Benefit Association Grounds, 18606 Old Glenn Hwy, Chugiak
Alaska Dog Sports	Their facility at 511 West 54th Avenue, Anchorage and ball fields
Alaska Herding Group Club	Chugiak Benefit Association Grounds, 18606 Old Glenn Hwy, Chugiak
Alaskan Sled Dog & Racing Association	Tozier Track, and Campbell and Chester Creeks and Greenbelt and Far North Bicentennial Park, Anchorage
Anchorage Horse Council Events	William Clark Chamberlin Equestrian Center, Anchorage
Chugiak Dog Musher’s	Beach Lake Park, Chugiak
Friends of Pets “Dog Jog”	Service High School, Anchorage
Horse Drawn Carriage Company	Downtown Anchorage and Chugiak
Hundesport Alaska & AK Schutzhund Clubs	Hundeplatz Field, Kincaid Park, Anchorage
Iditarod Ceremonial Start	Downtown, Chester Creek Trail, Campbell Greenbelt and Far North Bicentennial Park
Lions Club Rodeo	Lions Club Park, Eagle River
World Championship Sled Dog Races	Downtown, Chester Creek Trail, Campbell Greenbelt and Far North Bicentennial Park

¹⁴ At micrologylabs.com/page.php?page_id=93&page_name=Coliscan-Easygel.

Table 5. *E. coli* counts from samples collected from the Iditarod Ceremonial Start along Chester Creek Trail near 20th and the New Seward, Anchorage, AK, 6 March 2016.

Location	<i>E. coli</i> Colony Count Per 100 ml Sample
Iditarod Trail	1,120/100/ml
30 feet off the Iditarod Trail	40/100/ml)

High levels of *E. coli* are undoubtedly entering the ecosystem due to dog mushing events. It seems that mushers/dog handlers, mushing organizations, or volunteers should be required to clean up dog wastes on trails after events (besides Downtown where their vehicles are parked), although this may not be popular.

D. Stables and the Alaska Zoo:

Stables: Stables and the Alaska Zoo are shown on Maps 4 and 5, and they are in the Facilities List in Appendix 4. All of these stables were visited during the course of this project. The list is not comprehensive as some stables fall under the categories: No license required (3 or less animals), Home License (4-10) and Home License (11+) as long as they aren't a commercial operation. There are a considerable number (exact number unknown) of "backyard stables" in the Anchorage Bowl and Eagle River where 1 to 3, 4-10 and 11+ horses are kept for pleasure riding of the owners. They usually never attract attention unless an issue arises. Some of these "backyard stable" owners allow people to board their horses with some arrangement.

Eight of the eleven stables and the Alaska Zoo shown on Map 4 are in the Little Campbell Creek watershed, two are in Furrow Creek watershed and one is in Rabbit Creek watershed. The stable on Map 5 is in the Peters Creek watershed. The Alaska Zoo has the South Fork of Little Campbell going right through it. These findings suggest that attention needs to especially be directed towards the impact of these facilities on *E. coli* concentrations in the Little Campbell Creek watershed.

In *Some Facts About Horse Manure*¹⁵, a 2016 article published by Penn State University Extension, there is some interesting information on manure management that might be of useful. Here are a few important points:

1. Proper manure management is the legal and ethical responsibility of the horses' owners.
2. On average, a horse produces 0.5 ounces of feces and 0.3 fluid ounces of urine per pound of body weight every day.
3. Horse manure is about 60% solids and 40% urine.
4. A 1,000-pound horse produces about 31 lbs. of feces + 2 gallons of urine = 51 lbs. of manure/day (9.3 tons/year).
5. Stall Waste = 8-15 lbs. of bedding + 51 lbs. = 60-70 lbs. of stall waste/day (11.0-12.8 tons/year). About 12 tons of manure and soiled bedding will be removed annually from each horse stall (housing a full-time occupant).

¹⁵ At extension.psu.edu/horse-stable-manure-management.

6. A complete manure management system involves collection, storage (temporary or long-term), and disposal or utilization.
7. Manure management practices within horse facilities deserve careful attention.
8. Since most horses are kept in suburban or rural residential settings, it is essential for horse owners to be good neighbors.
9. Often, suburban horse facilities have limited or no acreage for disposal of manure and soiled bedding.
10. Several alternatives for handling manure include land disposal, stockpiling for future handling, removal from stable site, and composting.
11. Some stables have developed markets to distribute or sell the stall waste.
12. Proper manure management is based on simple principles that will virtually eliminate environmental pollution impacts and nuisances such as odor and flies.

Manure management raises concern about where it is “managed to” given that all the stables are relatively close to creeks (Maps 4 and 5), which means that runoff from the paddocks and adjacent areas carries *E. coli* that undoubtedly reaches the creeks. During licensing visits by AACC personnel to stables and mushing-dog yards, management of manure is discussed. When talking with stable owners, they always insist that they take proper care of their manure—it is either sold or given away, hauled to the landfill, or kept for other uses (particularly for compost).

Additionally, the impact of horse feces on the trail system and in creeks needs thorough investigation. Riders make intensive use of the trail systems near their stables and they also ride through many creek areas. Some of the horse trails cross creeks, and AWC staff have observed people riding horses in the creeks. Popular riding areas are the trail system near South Fork Little Campbell Creek and Far North Bicentennial Park.

Riders and mushers are supposed to clean up their horses’ waste whenever they are riding in the MOA—trails and creeks are no exception (Title 17; Officer Bradley AACC; and C.B. Stewart, MOA Parks and Recreation)—but they don’t. Mr. C.B. Stewart of Parks and Rec contends that riders do clean up after their horses, but Dr. Eley has never seen riders carrying a bucket and shovel.

The Alaska Zoo: The Alaska Zoo covers 25 acres at 4731 O'Malley Road in Anchorage. It is a popular attraction in Alaska with nearly 200,000 visitors per year. The zoo currently houses more than 100 birds and mammals, representing over 50 species. The zoo focuses on the native animals of Alaska as well as some exotics, such as Amur tigers (*Panthera tigris*), Bactrian camels (*Camelus bactrianus*), snow leopards (*Pathera uncia*) and yaks (*Bos grunniens*). Their “Mission is to promote the conservation of Arctic, Sub-Arctic and like-climate species through education, research and community enrichment.” They also are involved in animal rehabilitation as many of the zoo’s current animals were found orphaned or injured.

A restoration project focusing on the South Fork of Little Campbell Creek within the zoo’s boundary was completed in 2015. For a number of years there had been concern expressed about the impact of the zoo on water quality and flow in the creek. The following is a discussion by Patrick Lampi, the zoo’s

Executive Director, regarding the restoration of South Fork Little Campbell Creek as it flows through the Alaska Zoo (At alaskazoo.org/little-campbell-creek-restoration-[URL not found 4 January 2019]).

Little Campbell Creek Restoration at the Zoo

The Alaska Zoo is very pleased with the fish passage improvements to the creek. It was a great cooperative project and a pleasure to work with all the people involved. This endeavor has been "in the works" since around 2008. Visitors can look forward to the addition of interpretive graphics and signage about the project in the near future. Many people were involved over the years. Some have left positions they were in

while working on it. I hope they come out to see the fruits of their labor.~ *Patrick Lampi, Executive Zoo Director*

View a gallery of images by John Gomes showing the final stages of this project and the completed area. <http://www.akjohn.com/Zoos/COMPLETED-ZOO-CREEK-RESTORATIO/n-dDhVkr/i-2s5...>



South Fork of Little Campbell Creek

Many visitors are familiar with the creek that runs through the back of the zoo. This is the south fork of Little Campbell Creek which runs down the Anchorage hillside. Little Campbell Creek and its drainages make up an urban watershed in the Municipality. Ten federal, local and state agencies along with nonprofits joined Municipal Watershed Management Services to develop a plan with priority to increase fish passage.



The creek runs by the old elephant house. Several structures that stop fish passage are being removed, the two ponds will be replaced by three smaller ponds, the stream will take a curved path and an elevation drop will be in place. The natural stream bed will be restored by placing boulders, tree roots and stumps for fish habitat. All of this work is taking place downstream of the small bridge by the swan area. The creek quality in the zoo is good upstream from the bridge due to the protected nature of the area on grounds. At the end, a trail will extend to the

middle of the restoration area and signs will educate visitors about this important watershed in our ecosystem.

We will post updates to this page as we have them. If you have questions about this project, contact Executive Director Pat Lampi at plampi@alaskazoo.org.

Although fish passage is noted by Mr. Lampi as part of the restoration, unfortunately, just 100 yards east (61.12544° , -149.78901°) of where the South Fork Little Campbell Creek enters the zoo's boundary, a perched culvert prohibits any fish passage further upstream (Figure 9). Trout and young salmon can be found in the pool at the base of the culvert.



Figure 11. Perched culvert just east of the Alaska Zoo's boundary, South Fork Little Campbell Creek, Anchorage, 2017 (Photo by T. Eley).

This culvert, made of welded 55-gallon drums, was built in about 1953 so that the upstream landowner could create a pond. The Alaska Dept. of Fish and Game rates this as a “Red” culvert – “likely impacts fish passage” (At extra.sf.adfg.state.ak.us/FishResourceMonitor/?mode=culv).

Dr. Eley represented the Anchorage Waterways Council at Migratory Bird Day in the Alaska Zoo on a rainy Saturday, 21 July 2017. During that time, he was able to assess the restoration changes of South Fork Little Campbell Creek in the zoo. The creek water was clear despite the rain, and the riparian vegetation was lush. The creek was full of water and out of its banks in certain areas, so much so that it was flooding a section of the brown bears’ (*Ursus arctos*) enclosure with some fecal material near the water’s edge. Figure 10 shows a brown bear in its exhibit standing in flood waters from South Fork Little Campbell Creek in 2008 before restoration.



Figure 12. Brown bear (*Ursus arctos*) standing in flood water from South Fork Little Campbell Creek in the bear exhibit at the Alaska Zoo prior to channel improvements (2008). (Photo by T. Eley).

The brown bear (grizzly bear) exhibit has been a subject of controversy over several years, with the latest being a story by KTUU on 20 June 2016 about the alleged “negligent care” of the exhibit. One of the issues brought up in the complaint petition is that the bears have no water.

In the interview, zoo director Patrick Lampi stated, “the other thing that they said is the bears have no water, but as you folks have seen the South Fork Little Campbell Creek actually runs through a corner of the brown bear exhibit.”¹⁶ Figure 11 is a map from ArcGIS using the MOA streams shapefile which shows the bear exhibit in relation to creek.

¹⁶ www.ktuu.com/content/news/Zoo-responds-to-claims-of-grizzly-bear-.html The video on this story is no longer linked, but there is a .pdf of the content in Appendix 3.



Figure 13. The South Fork Little Campbell Creek adjacent to the southeast corner of the brown bear exhibit (ArcGIS map, MOA shapefile for streams, 2019)

A visit to the zoo on 4 October 2017 in a heavy rain, again found the creek flowing into the bear pen (Figure 12). The water runs along the inside and outside of the exhibit and then enters a culvert that takes the water back to South Fork Little Campbell Creek (Figure 13).



Figure 14. South Fork Little Campbell Creek water flowing into the brown bear exhibit at the Alaska Zoo 4 October 2017. (Photo by C. Northon)



Figure 15. Culvert returning zoo runoff to South Fork of Little Campbell Creek 4 October 2017.
(Photo by C. Northon)

The bear issue ties in with another concern about the zoo being the source of the high *E. coli* levels sometimes found in Little Campbell Creek. In response to these complaints, Dr. Eley interviewed Zoo Education Director Stephanie Hartman on 22 May 2016, about the zoo and its animals and South Fork Little Campbell Creek. The main points she emphasized are listed below. Dr. Eley's comments are in brackets.

1. Little Campbell Creek was realigned by the MOA in summer 2015 and the creek looks very natural and quite attractive. [Agreed]
2. The only animal wastes going into the creek are from waterfowl, water birds and mammals found in the creek—muskrat (*Ondatra zibethicus*), mink (*Neovison vison*) and river otter (*Lontra canadensis*). [Certainly, animal wastes from the brown bear (*Ursus arctos*), camel (*Camelus bactrianus*), yak (*Bos grunniens*), caribou (*Rangifer tarandus*), and muskox (*Ovibos moschatus*) exhibits drain down the walkways and paths into the creek during a heavy rain event such as on 21 July 2017 or 4 October 2017.] (Figures 16-19)
3. All cages drain into sewer system. [Perhaps, but stormwater from some cages does run down walkways to the stormwater drains or into the creek.]
4. Feces are picked up before washing cages.
5. Most wastes inside cages are food wastes, which are picked up and disposed of.
6. The creek water was tested by the MOA during the realignment of the creek and deemed okay. [She was not certain who tested the water but she thought it was the MOA].
7. The smell of feces is at a minimum except for the yaks. [Agreed]
8. Wastes are disposed of in the Municipal landfill, however residents can come and pick up wastes if they want it for their gardens. Yak wastes are the most popular.



Figure 16. Muskoxen pen, note the mud in the lower left. (Photo by C. Northon)



Figure 17. Muskoxen pen, note the mud and the slope toward South Fork Little Campbell Creek in the background (Photo by C. Northon)



Figure 18. Caribou pen whose corner slopes downhill (Photo by C. Northon).



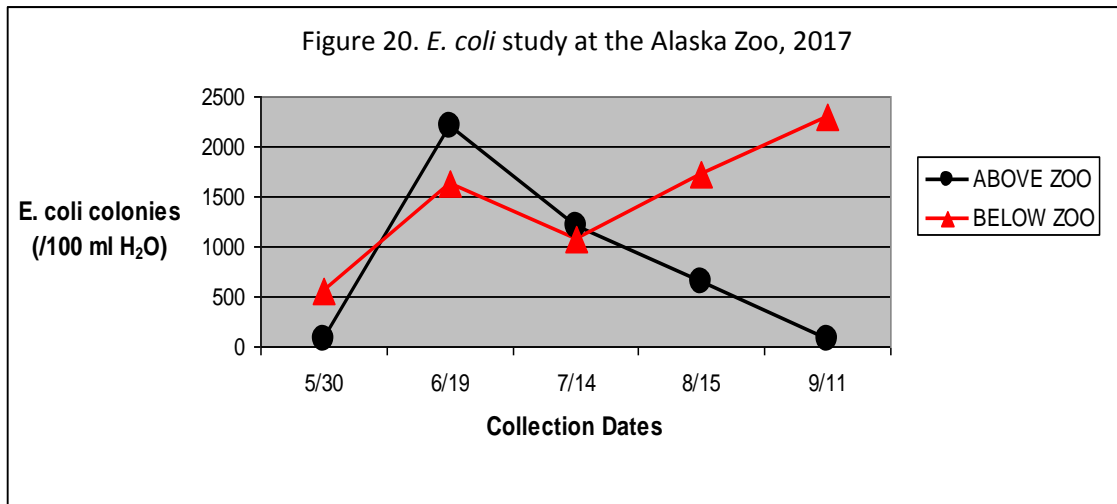
Figure 19. Yak pen, note the downhill terrain. (Photo by C. Northon)

Beginning in May 2017, through the generous support and assistance of SGS Environmental Services, AWC personnel have been able to conduct summer monitoring for *E. coli* of South Fork Little Campbell Creek where the creek enters and leaves the zoo. Anchorage experienced a very wet summer with 7.39

inches of precipitation during the May and September sampling occasions, which is about 1.09 inches above normal. The results of the 2017 samplings are shown in Table 6 and Figure 18. A total of 11,481 *E. coli* colonies were enumerated with 36.5% being from water above the zoo while 63.5% were collected from water exiting the zoo.

Table 6. <i>E. coli</i> colonies (/100 ml of creek H ₂ O) above and below the Alaska Zoo, 2017 ¹ .		
DATE	ABOVE ZOO	BELOW ZOO
30-May-17	78	553
19-Jun-17	2,200	1,630
14-Jul-17	1,200	1,080
15-Aug-17	640	1,730
11-Sep-17	70	2,300
TOTAL	4,188 (36.5 %)	7,293 (63.5 %)

¹ Laboratory analyses by SGS Environmental Laboratories.



While the zoo does provide the larger share of *E. coli* to upper Little Campbell Creek, the upstream homes also provide a significant number of bacteria as they are largely on septic systems. The Alaska Dept. of Environmental Conservation (ADEC) stated that, “well-built systems can last 20 years or more when properly maintained”¹⁷, which most people do not do in Alaska. Further, ADEC recommends that the septic system be pumped every two years and further recognized that few people follow this time table. Many of the homes upstream of the Alaska Zoo are older than 20 years and many still have the old wood-crib septic tanks.

¹⁷ dec.alaska.gov/water/wastewater/engineering/maintain-septic

ZOO RECOMMENDATION: AWC believes that continuous monitoring of *E. coli* levels in South Fork Little Campbell Creek above and below the Alaska Zoo and below the bear enclosure should continue. The *E. coli* concentrations below the zoo are significant with the zoo's contribution making up the larger component, but upstream stormwater run-off and septic leakage can't be ignored. We currently have one year's worth of sampling. Although the USGS and EPA consider one sampling season sufficient for baseline information, one season seems minimalist for Alaska in the summer where we may have extended wet or dry spells, and each sampling yielded significantly different information.

Water Diversion to the Anchorage Golf Course (2017)

One issue that was found during these investigations involves the diversion of water from the South Fork Little Campbell Creek to the Anchorage Golf Course. This is not a water quality concern in the sense of pollution from pet waste, but more in terms of having a healthy fish population. Water is diverted at the west end of the zoo in an underground piping system to irrigate the Anchorage Golf Course.

On 7 August 2017, an Anchorage resident, living on Pacer Street along South Fork Little Campbell Creek, just downstream of the zoo, called AWC to report that the creek was dry at his house. Dr. Eley visited the residence that day, and indeed there was little water running in the creek (Figure 19), and fish were trapped in the few pools that remained. The resident said that he had lived in the house for 7+ years and bought it because it was on the creek.



Figure 21. South Fork Little Campbell Creek at Pacer showing very little water and a cobbly substrate on 8 August 2017. (Photo by T. Eley)

He also checked the outflow from the zoo (Figure 20), and it was lower than normal based on observations when he was monitoring the creek.



Figure 22. South Fork Little Campbell Creek, after exiting the zoo compound on 7 August 2017. Water staining on the rocks shows recent water level being higher than it is now. (Photo T. Eley)

He then visited the culvert on Our Road (Figure 21) and the flow was considerably higher than the outflow from the zoo.



Figure 23. South Fork Little Campbell Creek as it exits the perched culvert east of Our Road and just before it enters the zoo. The flow is fairly normal for this time of the year. (Photo by T. Eley)

Lastly, he checked the South Fork Little Campbell Creek at the ASPCA office on Petersburg St., and the creek was entirely dry.



Figure 24. South Fork Little Campbell Creek adjacent to 8301 Petersburg Street showing the creek essentially dry.
(Photo by T. Eley)

Research on the Anchorage Golf Course’s surface water permit shows they are allowed to draw 122 gallons/min from the creek or as much as 18,247,786 gallons during the period of 1 June to 30 September. Between 1994 and 2008, the golf course has averaged 12,444,153 gallons per year with a start date as early as 20 April in 1998 and 1999 (HDR 2008¹⁸).

HDR contends that the permit for 122 gallons per minute was based on a flow of 0.27 ft³/sec. A flow of 0.27 ft³/sec would equal 16.2 ft³/min which would yield 2.16 gallons/min. Where are the other 120 gallons coming from? HDR also expressed concerns about over-drafting of the creek’s water for the golf course.

In 2007, the Municipality of Anchorage measured the Annual Peak of 4.5 ft³/sec. If we use the Annual Peak as the daily flow, 4.5 ft³/sec yields 36 gallons/min—certainly not 122 gallons/min. The USGS calculated the 2-year peak to be 23 ft³/sec, and if we use this figure—recognizing that it is a peak measurement—it would yield about 188 gallons/minute at the “peak,” but over the course of the year the flow would be lower than peak. These measurements are all based on “peak flows.”

AWC finds it difficult to see that the South Fork Little Campbell Creek would yield a sustainable 122 gallons/min, particularly at low flow. 122 gal/min would require a flow of 16.3 ft³/min especially if you would need to have some additional for the fish as it is an anadromous fish stream.

In light of this issue and the perched culvert above the zoo, it seems prudent to review fish passage in this area.

¹⁸ HDR Alaska, Inc. 2008.

The Alaska Dept. of Fish and Game and the Water Resources Section of Alaska Department of Natural Resources were contacted and photographs provided, but it is unknown if any action was taken.

E. Indoor Facilities: During 2016-2018, 66 of 81 (Appendix 4) indoor animal facilities were visited by Dr. Eley. All of the commercial animal facilities visited were open to the public and included groomers, pet stores that sell pets and pet supplies, boarding kennels, and doggy daycares. Licensees in private homes were not part of his visits as they had been reviewed by AACC personnel.

The indoor facilities—some with and without outside yards--were found to be very clean with all wastes being removed by commercial waste management. Outdoor areas associated with boarding kennels and doggy daycares were clean with waste cans and waste management tools and supplies on site. “Dog accidents” were cleaned up immediately both inside and out. A few kennels (AK Must Love Dogs, ASPCA, and others) are adjacent to creeks and have outdoor dog play yards, although their kennels are indoors. Best Management Practices (dog yard management, coir logs, soil, and grass) were being used to keep wastes from entering the creeks.

Indoor animal facilities come and go over time and many people provide commercial kenneling services, grooming and other facilities without the proper license. AACC is aware of these illicit facilities and attempts to deal with them as time allows. The “underground” nature of these unlicensed facilities makes enforcement difficult.

One concern that Dr. Eley noted was that several potentially invasive red-eared slider turtles (*Trachemys scripta elegans*) are being sold in some pet stores. The red-eared slider turtle has been sighted in significant numbers in University Lake, Chester and Campbell Creeks, and in a pond near Minnesota Ave. over the last couple of years. It is one example of an invasive species¹⁹ affecting waterways. In conclusion, indoor dog facilities—pet stores, doggy daycares, kennels and groomers—appear to have little to no impacts to creeks from pet waste. The places were clean and managed according to Title 17.

Facilities and Issues of Concern and Need for Additional Investigation:

There are three areas of concern that were found during this survey.

1. Stables: As discussed in the Stable section, horse manure is a concern for water quality of Anchorage’s creeks. Monitoring for *E. coli* above and below stables to ascertain if there are any manure related issues to water quality would seem prudent. Educational information for horse riders and owners concerning their legal requirement to clean up after their horses would also be useful.

2. The Alaska Zoo: Monitoring above and below the zoo to determine its contribution of *E. coli* to the South Fork Little Campbell Creek should be done. This topic was discussed above in the Alaska Zoo section and remains a concern.

¹⁹ The red-eared slider is included considered invasive outside its home range of the southeastern U.S. (At nas.er.usgs.gov/queries/factsheet.aspx?SpeciesID=1261) .

3. Dog Parks: The number of dogs using Anchorage’s eight dog parks is unknown, but it’s high. Accordingly, the pet waste that is left in dog parks has always been and remains a considerable problem. While educational campaigns are helpful, it is believed that stronger tactics are needed. A literature review shows that even high fines for leaving pet waste don’t necessarily deter people if there is no enforcement. Anchorage’s fines for leaving pet waste are \$250 for the first violation per premise, and \$500 for each subsequent violation per premise²⁰. One solution is to station an officer at parks for about an hour at random times to write citations. Once word gets out about citations being issued, it should increase the likelihood of dog owners cleaning up after their pets. Citing violators on Anchorage’s vast trail system would be much more difficult because users are less concentrated. However, if citations begin to be handed out, the pet community is likely to comply in areas other than dog parks. Undoubtedly, school yards—another whole problem—would not benefit. How to deal with them is a large problem.

²⁰ In AMC 17.70.020 for AMC 17.10.030 – Care and sanitation violations at [muni.org/Departments/health/Admin/animal_control/Documents/Codified%20Title%2017%20\(54%20page%20PDF\).pdf](http://muni.org/Departments/health/Admin/animal_control/Documents/Codified%20Title%2017%20(54%20page%20PDF).pdf)

Part IV. Recommendations for Additions or Changes to Licensing Program and Ordinance/Regulations that Could Have Positive Effects on Water Quality.

The following recommended changes to the Anchorage Municipal Code would have positive effects on water quality:

1. Though this was not discussed above, there has been a considerable amount of fecal pollution in Cuddy Pond (part of Fish Creek) because of humans feeding waterfowl. An ordinance is needed (in either AMC Title 17 or 21) that would make it illegal to feed aquatic birds in Anchorage lakes and creeks. Aquatic birds are a major source of *E. coli*. Large congregations of aquatic birds attracted by human feeding will significantly raise the *E. coli* level in waterbodies as we have seen in Cuddy Pond. In addition, the bird feces can collect in great amounts on the sidewalks and wash down into the water body. Human food is not good for aquatic birds. In areas where feeding occurs, there is also increased bank trampling and sloughing into the water. Large congregations of birds are more prone to disease epidemics, and they can also become a hazard to aviation. A number of mallard (*Anas platyrhynchos*) fitted with colored leg-bands at Cuddy Pond have been culled at the Anchorage International Airport and the Palmer Airport.
2. An ordinance is needed (in ether AMC Title 17 or 21) that would make it illegal to dump fish, other aquatic pets (e.g. turtles, frogs, etc.), and aquatic aquarium plants into Anchorage waterways or lakes. The ordinance should require pet stores to post signs concerning this prohibition. This is probably how elodea (*Elodea canadensis*) was introduced into many Anchorage Lakes. Several potentially invasive and problematic aquatic plants or their seeds can also be ordered over the internet, including elodea.
3. AMC 17.10.090²¹ should be reviewed and updated to reflect the current off-leash Dog Parks. From the latest version available online, there are only 5 off-leash dog areas listed. The newer ones, e.g. Arctic-Benson, Whisper Faith Kovach, and Valley of the Moon, need to be added.
4. AMC Sec.21.05.050 discusses large domestic animal facilities, which harbor four or more “large domestic animals.” Large domestic animals are not defined, although horses and equestrian activities are mentioned later in this section. It would be useful to clearly define “large domestic animals”.
5. AMC Sec.21.05.070 (Accessory Uses and Structures) Clarification should be made regarding the lot sizes for animals. It now states that “up to five animals may be kept on lots of 6,000 ft² (0.14 acres) or less with an additional one animal per additional 1,000 ft². It is unclear whether the five animals on lots of 6,000 ft² or less applies just to outside animals or animals kept primarily in a residence. Further, it states, “One to three large domestic animals may be kept outdoors on lots of 20,000 ft²

²¹ anchorage-ak.elaws.us/code/coor_title17_ch17.10_sec17.10.090

[0.46 acres] or greater...” Clarification as to what is the minimum size lot that a horse can be kept on and whether a large domestic animal includes miniature horses, pigmy goats, goats, alpacas, llamas, sheep, and pigs, would be helpful.

Part V. Other Recommendations.

1. In light of the geographical extent of the Municipality and the number of pets residing in the Municipality, hiring additional animal control officers who could enforce existing ordinances might help motivate more pet owners to clean up pet waste. Due to other demands of the officers’ time, there is little to no enforcement of ordinances that are already on the books. While many folks do clean up their pet waste for positive reasons (not because they will get a ticket), for others there needs to be some incentive, e.g. a \$250 citation.
2. Of the current licensed facilities in Anchorage, fecal coliform testing of the creeks adjacent to the ~10 that are located adjacent or close to waterways should be done to make sure they are not the sources of high fecal loads in the creeks. Additionally, it is suggested that stables close to creeks and the areas above and below the Alaska Zoo and the Valley of the Moon and University Lake dog parks should also be tested on a regular basis²². Finally, a good accounting of stables should be undertaken.
3. Much of this review involved online research for information as well as to see what is available for the public. The AACC page is up to date on off-leash dog areas and basic guidelines (muni.org/Departments/health/Admin/animal_control/Pages/dogparks.aspx). The MOA Parks and Rec webpage for off-leash dog areas (muni.org/Departments/parks/Pages/DogParks.aspx), however, is not. Valley of the Moon and Whisper Faith Kovach are not listed, and the linked maps for some of those listed are in need of updates.
4. MOA Parks and Rec should review the signage in off-leash parks and areas to assure that the locations of these areas are clearly defined.
5. Attention should be focused on all dog park signage for clarity in usage with special attention to Gasline Trail in Far North Bicentennial Park. By its very nature being a trail, it may be less obvious to users where the off-leash area is (or isn’t).
6. Adoption of an ordinance for the CCENA prohibiting dogs or other pets.
7. Although pet waste stations were not specifically addressed in this paper, they are an important part of the discussion. Increasing pet waste stations²³ and trash cans in dog parks and along trails is always a good idea. The stations and bags are not, however, inexpensive nor is the cost for staff to

²² Fecal coliform testing by AWC between 2010 and 2017 at the outfalls of University Lake and Westchester Lagoon has typically not shown high amounts of *E. coli* exiting the lake or lagoon due to the nature of the bacteria binding itself to sediment and sinking. Low readings of *E. coli* do not necessarily mean that there is little to no bacteria pollution, so testing at the outfalls is still recommended.

²³ There are approximately 150 pet waste stations in the Anchorage “bowl”. See Map 1.

maintain them and empty trash. A good indicator of their need is confirmed by the collection of grocery bags that are found hanging in dog parks (Fig. 26) and other locations. Bags are often left by pet owners who visit areas and find the pet waste stations empty²⁴, and this is used to encourage cleanup of pet waste by others.



Figure 25. University Lake Dog Park formal and informal pet waste station (Photo by C. Northon, 2018)

Sadly, even with providing the supplies for pet owners to pick up waste with, there will still be pet waste that is not picked up at all, and there will be bagged pet waste left on the ground (Fig. 27). The reasons for the latter are many. Some people are headed out on a walk and plan to (and do) return to where they left bags. Others may take a different return route and “forget” to go back and retrieve their bag. Many people don’t like to carry a bag of pet waste with them, especially if they are jogging or pushing a child in a stroller. Some believe that biodegradable bags mean that something “special” happens to the pet waste. It doesn’t. Others must assume there is a “poop fairy”. There isn’t, but there are many concerned pet owners who do retrieve bags left by others. One of the most frustrating situations is a bag that is left within 50’ of a trash can. No excuse.



Figure 26. Bag of pet waste left along a path (Photo by C. Northon, 2018)

²⁴ Sometimes pet waste stations are empty although Parks and Rec does a great job of filling them. This can be due to high use or vandalism—often the stations have had their bags removed and tossed all over the ground.

Conclusion

Issues with pet waste are universal and long standing²⁵, and for good reason. This discussion is about improving water quality by reducing pollution from domestic pet waste. There are many situations where pet waste contributes to degraded water quality, and not all can be suitably addressed for a variety of reasons. It is our belief that some carefully targeted areas as suggested above would be useful in reducing problems from pet waste.

²⁵ citylab.com/life/2016/05/a-brief-history-of-dog-poop-etiquette-campaigns/480870/

APPENDICES

APPENDIX 1

Municipality of Anchorage Animal Waste Management Guidelines

MUNICIPALITY OF ANCHORAGE

Department of Health and Human Services



907-343-6718

Mayor Ethan Berkowitz

Land Use Enforcement
Main Office: 343-8301
Complaint Hotline: 343-4141

Animal Waste Management Guidelines

These guidelines have been developed to address and prevent public health problems associated with storage and disposal of animal waste. Public health concerns include attraction and harborage of pests, odor, runoff, pollution of surface water, contamination of groundwater, unsightly premises and general public nuisance.

Manner of storage

Waste must be contained with container either closed or covered. Examples of waste containers are Dumpsters, watertight trailers, lined watertight pits or bins; and for smaller operations, plastic or metal garbage cans, garbage bags. These examples are considered closed containers. Dumpsters and garbage cans with lids, tarp covered waste storage areas and other means to keep rain and snow off stored waste are considered covered.

Frequency of Waste Removal

Waste must be removed from the property at least once every seven days. See other side of this sheet for locations of facilities accepting waste for disposal. Proper disposal does not include burying waste on your property. MOA Land Use codes do not allow use of waste as fill.

A single horse can produce about 50 pounds of manure and urine per day which needs nearly 2 ½ cubic feet of storage space. That's over eight tons of waste in a year. If bedding materials are included it adds up even quicker. In the absence of frequent removal, this amount of waste can quickly pose disposal challenges. The amount of waste stored on a property at any one time should not exceed the amount expected to be and possible to be removed within a week.

Waste storage location/ setback distances

Drinking water wells	100 feet
Streams and other surface water	25 feet
Property lines	Structures over 30" high other than fences must meet setback requirements for the zoning district in which they are located. For more information on fences, call Zoning/Land Use at 343-8380.

Composting on site, a difficult alternative to removal every seven days

Logistics can make this a difficult alternative even with only a couple of animals. Composting is the breakdown of organic material containing nitrogen and carbon in the proper ratios and in the presence of oxygen. When managed properly, it has very little or no odor. Managing material ratios and frequent turning can be labor-intensive. Compost must be contained and maintained free of odors. If you compost animal waste on your property, you will need to identify a timeframe for composting to be complete and identify an adequate destination for all compost.

Guidelines based on AMC 15.20 Public Nuisance revised 1/31/05

P.O. Box 196650 • Anchorage, Alaska 99519-6650 • <http://www.muni.org>

(muni.org/Departments/health/Admin/animal_control/Documents/Animal%20Waste%20Guidelines.pdf)

This information is not easily found.

APPENDIX 2

MOA AMC 26.50.060 Prohibited Acts

ADEC Fish Waste Disposal Guidelines

Anchorage Municipal Sewer Use Code pollutant limits

(AMC 26.50.050 and AMC 26.50.060)

26.50.050 - Prohibited acts.

A. It shall be unlawful for any user to:

1. Introduce or cause to be introduced into the municipal sewerage system any pollutant or wastewater which causes pass through or interference. This general prohibition and the specific prohibitions below apply to all users whether or not they are subject to categorical pretreatment standards or any other national, state, or local pretreatment standards or requirements.
2. Discharge or cause to be discharged any of the following described pollutants, substances, or wastewater into the municipal sewerage system:
 - a. Any stormwater, surface water, surface runoff, groundwater, roof runoff, subsurface drainage, cooling water or other unpolluted water.
 - b. Any water or wastewater which contains petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin in amounts that will cause interference or pass through or which in the opinion of the utility are in amounts greater than that which would be normally construed as incidental in normal discharges.
 - c. Any solid or viscous substance, or liquid that can become viscous when cooled, in amounts capable of causing obstruction to the flow in sewers or other interference with the proper operation of the sewerage system such as, but not limited to, fat, grease, uncomminuted garbage, animal guts or tissues, hair, hide, fleshings or entrails.
 - d. Any wastewater which creates a fire or explosive hazard, including, but not limited to, wastewaters with a closed-cup flashpoint of less than 140°F (60°C) using the test methods specified in 40 CFR 261.21. At no time shall two (2) successive readings on an explosion meter, at the point of discharge into the system (or at any point in the system), be more than five (5) per cent nor any single reading over ten (10) per cent of the lower explosive limit (LEL) of the meter.
 - e. Any wastewater having a pH lower than 5.0 or higher than 12.5 at any time, or having any corrosive property capable of causing damage or hazard to structures, equipment and personnel of the sewerage works.
 - f. Any wastewater which results in the presence of toxic gases, vapors, or fumes in a quantity that, in the opinion of the utility, may cause worker health and safety problems.

- g. Any wastewater containing radioactive substances except in compliance with applicable state or federal regulations.
 - h. Any noxious or malodorous liquids, gases or solids which either singly or by interaction with other wastes are sufficient to create a public nuisance, or hazard to life or health, or that are sufficient to prevent entry into the municipal sewerage system for its maintenance and repair.
 - i. Any substance that will cause the utility to violate its NPDES permit.
 - j. Any substance that may cause the municipal sewerage system's treatment residues, sludges, incinerator ash or scums to be unsuitable for reclamation and reuse or to interfere with the reclamation process.
 - k. Any wastewater that causes the temperature at the treatment works influent to exceed 40 degrees Celsius (104 degrees Fahrenheit).
 - l. Any pollutants, including oxygen demanding pollutants, released at a flow rate or concentration that, either singly or by interaction with other pollutants, will interfere with operation of the municipal sewerage system.
 - m. Any wastewater containing medical wastes from industrial users including but not limited to hospitals, clinics, offices of medical doctors, convalescent homes, medical laboratories or other medical facilities.
3. Prohibited connection of sanitary sewer with storm sewer system. Interconnect or cause to be interconnected directly or indirectly any part of a sanitary sewer system with any part of a storm sewer system.
 4. Prohibited discharge at unapproved location. Discharge or cause to be discharged into a sanitary sewer any waters or wastes whatsoever other than through an approved, permanent sewer extension, or at a sewage dump station or other location that has been specifically so designated by the utility.
- B. Vandalism. No person or entity shall willfully or negligently break, damage, destroy, uncover, deface, tamper with, or prevent access to any structure, appurtenance or equipment, or other part of the municipal sewerage system.
- C. Any person or entity found in violation of this section shall be subject to the sanctions set out in this chapter.

(AO No. 81-207; AO No. 86-118, 9-4-86; AO No. 2000-129(S), § 6, 11-21-00; AO No. 2012- 77, § 5, 8-7-12)

Note—Formerly § 26.50.022.

Fish Waste Handling & Disposal

August 2016



Division of
Environmental Health

Solid Waste Program

Anchorage Office:
555 Cordova St
Anchorage, AK 99501
(907) 269-7802
Fax (907) 269-7510

Fairbanks Office:
610 University Ave
Fairbanks, AK 99709
(907) 451-2108
Fax (907) 451-2188

Juneau Office:
410 Willoughby Ave.
Suite 303
Juneau, AK 99801
(907) 465-5318
Fax (907) 465-5362

Improper disposal of fish waste from sport fishing, personal use fishing, and commercial fisheries poses a potential risk to the environment and public health and safety. The Alaska Department of Environmental Conservation (ADEC) Solid Waste Program only regulates the land disposal of fish waste from commercial operations. However, it is important to understand the best management practices for disposing fish waste to reduce nuisances and animal attraction.

Personal Use & Sport Fish Waste

Even for sport and personal use fishing, disposing of fish waste on public or private land is illegal and can result in fines. The [Alaska Department of Fish & Game](#) recommends that you clean fish riverside or in port, chop fish carcasses into numerous pieces, and throw them into deep or fast-moving water or use a provided fish grinder. Anglers who remove fish from the fishing site and fillet or process them must also dispose of fish waste in a safe manner:

- α Fish waste should be taken directly to a permitted landfill that will accept it.
 - The Central Peninsula Landfill in Soldotna accepts fish waste free of charge during the fishing season.
 - Anchorage Regional Landfill, the Central Transfer Station, and the Girdwood Transfer Station accept residential fish waste.
 - Matanuska-Susitna Borough takes bagged residential fish waste at the Palmer Central Landfill and the Big Lake, Butte, and Sutton transfer stations.
- α If you have local trash pickup, freeze the fish waste to eliminate odors and then put it out of the morning of your trash pickup day. Do not place waste out the night before or put it in commercial dumpsters.

Commercial Fish Waste

ADEC Solid Waste Program allows three methods for managing commercial fish waste on land:

- α Landfill Disposal: Commercial fish waste may be disposed in a permitted landfill willing to accept it.

Improper disposal of fish waste creates a dangerous bear attractant.

- **Chop the fish carcass up and throw it into fast-moving water;**
- **Take it directly to the landfill; or**
- **Put it in YOUR trash the morning of pickup.**





Solid Waste Program

- α **Land Application:** Fish waste may be ground and tilled into agricultural or silvicultural land as fertilizer, provided the waste is processed and treated as prescribed in the solid waste regulations [18 AAC 60.010(e)].
- α **Composting:** Fish waste can be composted to create a usable product. Several successful composting projects have been operated in Alaska. [Alaska Sea Grant](#) offers [guidance](#) on proper composting operations in Alaska. Depending on the volume of waste involved, a composting operation may require a solid waste treatment permit or plan approval.

Commercial fish waste placed on land must be carefully managed to minimize pathogens, odors, animal attraction, and contamination of water resources. Improper management of fish waste can attract wildlife and pose a serious risk to health, safety, and the environment. Contact the ADEC Solid Waste Program to determine if your project requires an authorization.

Disposal of commercial fish waste in water requires a permit from the ADEC [Wastewater Discharge Program](#).

18 AAC 60.010

Land Application of Fish Processing Waste

(e) Subject to 18 AAC 60.040(b), a person who wishes to dispose of organic waste from a commercial slaughterhouse or fish processing waste may apply that waste to agricultural or silvicultural land for soil enhancement purposes if the waste is

- (1) ground up to less than two inches in diameter;
- (2) treated by a method described in 40 C.F.R. 503.15, revised as of July 1, 1997, adopted by reference, to reduce the number of *salmonella* spp. or fecal coliform bacteria present to meet the Class A requirements for pathogen reduction at the time of land application;
- (3) incorporated into the soil surface when the waste is applied;
- (4) applied at or below the agronomic rate for nitrogen for any crop or vegetation that will be grown on that land;
- (5) applied in a manner that does not create an odor nuisance or attract animals or other vectors; and
- (6) applied in a manner that ensures that run-off of surface water from the disposal site does not violate the water quality standards in 18 AAC 70.

18 AAC 60.040 (b) A person may not dispose of septage, sewage solids, fish waste, animal manure, or animal byproducts or waste on the ground within 100 feet of a well that produces water suitable for drinking.



APPENDIX 3

“Alaska Zoo responds to claims of grizzly bear negligence”
KTUU story 19 June 2016

Alaska Zoo responds to claims of grizzly bear negligence

By Patrick Enslow / KTUU | Posted: Sun 9:38 PM, Jun 19, 2016 | Updated: Mon 7:24 AM, Jun 20, 2016

ANCHORAGE (KTUU) A recent online petition is claiming the Alaska Zoo has been negligent in the care of its grizzly bear exhibit.



Phil Walczack / KTUU



The petition accuses the zoo of failing to provide a sufficient habitat, specifically, "No forest for any comfort except for a couple of dead pine trees in their empty cage."

Author of the petition, Amy Smith, says she launched the effort after seeing the bears on a trip to the Alaska Zoo with her husband.

Zoo director Patrick Lampi said the bears are well cared for.

"My reaction is, unfortunately, the people just didn't know what they were talking about," Lampi said.

The director went on to defend the exhibit explaining there are natural water sources inside the exhibit in response to criticism in the petition.

"The other thing that they said is the bears have no water. As you folks have seen the south fork of the Little Campbell Creek actually runs through a corner of the brown bear exhibit," said Lampi.

While the zoo acknowledges the exhibit is not perfect but says it provides everything the bears need.

"Bears like to dig around in the natural sub straight," said Lampi. "They are not active all the time, but they don't have to be since they aren't out hunting for food."

The **website** shows the petition is nearing 700 signatures with 1,000 being the goal.

"We request that the board immediately reallocate funds to reconstruct the grizzly bears exhibit into a natural habitat," writes Smith in the petition.

Currently, three grizzly bears live in the exhibit Izzy, Oreo, and Jake. KTUU reached out to the author of the petition but did not hear back.

APPENDIX 4

Animal Facilities Visited, 2016-2018²⁶

²⁶ Some of these facilities have closed and a few new ones have opened as of December 31, 2018.

APPENDIX 4. Animal Facilities Visited, 2016-2018.

Dog Parks	
Percent of Dog Parks Visited	100% (n=8)
Arctic Benson Park (Fenced Area)	
Connors Bog	
Far North Bicentennial Park (North Gasline Trail)	
Russian Jack Springs Park (north side)	
South Anchorage Sports Park (Future American Legion Fields)	
University Lake Park	
Valley of the Moon (Fenced Area)	
Whisper Faith Kovach Park (Fenced Areas)	
Animal Services	
Percent of Facilities Visited	100% (n=6)
Municipality of Anchorage Animal Care and Control	4711 Elmore Rd, Anchorage, AK. 99507
The Alaska Zoo	4731 O'Malley Rd, Anchorage, AK. 99507
Bird Treatment & Learning Center	15510 Old Seward Hwy, Anchorage, AK. 99516
Humane Society Rescue	1200 E. 76th Ave #122, Anchorage, AK. 99518
Alaska SPCA	8301 Petersburg St., Anchorage, AK. 99507
Anchorage International Airport	5000 W International Airport Rd, Anchorage, AK 99502
Stables	
Percent of Stables Visited	100% (n=13)
Amazing Grace's Miniature Horses	7340 Holman Ave., Anchorage, AK. 99516
Chamberlain Equestrian Center	3900 Abbott Rd, Anchorage, AK. 99511
Diamond H Ranch	4631 O'Malley Rd, Anchorage, AK. 99507
Equine Assisted Therapy	3900 Abbott Rd, Anchorage, AK. 99507
F-Bar-J Ranch	4140 Lore Rd, Anchorage, AK. 99507
Horse Drawn Carriage Company	22012 Blair Ave., Chugiak, AK. 99567
Moose Meadow Equestrian Center	58101 Moose Meadow Ln, Anchorage, AK. 99516
Outten's Riding Ranch	5700 Huffman Rd, Anchorage, AK. 99516
Robin Lindahl	11120 Birch Road, Anchorage, AK. 99516
Rose Brigmon	3741 Ptarmigan Terrace, Anchorage, AK. 99516
Six Bar E Stables	11401 Totem Rd, Anchorage, AK. 99516
The Learning Farm	11601 Gander St., Anchorage, AK. 99516
Wildwood Stable	5602 E.104th Avenue. Anchorage, AK. 99507

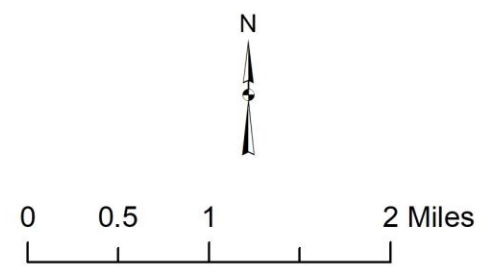
Doing Business As	Address
Indoor Facilities Visited	81% (n=66 of 81) Some of these facilities were not in business or not possessing licenses on 1 Dec. 2018.
3H Services	PO Box 221892, Anchorage, AK. 95222
A Happy Dog Day Camp	1525 E Tudor Rd, Anchorage, AK. 99507
AK Bark	1901 W. Dimond Ave, Anchorage, AK. 99518
AK Must Love Dogs	6614 Lake Otis Pkwy, Anchorage AK. 99507
Alaska Mill and Feed	1501 E. 1st Ave., Anchorage, AK. 99501
Alaska Dog Sports	Tan Bldg behind 511 W. 54th, Anchorage, AK. 99518
Alaska House Watch	3820 Lake Otis Pkwy, Anchorage, AK. 99508
Alaska K9 Aquatics	549 W Intl Airport Rd Ste B9, Anchorage, AK. 99518
Alaska Pet Boarding & Daycare	1614 N Post Rd, Anchorage, AK. 99501
Alaska Dog Sitting and Walking	20214 Steffes St, Chugiak AK. 99567
Alaskan Golden Pet Sitters	420 Fischer Ave, Anchorage, AK. 99518
Alyeska Canine Trainers	549 W Intl Airport Rd, Anchorage, AK. 99518
Anchorage Dog Walkers	2011 Pembroke St, Anchorage, AK. 99504
Animal Daycare & Boarding	5716 Kennyhill Dr. Anchorage AK. 99504
Arctic Tails	1601 E. 84th Ave. 107 Anchorage AK. 99507
Arfie's Doggie Day Care 1	535 E. 6th Ave. Anchorage AK. 99501
Arfie's Doggie Day Care 2	1087 W. 27th Ave, Anchorage, AK. 99501
Aurora K9 Daycare	3601 Henderson Loop, Anchorage, AK. 99507
Autumn Paris Pet Services	8225 Old Seward Hwy, Anchorage, AK 99518
B & C Kennels	1000 W 66th Ct, Anchorage, AK. 99518
Barking Lot, LLC	7950 Casey Cir. Anchorage AK. 99507
Best Friend Pet Care	10265 Jamestown Dr, Anchorage, AK. 99507
Best Friend Pet Care & Dog Walking	7100 W Henderson Loop Ste 5, Anchorage, AK. 99507
Best In Show Boarding	4451 De Armoun Rd, Anchorage, AK 99516
Best of Breed Pet Grooming	5915 Lake Otis Pkwy # 5, Anchorage, AK. 99507
Bev's Dog Grooming	409 W Northern Lights Blvd, Anchorage, AK. 99503
Brigitte's Dog Grooming	6580 Askeland Dr. Anchorage AK. 99507
Canine Connection	3290 Montpelier Ct, Anchorage, AK. 99503
Canine Design Pet Spa	3409 Murphy Cir, Anchorage, AK. 99502
Chewy's Dog Wash	13135 Old Glenn Hwy Ste 105, Eagle River, AK. 99577
Chugach Kennel	Eagle River, AK 99577
Chugach Pet Sitting	Eagle River, AK 99577
Cloud's Critter Camp	21631 Morning Dr. Chugiak AK. 99567
Country Canine	12400 Old Glenn Hwy Ste 37, Eagle River, AK 99577
D Bar E Pet Grooming	7100 Old Seward Hwy, Anchorage, AK. 99518
Dog Tired Doggie Daycare	310 E. Fireweed Ln. Anchorage AK. 99503
Dog Wash Resort	1000 W. 66th Ct, Anchorage, AK. 99518
Doggie Dog World	7121 Oakwood Dr. Anchorage AK. 99507
Doggie Motel	2728 E 68th Ave, Anchorage, AK. 99507
Dogs Day 'Bow'tique	7801 Schoon St Unit E, Anchorage, AK. 99518

Dogs Delight	2706 Fairbanks St, , Anchorage, AK. 99507
Forget-Me-Not Ferret Rescue	8530 E 17th Ave., Anchorage, AK. 99504
Glamour Looks	600 E Northern Lights Blvd, Anchorage, AK. 99503
Golden Days Pet Grooming & Dog Daycare	6209 Mike St, Anchorage, AK. 99518
Happy Hearts Daycare	3101 Rose St. Anchorage AK. 99508
Happy Paws	1425 Muldoon Rd, Anchorage, AK. 99504
Hillside Happy Tails	No address listed, Anchorage, AK 99511
Home Away From Home Inc (Daycare & Boarding)	16444 Brooks Loop, , Anchorage, AK. 99577
It's A Dog's Life LLC	12400 Old Glenn Hwy Ste 4, Anchorage, AK. 99577
Jewel Lake Boarding Kennels & Grooming	3630 Jewel Lake Rd, Anchorage, AK. 99502
Jordan's Pet Grooming	7801 Spruce St. Anchorage AK. 99507
Jo's Boarding Place	2510 W 77th Ct, Anchorage, AK. 99502
K9 Training Services	15300 Old Seward Hwy, Anchorage, AK. 99516
Lacey's Dandy Doggie Day-Care	1210 E 70th Ave, Anchorage, AK. 99518
M Bar D Feed and Tack	8791 Cameron, Anchorage, AK. 99507
Mobile Dog Trainer	18232 S Birchwood Loop Rd, Chugiak, AK. 99567
The Dog Park (Boarding)	19926 Tenada Ave. Chugiak AK. 99567
The Natural Pet Grooming	18948 Beverly Ave. Chugiak AK. 99567
Patrice Weinmeister	231 W. Riverdance Cir. Wasilla AK. 99654
Pat's TLC Home Boarding for Small Breed Dogs	4785 Cambridge Way, Anchorage, AK. 99503
Paws In Motion	12000 Industry Way # N-5/6, Anchorage, AK. 99515
Pet Smart	1200 N. Muldoon Rd. Anchorage AK. 99504
Pet Smart & Pet Hotel	601 E. Dimond Blvd. Anchorage AK. 99515
Pet Zoo	12046 Business Blvd. Eagle river AK. 99577
Pet Zoo	901 E. Dimond Blvd. Anchorage AK. 99515
Petco	8621 Old Seward Hwy. Anchorage AK. 99515
Petco	3090 Mountain View Dr. 180, Anchorage AK. 99501
Peters Creek Pet Boarding	20843 Old Glenn Hwy, Chugiak, AK. 99567
Pethotel	601 E Dimond Blvd, Anchorage AK. 99515
PetLover Petsitting	10124 Goose Berry Pl, Anchorage AK. 99515
Poop Patrol	1201 Crow Berry Cir, Anchorage AK. 99515
Primming Pooches and Cats	801 Valley St. Anchorage AK. 99504
Pup Culture Doggy Daycare	11901 Industry Way # A5, Anchorage AK. 99515
Rabbit Creek Kennels	3255 E. 150th Ave. Anchorage AK. 99516
Southpaw Kennels	11801 Old Seward Hwy. Anchorage AK. 99515
That Dog Lady	5955 Old Seward Hwy. 5 Anchorage AK. 99518
The Hound Lounge	2513 Fairbanks Street, Anchorage AK. 99503
The Pet Stop	1921 W Dimond Blvd, Anchorage AK. 99515
Warm Memories	11120 Birch Rd., Anchorage AK. 99516
Welcome To My Yard	2602 Eide St., Anchorage AK. 99503
ZoFamily	3911 Astro Cir, Anchorage AK. 99517

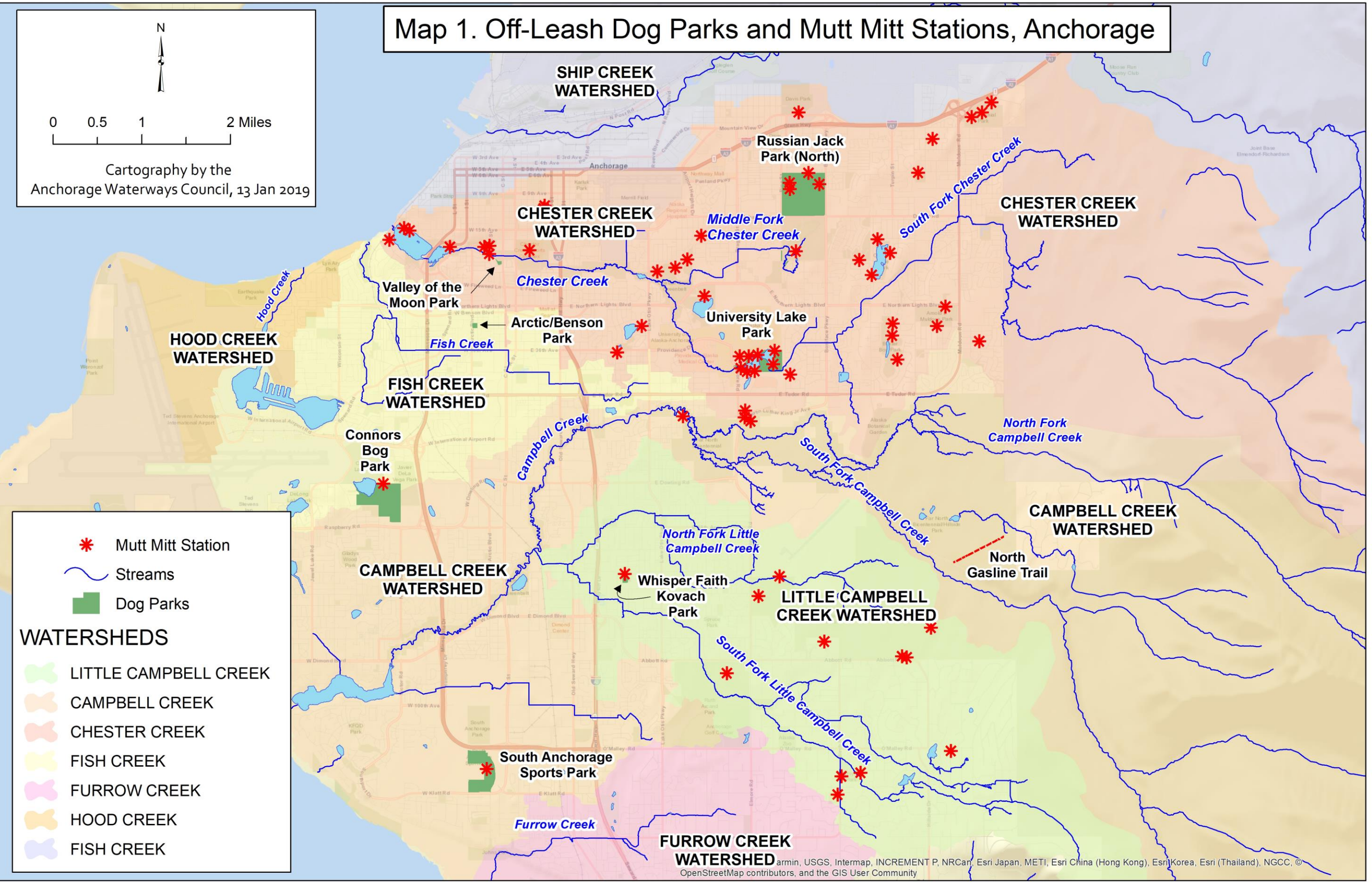
APPENDIX 5

Maps

Map 1. Off-Leash Dog Parks and Mutt Mitt Stations, Anchorage



Cartography by the Anchorage Waterways Council, 13 Jan 2019



- Mutt Mitt Station
- Streams
- Dog Parks

WATERSHEDS

- LITTLE CAMPBELL CREEK
- CAMPBELL CREEK
- CHESTER CREEK
- FISH CREEK
- FURROW CREEK
- HOOD CREEK
- FISH CREEK

Map 2. Anchorage Animal Venues

Legend:

- MOA Parks and Greenbelts
- Service High
- Fur Rondy & Iditarod Trails
- Animal Event Venues

Note: Other venue locations are used on an irregular basis.

0 0.5 1 2 Miles

Cartography by the Anchorage Waterways Council, 13 Jan 2019

Start of the Iditarod and Rondy World Championship Races

Horse-Drawn Carriages

Waldron Lake Park

Tozier Track

Shultzhund Training Area, Kincaid Pk

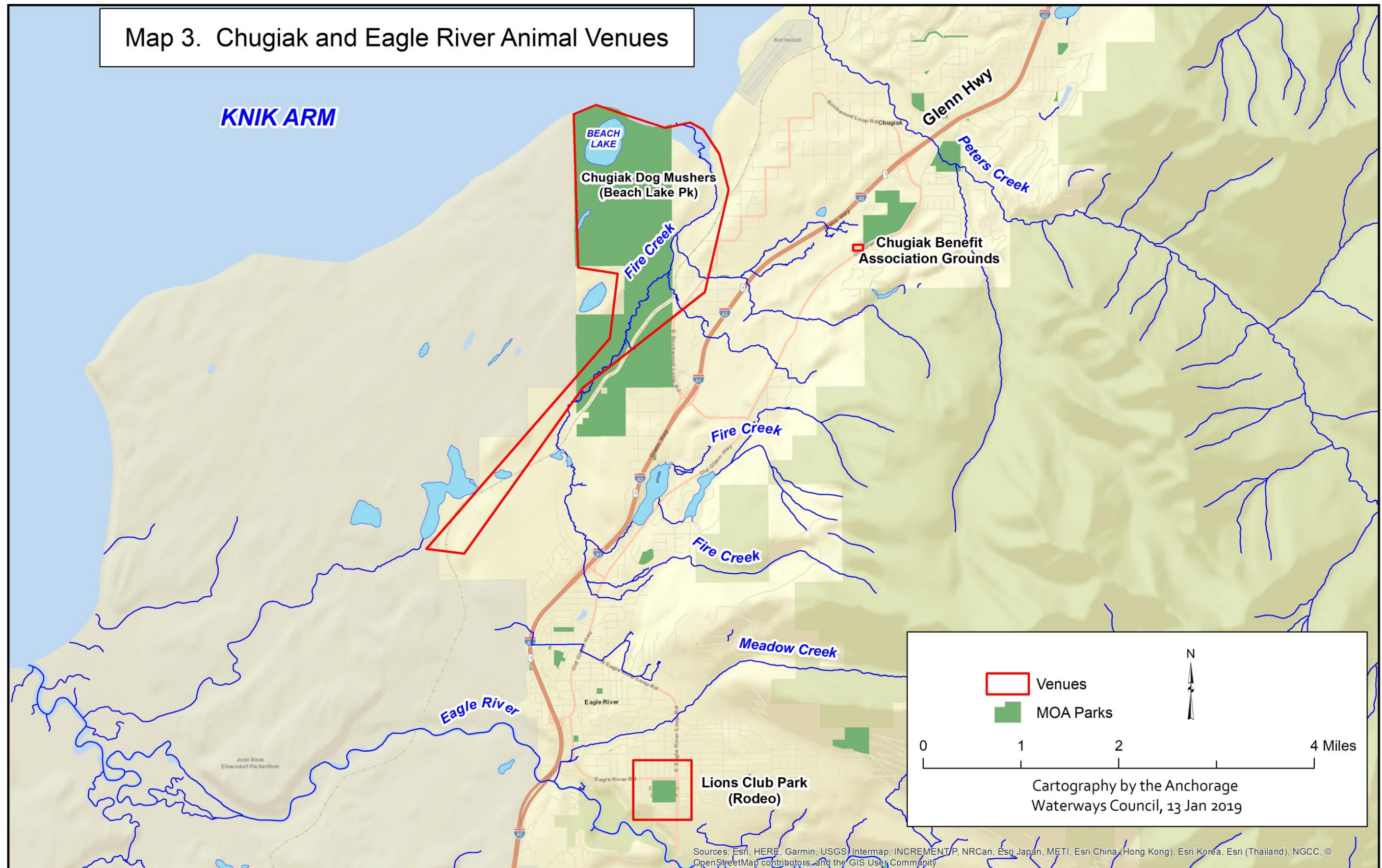
W.C. Chamberlain Equestrian Center

TURNAGAIN ARM

KNIK ARM

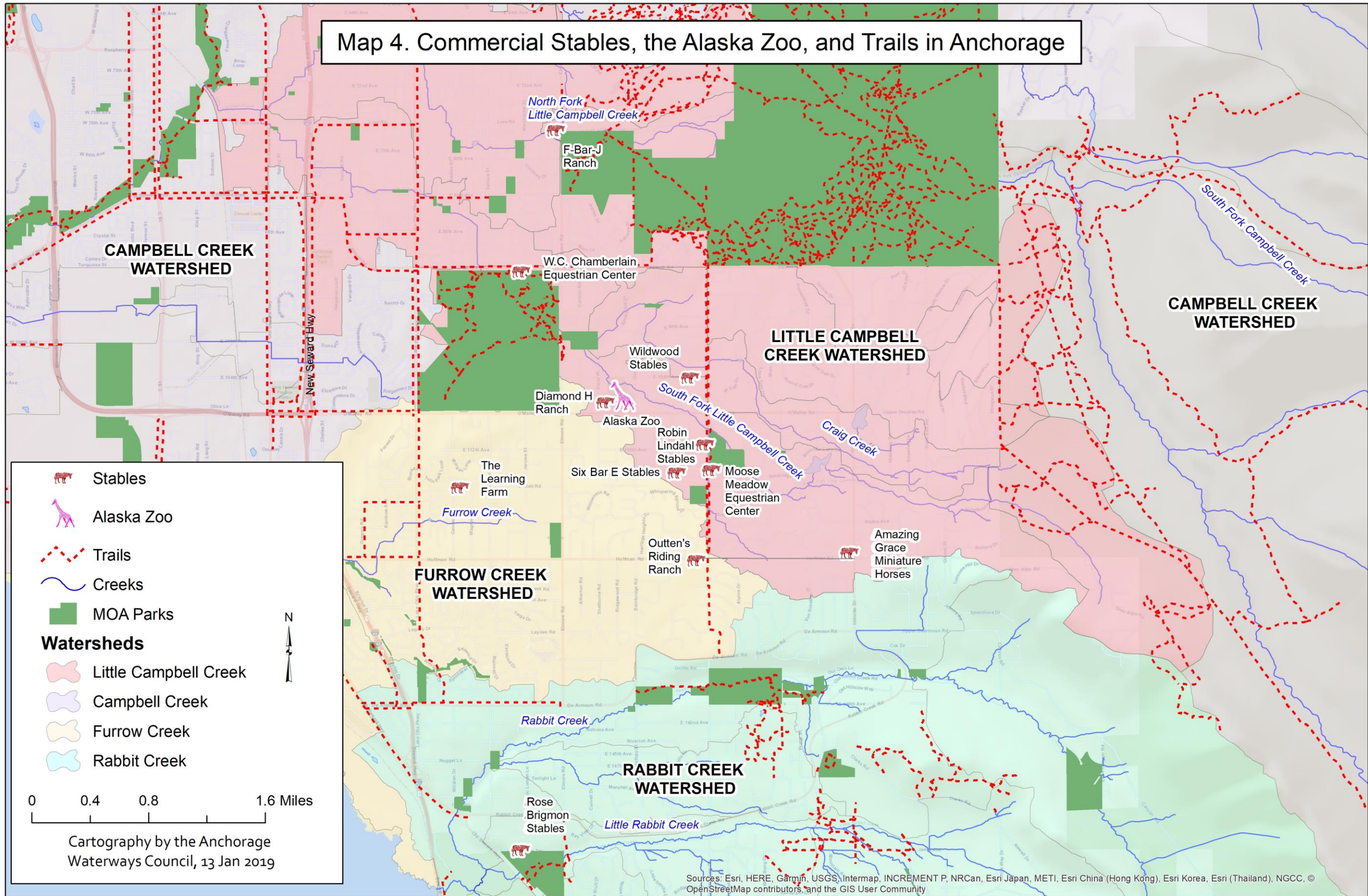
Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community

Map 3. Chugiak and Eagle River Animal Venues

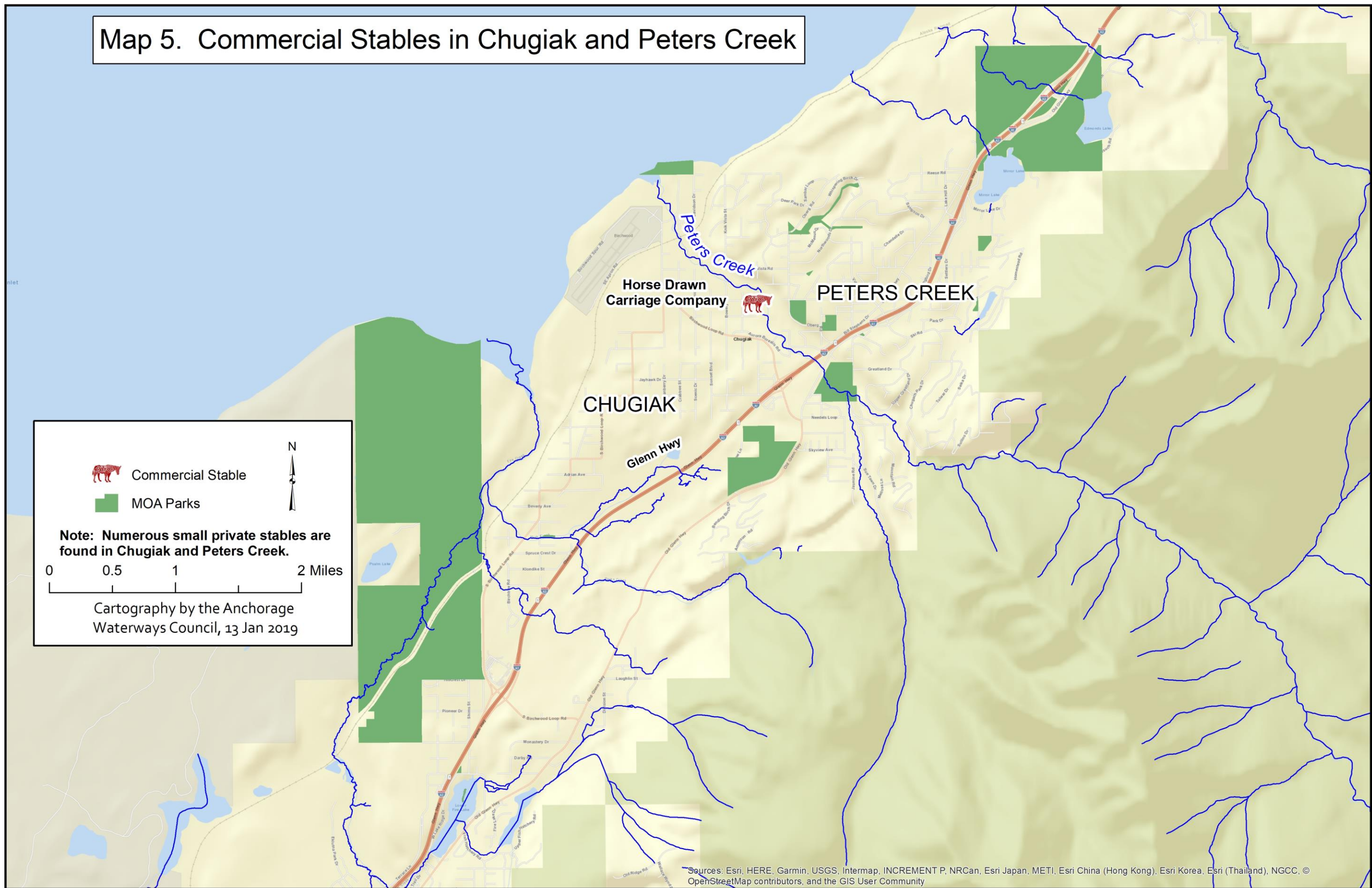


Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community

Map 4. Commercial Stables, the Alaska Zoo, and Trails in Anchorage



Map 5. Commercial Stables in Chugiak and Peters Creek



Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community

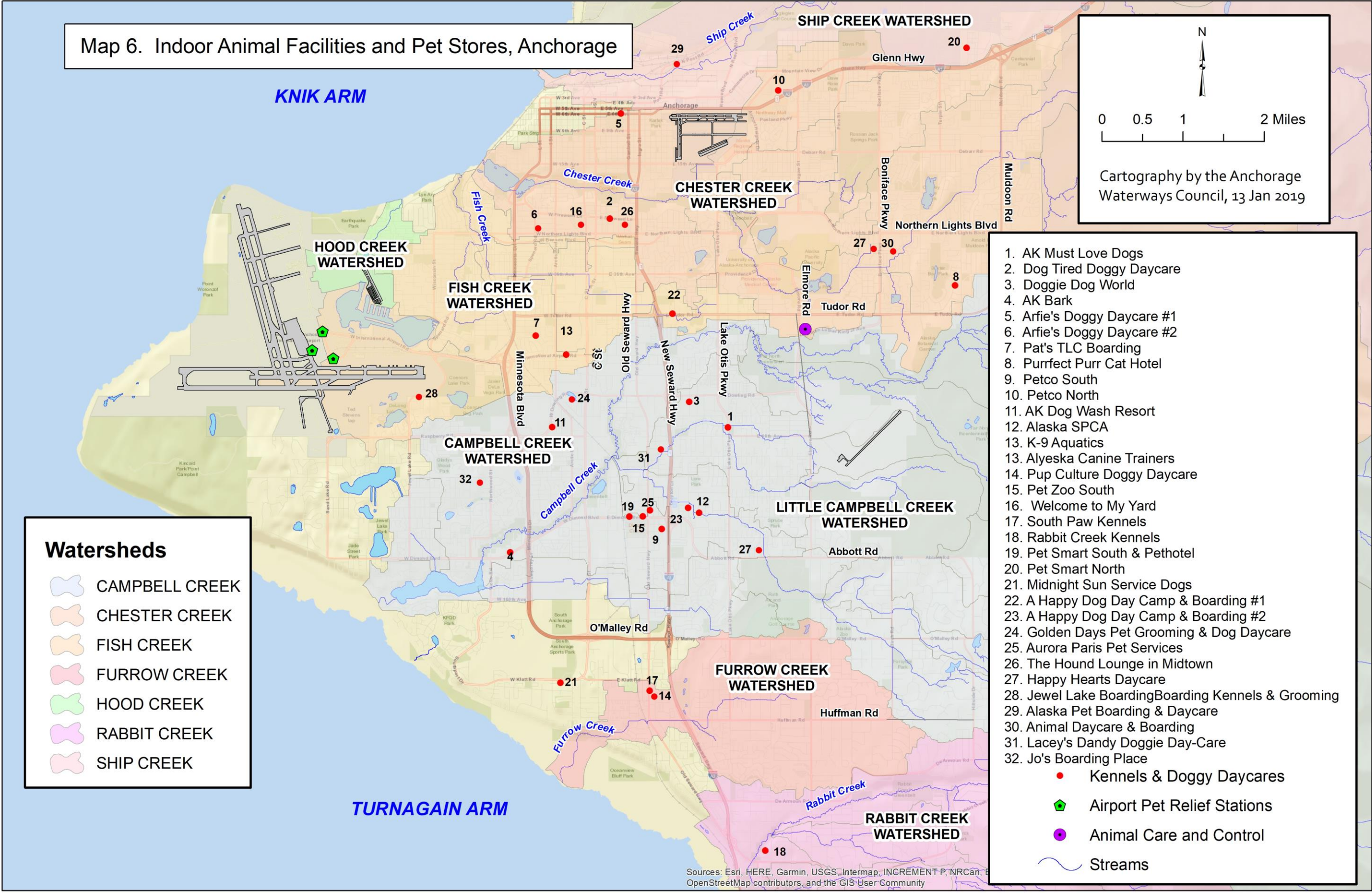
Map 6. Indoor Animal Facilities and Pet Stores, Anchorage

Cartography by the Anchorage Waterways Council, 13 Jan 2019

Watersheds

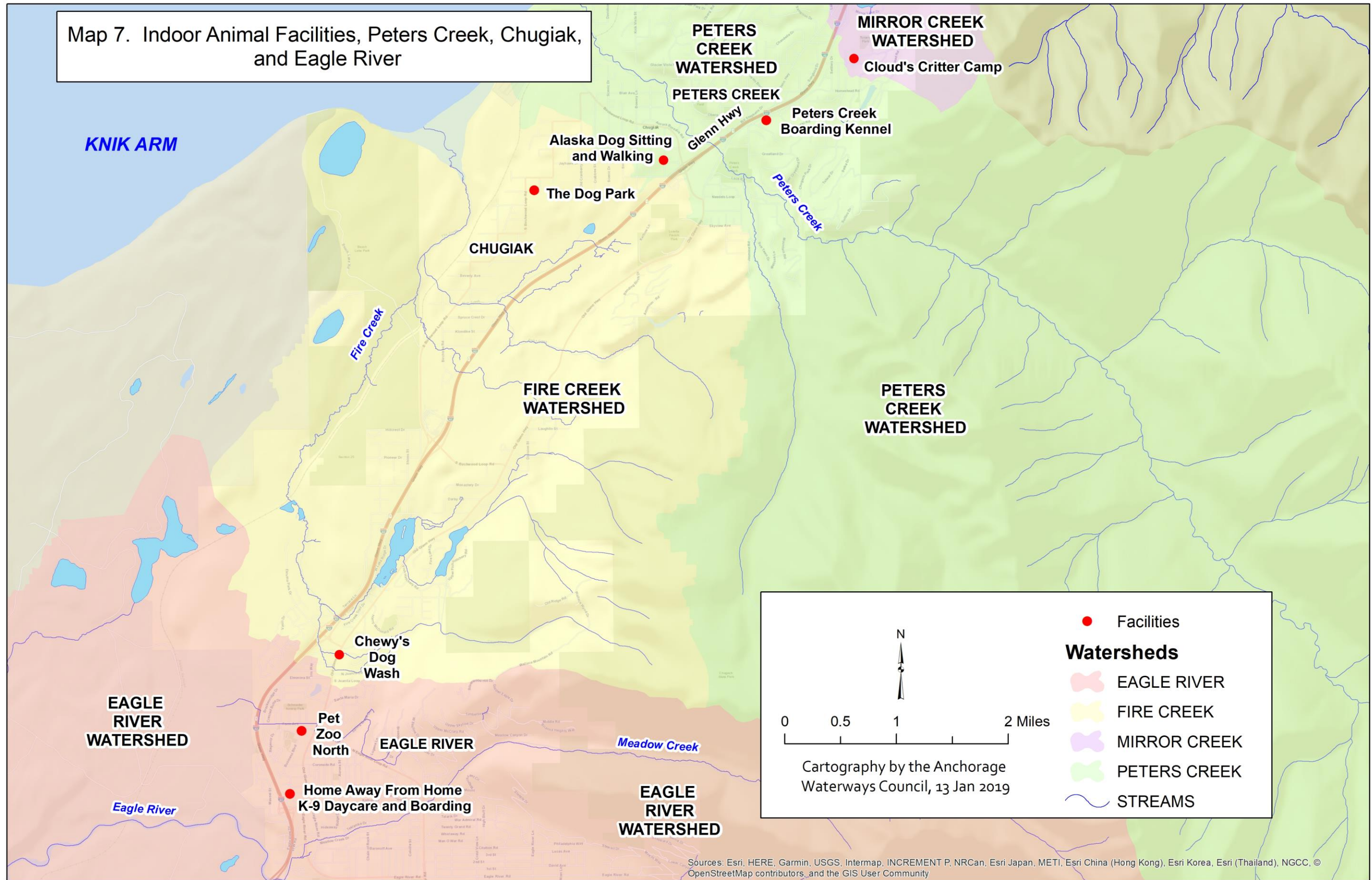
- CAMPBELL CREEK
- CHESTER CREEK
- FISH CREEK
- FURROW CREEK
- HOOD CREEK
- RABBIT CREEK
- SHIP CREEK

1. AK Must Love Dogs
 2. Dog Tired Doggy Daycare
 3. Doggie Dog World
 4. AK Bark
 5. Arfie's Doggy Daycare #1
 6. Arfie's Doggy Daycare #2
 7. Pat's TLC Boarding
 8. Purrfect Purr Cat Hotel
 9. Petco South
 10. Petco North
 11. AK Dog Wash Resort
 12. Alaska SPCA
 13. K-9 Aquatics
 13. Alyeska Canine Trainers
 14. Pup Culture Doggy Daycare
 15. Pet Zoo South
 16. Welcome to My Yard
 17. South Paw Kennels
 18. Rabbit Creek Kennels
 19. Pet Smart South & Pethotel
 20. Pet Smart North
 21. Midnight Sun Service Dogs
 22. A Happy Dog Day Camp & Boarding #1
 23. A Happy Dog Day Camp & Boarding #2
 24. Golden Days Pet Grooming & Dog Daycare
 25. Aurora Paris Pet Services
 26. The Hound Lounge in Midtown
 27. Happy Hearts Daycare
 28. Jewel Lake Boarding Boarding Kennels & Grooming
 29. Alaska Pet Boarding & Daycare
 30. Animal Daycare & Boarding
 31. Lacey's Dandy Doggie Day-Care
 32. Jo's Boarding Place
- Kennels & Doggy Daycares
 - Airport Pet Relief Stations
 - Animal Care and Control
 - Streams



Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, OpenStreetMap contributors, and the GIS User Community

Map 7. Indoor Animal Facilities, Peters Creek, Chugiak, and Eagle River



Bibliography

Alaska Department of Environmental Conservation. 2015. Anchorage Municipal Separate Storm Sewer System Individual Permit AKS052558. At anchoragestormwater.com/Documents/apdes/AKS052558_MOA_MS4_2015_FP.pdf

HDR Alaska, Inc. 2008. South Fork Little Campbell Creek Fish Passage Assessment in The Vicinity of the Alaska Zoo: Summary Report. Prepared for: USFWS, 608 West 4th Avenue, Anchorage, AK 99501.

Municipality of Anchorage. 2003. Codified Title 17 – Animals. At [muni.org/Departments/health/Admin/animal_control/Documents/Codified%20Title%2017%20\(54%20page%20PDF\).pdf](http://muni.org/Departments/health/Admin/animal_control/Documents/Codified%20Title%2017%20(54%20page%20PDF).pdf)

Pennsylvania State University Extension. 2016. *Some Facts About Horse Manure*. At extension.psu.edu/horse-stable-manure-management

2018 Educational Outreach Activities

Volume 4, Issue 4 | July 2018

PADDLE

ACA | Canoe - Kayak - SUP - Raft - Rescue

ACA launches fundraiser for whitewater slalom

Whitewater Raft Adaptive Paddling Workshop

Chile Workshop Sees Promising Instructors

Instructors of the Month



Volume 4, Issue 2 | March 2018

PADDLE

ACA | Canoe - Kayak - SUP - Raft - Rescue

Plastics vs. Water

Bringing Awareness to the Challenge

Learn about FreeStyle Canoeing

ACA Sponsors Environmental Film Category

Instructor of the Month – January & February



MICROFIBERS:

Another form of plastic pollution affecting waterways, oceans

By Cherie Northon, Ph.D., Executive Director, Anchorage Waterways Council

Recently, another pressing and insidious problem regarding the effects of plastic in freshwater and marine environments has been making the news: Microfibers. Pretty much invisible to the human eye, they have been found in fresh and marine ecosystems and some of the products that we consume, such as [fish](#), [shellfish](#), and [sea salt](#).

Microfibers are a very fine synthetic yarn whose strands have a diameter of less than one denier (or ten micrometers), which is approximately 1/5 the diameter of a human hair. They are used to make certain products, including much of our favorite active

wear—running shorts, yoga pants, and fleece jackets. The primary textiles that shed microfibers are nylon, polyester, rayon, acrylic and spandex, which are very popular due to being lightweight, resistant to wrinkling and pilling, breathable, comfortable, and having better thermal insulation.

Although microfibers have been around since the late 1950s, their use in clothing, furniture fabric, and in household items did not really take off until the 1990s. Polyester, spandex, and polar fleece are especially popular, and we have become greatly dependent on them. I love my 20-year-old bright yellow Eddie Bauer EBTEK



Microfibers photographed in an oyster from Apalachicola Bay, FL, 2015. Photo courtesy Robert Simmons, Ph.D. (microscopy@briarwillow.com)



The author in the Falkland Islands with Gentoo penguins attracted to her favorite yellow fleece, 2007. Photo courtesy Thom Eley, Ph.D.

pullover fleece, which has racked up tens of thousands of world travel miles with me (when I fly, it goes), yet, sadly, fleece is one of the worst offenders for releasing microfibers. And, it's been found that the older the garment—the more likely it is to shed microfibers.

How does my fleece pullover impact marine and fresh-water habitats? Whenever items containing microfibers go through the washing machine, they release thousands of microscopic plastic fibers, known as microfibers. From the laundry they travel into septic systems or wastewater treatment plants. Though it is estimated that wastewater treatment plants can capture 62-92% of the microfibers, an enormous number are finding their way into fresh and saltwater ecosystems in the discharged effluent and on land from wastewater sludge that is often used as a fertilizer.

Aside from abandoning some of our favorite clothes and items, what can we do?

Two global fixes to the microfiber problem that have been proposed are major and very costly. One is to upgrade wastewater treatment plants to trap and better retain microfibers, and the other is for a change in the textile and clothing industry to move away from microfiber fabrics. If instituted, these changes will take time, money, an attitude shift, and a huge buy-in by producers and consumers. In the meantime, here are some things each of us can do:

- Wash synthetic clothes less frequently and for a shorter cycle.

(Continued on page 19)



A new Guppy Friend bag. (guppyfriend.com)



Microfibers collected in the Guppy Friend bag.
Photo courtesy Beth Terry (myplasticfreelife.com)

- Fill up your washing machine. Washing a full load results in less friction between the clothes and fewer fibers are released.
- If you use powdered detergent, consider switching to a liquid laundry soap. Laundry powder causes more scrubbing, which loosens more microfibers.
- Use a colder wash setting. Higher temperatures can damage clothes and release more fibers.
- Spin dry clothes at low revolutions. Higher revolutions increase the friction between the clothes.
- When you clean out your washer and dryer filters, place lint in the trash instead of washing it down the drain (which would defeat the whole purpose).
- If you are in the market for a new washer, consider a front loading model. Studies have shown that front loading washers cause significantly less microfiber shedding than top loading washers.
- You can purchase a special microfiber filter for your washer. Although they require more of an investment, there are several models on the

Internet with prices around \$150, and they are also helpful for reducing septic system/drain-field failures and clogged drains.

- Consider buying a Guppy Friend wash bag. During testing, the bag captured 99 percent of fibers released in the washing process. The bags are available for purchase at Patagonia for around \$30. They measure about 20” x 30” and are perfect for a few items. [Beth Terry](#), a plastic pollution activist, reviewed the [Guppy Friend bag](#) and recovered a small amount of fiber lint left in the bag after a washing cycle. Remember, these are microfibers, so don’t expect a huge ball of fuzz.
- What about larger item such as sheets, blankets, or pet beds? Another product on the market might fill that gap—the [Cora Ball](#), whose design is based on how coral filters water. All you need to do is toss one into your washing machine with a load of clothes.



According to their inventors, “Cora swooshes around in the laundry and just like coral, allows water to flow, while picking up those little pieces of microfiber and catching them in her stalks”. And, of course, remove the Cora after

washing and clean it when there's an accumulation of lint (not necessarily after every wash). Again, remember to put the lint in the trash, not down the drain.

- Think more carefully about what you own (and wash) that is made of synthetics. As an example, fleece typically brings to mind jackets or pullovers. Around my house I found socks, slippers, caps, vests, pants, blankets, throws, and pet beds. Microfiber bed sheets now fill store shelves, and are getting rave reviews including recent [publicity](#) from NBC's *Today Show*. Who wouldn't be swayed by the fact that they are soft, cool, wrinkle-free, and run about \$30 a set? Too bad the review didn't mention the downside of microfiber products.
- Consider switching to products that are made from natural fibers, such as cotton, linen (flax), and wool. There is a different set of environmental concerns, which means tradeoffs. Both linen and cotton (especially) require large inputs of water and chemicals (fertilizers and pesticides), although linen tends to be less de-

manding. And, of course, while sheep's wool is a renewable resource, there are environmental downsides to raising large animal herds. Hemp and bamboo, also made into bed sheets, are gaining more recognition and acceptance, which would be good, natural alternatives. However, currently they cannot compete with the low cost of microfiber sheets.

To an improved future...

It is my hope that the information in this and my earlier article, *Plastics vs. Waterways* ([March 2018](#)) will acquaint readers with the less well-known impacts of plastic on the aquatic environment. Our entire relationship with plastic is complex; some aspects have fairly simple remedies while others are not easily resolved. The products we purchase, the lifestyles we lead, and the regard we have for minimizing the very negative environmental effects of plastics are all important. Certainly there is much room for improvement to try and minimize many of the consequences. We can only do better by being informed about human-made environmental disasters, such as plastic pollution in freshwater and the oceans, and by taking steps to help mitigate our personal impact.



Tossing the Cora Ball into the washer.
Photos courtesy Cora Ball ([Coraball.com](#))

About the Author

Cherie Northon has a master's and a doctorate in Geography from the University of California Berkeley, where she taught for 19 years. She is also a cartographer – working in GIS, remote sensing, and GPS-acquired data. Her areas of interest are habitat protection and improvement of the natural environment (flora and fauna), student outreach (K-12), and generating public participation in environmental issues. She has been the executive director of Anchorage Waterways Council since 2010.

Plastic vs. Waterways

Most everyone reading this knows that plastics are bad for freshwater and saltwater critters and their habitats. So, how did we get into this predicament? How bad is it? And, what can we do to mitigate the problem?

The rise of plastics and how they helped us become a throwaway society

On August 1, 1955, *Life Magazine* published an article called “Throwaway Living—Disposable Items Cut Down Household Chores” (p. 43). An interesting photo appeared on the lead page depicting a family tossing several ordinary household items into the air that represented at least 40 hours of work for a housewife (and yes, we were not such an enlightened bunch back then) to clean. The point was to illustrate that if a person did not have to bother cleaning certain things, they would have much more free time. Considering the extensive conscientiousness of saving and reusing items following the Great Depression and World War II, this was a pretty radical departure only a decade after the war’s end.

The article highlighted some of the items that now make life easier: plastic plates, cups, cutlery, table cloths, and flowers; popcorn sold in a toss-away pan [Jiffy Pop], disposable diapers, and even throwaway draperies. Also shown is a pet feeding bowl on a wrought-iron stand with disposable, waterproof bowls that “eliminate washing-up chores.” The stand and six bowls could be

had for only \$1. There’s a “disposa-pan,” which meant no more scouring pots after cooking, that contained a steel frame and eight heavy disposable foil pans for a mere \$2.98. And more ambitious was an entire throw-away barbecue that came with a stand, an *asbestos* shell, a wire grill, and an hour’s worth of charcoal – all for 79¢.

Plastics do provide [benefits](#) to our lives in several ways, and some of them are essential. Conversely, many uses for plastic are detrimental and unnecessary as has been discovered over the past decades. About 15 years after the *Life Magazine* article, the environmental movement began to focus on the problems of excess production and waste and the benefits of recycling. At the time, this was not a bad solution. However, as we know today, recycling is no longer the panacea – especially in light of China’s January 1, 2018, [ban](#) on importing half the world’s recycling waste. Today, [recyclables are piling up in overwhelming numbers](#) throughout North America, Europe, and other locations, and it’s too late to put the genie back in the bottle. So what do we do? And, what does this have to do with water? As we’ll see, a lot!

Plastic and watersheds

Many find it difficult to comprehend that every person on Earth lives in a watershed. The U.S. Geological Survey defines a [watershed](#) as “the area of land where all of the water that falls in it and drains off of it goes to a

common outlet...Watersheds are important because the streamflow and the water quality of a river are affected by things, human-induced or not, happening in the land area ‘above’ the river-outflow point.”

In this context, **what’s on the ground, washes down** – to a stream, a lake, a bay, or an ocean – meaning unwanted items are carried downhill through a watershed until they eventually make their way to one of the great ocean trash [gyres](#). These gyres hold enormous

Washed-up plastic parts, including several BIC “disposable” lighters, litter the ground at Eastern Island at Midway Atoll-Washed. C. Northon photo





A Laysan Albatross feeding its chick on Midway Island. C. Northon photo.



The carcass of a Laysan Albatross found on Midway Island shows that the bird had ingested various forms of plastic. Chris Jordan photo

amounts of garbage – of which most is plastic – and it’s estimated that 80 percent of the contents originate on land as opposed to being dumped from ships at sea.

Bits & Pieces, Nurdles, and Microbeads

Because of the accelerating demand for plastics, increased production over the recent decades, and its hardness (difficulty in breaking down), the problem is ubiquitous. Most plastics are not biodegradable, but, instead, they break into smaller and smaller “bits and pieces” over time, and [they never truly go away](#) – well, at least they haven’t in our lifetime. These objects can resemble colorful confetti, and this, unfortunately, attracts sea birds because they think it’s food. Also, filter feeders, from clams to whales, strain the waters and consume many of the plastic fragments.

These plastic bits affect some of the most remote areas of the world, such as Midway Atoll which lies about 1,300 miles northeast of Honolulu. Laysan albatross and other sea birds, green sea turtles, and Hawaiian monk seals are found on Midway and Eastern Islands. Sadly, Midway is also a place of death for many of the albatross who ingest or are fed plastic by their parents, because it resembles fish eggs, plankton, and other food particles. Ultimately, their stomachs fill up, and they starve to death.

Nurdles are another overwhelming problem for aquatic organisms. These are the building blocks, the raw material, for most of our plastic products. How, then,

do they get in our waters? This happens mostly from spills at factories (about 80 percent) and the rest at sea, when containers full of nurdles go overboard. There have been two rather massive spills from just a few shipping containers over the last five years. One spill in Hong Kong during July 2012 involved six containers releasing 150 tons of nurdles, and the other in Durban Harbour during October 2017 is estimated to have released 49 tons from two containers. This equates to billions of nurdles (average count of nurdles per ton is ~ 50,000,000). And since both of these spills were close to fishing grounds and fish farms, the immediate impact of ingestion was able to be observed. It is known that eating fish and sea food contaminated with nurdles is harmful to humans.

(Continued on page 19)



Nurdles or pre-production plastic pellets found on a beach in Hawaii. NOAA photo



Microbeads seen as specks in toothpaste.



*Microbeads that have been filtered out of toothpaste.
NOAA photos*

And, let's not forget microbeads.

Introduced in 1972 as an additive to personal care products, such as facial scrubs and toothpaste, they are, despite their minute size, something that can kill marine life. Our waters are laden with high concentrations of them which are also attractive as food to aquatic critters. Unfortunately, they are so small that even our most sophisticated waste water treatment plants cannot filter them all out, and eventually the toxic sludge they create needs to be cleaned up. Where will the sludge go? Undoubtedly, to landfills.

Alarmingly, some of the fish and seafood we eat are now carrying pollutants that have adhered to the microbeads before being ingested. Microbeads are not only harming aquatic organisms, but they are working their way up the food chain to us! And, recent [studies](#) have found that they are entering our drinking water sources. In December 2015, Congress amended the Federal Food, Drug, and Cosmetic Act by passing the [Microbead Free Waters Act of 2015](#), which will phase out their manufacture and use over the next few years, but they remain out there in the environment. You can't call them back.

A Common Loon floats on Jewel Lake near Anchorage with monofilament wrapped around its beak. C. Northon photo.

But wait, there's more!

Plastic bits are not the only problem to contend with. Discarded fishing line, commonly known as monofilament, is a tremendous hazard to fish and wildlife. Birds, especially, are injured or killed from this essentially invisible trap. Often the line will have hooks and weights on it that are also ingested. In 2015, Anchorage Waterways Council established the first monofilament collection and recycling program in Anchorage. Since then hundreds of miles of line have been sent back to [Berkley Industries](#) for recycling and repurposing. AWC recently submitted a grant to expand the program and to work on reducing Alaska's "plastic" footprint. An excellent video by University of Alaska Anchorage Conservation Biology students was created in 2017 on this problem titled, [The Dangers of Monofilament](#), and it was filmed right here on Anchorage's urban creeks. Check it out!



And let's not forget cigarette butts!

[Dr. Thomas Novotny](#), a renowned opponent of tobacco and cigarette butt waste recently wrote, “[u]sed cigarette butts are not just pieces of non-biodegradable plastic. They also contain the carcinogens, nicotine and toxins found in all tobacco products. We have found that one cigarette butt soaked in a litre of water for 96 hours leaches out enough toxins to kill half of the fresh or salt water fish exposed to them.”



The ground around this bench at University Lake, Anchorage, is littered cigarette butts. C. Northon photo

Cigarette butts and their 95 percent [plastic-based filters](#) are the most common litter item during cleanups by the Ocean Conservancy as noted in their [2017 report](#) when nearly 2 million were picked up. Birds and fish swallow them, they add carcinogens to water, and they are unsightly on the ground.

It's difficult to not notice how many butts are tossed away before entering a building or a vehicle or when sitting on a bench. And from there, it's just a short trip for that butt to the storm drain and into our waterways.



Cigarette butts wash down a storm drain on Tudor Road in Anchorage. C. Northon photo

What are *you* doing in your life to effect change regarding plastic?

In an effort to reduce the impacts of plastic on our waters, Anchorage Waterways Council is implementing dialogue in order for people to become more aware of and examine their personal lifestyle choices and how each and every one of us, while contributors to the problem, can also be part of the solution.

Think about your daily routine. Do you need that straw with your ice tea or soda? Can you remember to carry cloth bags to stores and reduce plastic bag consumption? Maybe suggest to that store clerk who is automatically bagging the one or two items that you purchased that a bag is not necessary. How about buying a reusable water bottle instead of purchasing bottled water? Pay attention to the types of takeout containers that restaurants use – plastic foam or compostable paper? What other things in your life can you change? Try a bamboo toothbrush or reusable food storage wraps. There are so many ways that each of us can make a dent in this overbearing problem.

About the Author

Cherie Northon has a master's and a doctorate in Geography from the University of California Berkeley, where she taught for 19 years. She is also a cartographer – working in GIS, remote sensing, and GPS-acquired data. Her areas of interest are habitat protection and improvement of the natural environment (flora and fauna), student outreach (K-12), and generating public participation in environmental issues. She has been the executive director of Anchorage Waterways Council since 2010.

ICE MELT PRODUCTS: How to save money, reduce damage, and protect our waterways this winter!

It's winter in Anchorage, and we are in the midst of many months of snow and ice. For safety, salting and sanding roads, driveways, and walking areas is necessary. Unfortunately these chemicals and traction materials will flow into our creeks and streams during spring breakup by way of stormwater runoff.

Studies point to the economic value for businesses to keep their watersheds and the associated waterways healthy. While this care needs to occur year-round, winter poses special challenges because of ice melt chemicals and aggregate. They need to be used properly.



Ineffective and wasteful application of ice melt product



Proper amount and placement combined with traction material

Snow and ice melt products work by creating a brine on the surface which makes it easier to shovel by breaking the bond between snow and ice and the surface.



To save money and help our creeks, keep these considerations in mind:

- ❄ Spread ice melt **BEFORE** snowfall.
- ❄ Read all directions **PRIOR** to application.
- ❄ If it has already snowed, shovel areas clear before applying ice melt products.
- ❄ Use the proper amount--more is **NOT** better!
- ❄ Handle safely and avoid areas that could be harmed.
- ❄ Use with traction products to reduce the amount of chemicals needed.
- ❄ Before you purchase, compare the available types in regard to temperature limits, corrosiveness, cost, and impacts on humans, pets, vehicles, and the environment.

Anchorage Waterways Council
protecting local creeks and lakes since 1984.

For more information:

907-272-7335 or anchoragecreeks.org



PROTECTING OUR WATERWAYS AND WATERSHEDS IS GOOD FOR BUSINESS AND THE ECONOMY!

Healthy, intact watersheds and clean waterways are highly beneficial to Anchorage's social and economic well-being, especially in regard to tourism.

Profitable returns are seen in:

- S Sales
- S Tours and guiding
- S Hospitality (hotels, cabins, restaurants, etc.)
- S Equipment rentals
- S Licenses, fees, permits and taxes



Potter Marsh



Lake Hood



Ship Creek



Campbell Creek

How to have healthy creeks and watersheds:

- S Keep vehicles well maintained to eliminate fluid drips
- S Reduce or eliminate landscaping chemicals
- S Clean up litter, cigarette butts, pet waste, and fishing line
- S Allow only clean water down storm drains
- S Install a rain garden

Anchorage Waterways Council-- *keeping Anchorage's creeks clean since 1984!*

anchoragecreeks.org

(907) 272-7335





JOIN or RENEW NOW

AWC UPDATE February 15, 2018:

A message from the Executive Director, Cherie Northon

Apologies for the hiatus between newsletters as the past couple of months have been extremely busy. An annual report regarding our participation on the Municipality's APDES (Alaska Pollutant Discharge Elimination System) permit was due at the same time as a comprehensive grant to NFWF (National Fish and Wildlife Foundation).

The NFWF grant that focused on problems with plastics was very interesting to research and write, so I thought I would share some of it with you. I was motivated to make additional changes in my daily life, and hopefully you will be inspired also.

What the heck does "Plastics vs. Waterways" mean?

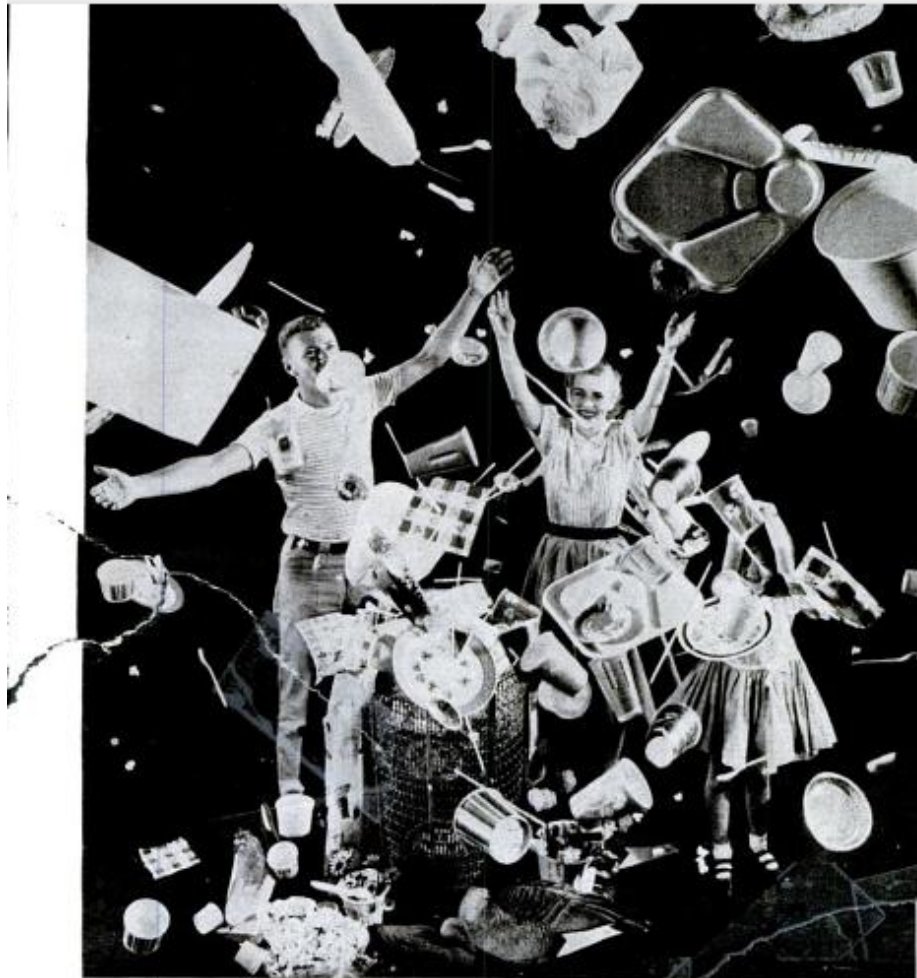
Most everyone reading this knows that plastics are bad for freshwater and saltwater critters and habitats. So, how did we get into this predicament? How bad is it? And, what can we do to mitigate the problem?

How and when did we become a *throwaway* society?

On August 1, 1955, *Life Magazine* published an article called "Throwaway Living". The main point was that if we were not wasting hours cleaning some ordinary household items, our lives could be so much easier and we would have much more "free" time. Incredibly, the author actually came up with an estimate of 40 hours for a housewife (and yes, we were not such an enlightened bunch back then) to clean the items shown in the following picture that could now simply be tossed away. Considering the extensive conscientiousness of saving and reusing items following the Great

Depression and World War II, this was a pretty radical departure only a decade after the War's end.

August 1, 1955, *Life Magazine*



Throwaway Living

DISPOSABLE ITEMS CUT DOWN HOUSEHOLD CHORES

The objects flying through the air in this picture would take 40 hours to clean—except that no housewife need bother. They are all meant to be thrown away after use. Many are new; others, such as paper plates and towels, have been around a long time but are now being made more attractive.

At the bottom of the picture, to the left of a New York City Department of Sanitation trash can, are some throwaway vases and flowers, popcorn that pops in its own pan. Moving clockwise around the photograph come assorted frozen food containers,

a checkered paper napkin, a disposable diaper (seriously suggested as one reason for a rise in the U.S. birth rate) and, behind it, a baby's bib. At top are throwaway water wings, foil pans, paper tablecloth, guest towels and a sectional plate. At right is an all-purpose bucket and, scattered throughout the picture, paper cups for beer and highballs. In the basket are throwaway draperies, ash trays, garbage bags, hot pads, mats and a feeding dish for dogs. At the base of the basket are two items for hunters to throw away: disposable goose and duck decoys.

CONTINUED

DISPOSABLE ITEMS CUT DOWN HOUSEHOLD CHORES

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At the bottom of the picture to the left of a New York City Department of Sanitation trash can ,are some throwaway vases and flowers, popcorn that pops in its own pan [Jiffy Pop]. Moving clockwise around the photograph come assorted frozen food containers, a checkered paper napkin, a disposable diaper (seriously suggested as one reason for a rise in the U.S. birth rate) and, behind it, a baby's bib. At top are throwaway water wings, foil pans, paper tablecloth, guest towels and a sectional plate. At right is an all-purpose bucket and, scattered throughout the picture, paper cups for beer and highballs. In the basket are throwaway draperies, ash trays, garbage bags, hot pads, mats and a feeding dish for dogs. At the base of the basket are two items for hunters to throw away: disposable goose and duck decoys.



FEEDING BOWL for pets comes with a wrought-iron stand and disposable, waterproof bowls to eliminate washing-up chore. Stand and six dishes cost \$1.

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DISPOSA-PAN eliminates scouring of pots after cooking. It consists of steel frame and heavy foil pans to throw out. Frame with eight pans is \$2.98.

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BARBECUE GRILL is meal cooker with stand, asbestos shell and wire grill, charcoal to last one hour and excelsior topping for a quick light. It costs 79¢.

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Plastics do provide [benefits](#) to our lives in several ways, and some of them are essential. Conversely, many uses for plastic are detrimental and unnecessary as has been discovered over the past decades. About 15 years after the *Life Magazine* article, the environmental movement began to focus on the problems of excess production and waste and the benefits of recycling. At the time, this was not a bad solution. However, as we know today, recycling is no longer the panacea--especially in light of China's January 1, 2018, [ban](#) on importing half the world's recycling waste. As of this writing, [recyclables are piling up in overwhelming numbers](#) throughout North America, Europe, and other locations, and it's too late to put the genie back in the bottle. So what do we do? And, what does this have to do with water? As we'll see, a lot!

Every person on the Earth lives in a watershed!

Many find this difficult to comprehend, but each and every one of us lives in a watershed. The U.S.G.S. defines a [watershed](#) as " the area of land where all of the water that falls in it and drains off of it goes to a common outlet...Watersheds are important because the streamflow and the water quality of a river are affected by things, human-induced or not, happening in the land area 'above' the river-outflow point."

In this context, **what's on the ground, washes down**--to a lake, a bay, or an ocean meaning unwanted items are carried downward through a watershed

until much eventually ends up in one of the great ocean trash [gyres](#). These gyres hold enormous amounts of trash, which are mostly plastic, and 80% of their contents are theorized to come from land as opposed to ships dumping at sea.

Bits & Pieces, Nurdles, and Microbeads

Because of the high demand for plastics, increased production over the recent decades, and its hardness (difficult to break down), the problem is ubiquitous. Most plastics are not biodegradable, but, instead, they break into smaller and smaller bits and pieces over time--and [they never truly go away](#)--well, at least not in our lifetime. These objects can resemble colorful confetti, and this, unfortunately, attracts sea birds who think it is food. Also, filter feeders from clams to whales strain the waters and consume much of the plastic fragments.

These plastic bits affect some of the most remote areas of the world, such as Midway Atoll which lies about 1,300 miles northeast of Honolulu. Laysan albatross and other sea birds, green sea turtles, and Hawaiian monk seals are found on Midway Island and Eastern Island. Sadly, Midway is also a place of death for many of the albatross who eat or are fed plastic by their parents because it resembles fish eggs, plankton, and other food bits. Ultimately, their stomachs fill up, and they starve to death.



Midway Island, Laysan Albatross. Photo courtesy of [Chris Jordan](#) (2009).



Laysan albatross feeding chick on Midway Island. Photo by C. Northon (2012).



Eastern Island--washed up plastic parts including several BIC "disposable" lighters.
Photo by C. Northon (2012).

Another overwhelming issue for aquatic organisms are nurdles. These are the building blocks, the raw material, for most of our plastic products. How, then, do they get in our waters? This mostly happens from spills at factories and other locations and at sea (containers full of nurdles falling overboard).



Nurdles or pre-production plastic pellets found on a beach in Hawaii. Photo by NOAA.

And, let's not forget microbeads. Introduced in 1972 as an additive to personal care products, such as facial scrubs and toothpaste, they are, despite their minute size, something that can kill marine life. Our waters are laden with high concentrations of these which are attractive as food to aquatic critters. They are so small that even our most sophisticated waste water treatment plants cannot filter them all out, and eventually the toxic sludge they create needs to be cleaned up. Where will it go?

Sadly, some of the fish and seafood we eat are now carrying pollutants that have adhered to the microbeads before being ingested. Microbeads are not only harming aquatic organisms, but they are working their way up the food chain to us! And, [studies](#) have found that they are entering our drinking water sources. In December 2015, Congress amended the Federal Food, Drug, and Cosmetic Act by passing the [Microbead Free Waters Act of 2015](#), which will phase out their manufacture and use.



Microbeads seen as specks in toothpaste. Photo by NOAA.



Microbeads that have been filtered out of toothpaste. Photo by NOAA.

But wait, there's more!

There are other problems to contend with besides plastic bits. Discarded fishing line, known as monofilament, is a tremendous hazard to fish and wildlife. Birds, especially, are injured or killed from this essentially invisible trap. Often the line will have hooks and weights on it that are ingested. In 2015, AWC established the first monofilament recycling program in Anchorage, and hundreds of miles of line have already been sent back to Berkley Industries for recycling. We recently submitted a grant to expand the program. Following is a map of the current locations. And, if you want to see an excellent UAA student video on this problem, click this link: [The Dangers of Monofilament](#) (2017). It was filmed right here on our local creeks!



Monofilament Recycling Bins in the Municipality. Map by Thom Eley (2015).



Common Loon with monofilament wrapped around its beak, Jewel Lake. Photo by C. Northon (2014).

And, finally, let's not forget cigarette butts!

Dr. Thomas Novotny who spoke at AWC's 2012 Annual Meeting, recently wrote, "[u]sed cigarette butts are not just pieces of non-biodegradable plastic. They also contain the carcinogens, nicotine and toxins found in all tobacco products. We have found that one cigarette butt soaked in a litre of water for 96 hours leaches out enough toxins to kill half of the fresh or salt water fish exposed to them."

Cigarette butts and their 95% [plastic-based filters](#) are the most common litter item during cleanups by the Ocean Conservancy as noted in their [2017 report](#) when nearly 2 million were picked up. Birds and fish swallow them, they add carcinogens to water, and they are unsightly on the ground.

The effects of tossing a butt away before entering a building or a vehicle or when sitting on a bench are seen everywhere. And it's just a short trip to the stormdrain and into our waterways.



Bench at University Lake with cigarette butt litter.

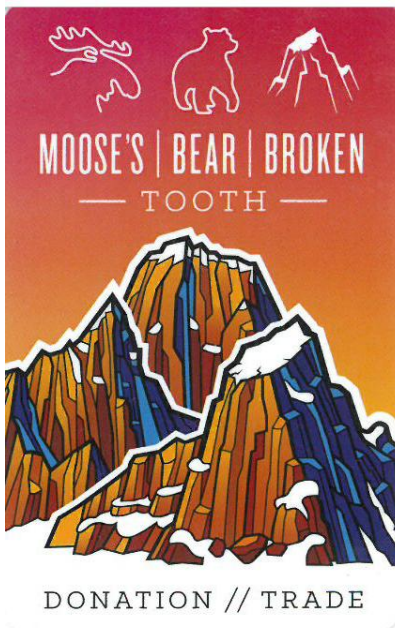


Storm drain on Tudor with cig butts washing down. Photo by C. Northon.

What are you doing in your life to effect change regarding plastic?

We at AWC would like to hear from you. Drop us an [email](#) and tell us about a change you've made to reduce your plastic impact. All submissions will be

reviewed and legitimate responses will be entered into a random drawing for one of three \$25 gift certificates usable at Moose's Tooth or Bear Tooth.



HOW YOU CAN HELP AWC MAINTAIN HEALTHY CREEKS

Pick, Click, Give is back. Thank you to all who contribute to AWC and the other deserving charities.

Pick.Click.Give.

[Link](#) your **Fred Meyer** rewards card to Anchorage Waterways Council (88984).

Use **Amazon Smile** when you make purchases. charities. This [link](#) will take you right there!

Volunteer

There are many ways to help AWC as a volunteer. We have fantastic volunteers who donate hundreds of hours annually to monitor our creeks each month, hundreds of participants take to the creeks every May to pull tons of trash out during our Annual Creek Cleanup, and many of you are "eyes on the creek"--reporting things that are disturbing--and we do our best to respond or help people find the right place to "complain". Consider

becoming an AWC board member! AWC is a 501 (c) 3 non-profit and memberships and donations (monetary or items) are tax deductible.

AWC Membership--Renew or Join!

Being a member of AWC means that you care passionately about the well-being of your own environment. We work to keep the waterways clean, clear, and of value to all. From clean water and recreation to creating a general feeling of well-being, our waterways need protecting for our own benefit, as well as for the countless other species that rely on them. Adding your name to our membership means we can make a stronger stand when it comes to the issues that can affect us all--use your vote and become a member today!

It's easy, you can go online at www.anchoragecreeks.org and click the "**JOIN NOW**" button, to join, renew or donate, or click the "**Join or Renew Now**" button at the top of this email. We are now set up to do recurring payments as well! This can be as simple as \$5 or \$10 a month, but it adds up BIG for us.

If you have a question about your membership and when it expires, please contact us at awc@anchoragecreeks.org. If you know someone who wants to help support our great waterways, please forward this email to them, or if you want to provide a gift membership--contact us. Does your employer have a volunteer match program? Thanks to all for your continuing support and especially to our sponsors and volunteers who watch the waterways, monitor the creeks, and help this great organization--the ONLY one in Anchorage dedicated to protecting our creeks, wetlands, and watersheds.

Reminder: Like AND Follow us on **Facebook** at "[Anchorage Waterways Council](#)" and "[Scoop the Poop Anchorage](#)".

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<http://www.anchoragecreeks.org>
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JOIN or RENEW NOW

AWC UPDATE March 13, 2018:

A message from the Executive Director, Cherie Northon

Finally, we're getting some snow--just as the days are getting longer. Right around the corner has to be breakup. With that, we know there will be a considerable amount of trash and pet waste popping up on the ground and in our creeks and lakes. Spring is when AWC jumps head first into cleaning up after a long winter with our Scoop the Poop Day and 34th annual Creek Cleanup.

Many of you have participated in Creek Cleanup for years as it was started in 1984. It's encouraging to hear from those who cleaned up when they were young and are now doing so with their own children. This is a great legacy of stewardship. Below you will find links for signing up to clean a section of creek or lake. There is also information on our Scoop the Poop Day, where we raise awareness about the need for cleaning up after our pets every day. Plan on attending the Sears Spring Flower and Garden Show on April 7! And finally, our Annual Meeting will be held on April 17th.

SAVE THE DATES!

"Plastics' Impacts on Our Aquatic Environment"

Tuesday, April 17, 6 pm - 8 pm

Resolution Brewing Co.

3024 Mountain View Drive

Plastic is pervasive in our world today--even the most "pristine" areas with few human inhabitants are being deluged with this symbol of modern living and convenience. Please join AWC at our annual meeting which includes three great speakers who will address the issues of plastic and recycling,

marine debris along Alaska's coasts, and the impacts of monofilament on fish and wildlife.

Free appetizers will be provided and Resolution beer on tap will be available for purchase at our informative, fun, and relaxing evening. **Note: age restrictions apply, anyone under 21 must be accompanied by a parent.**

ANCHORAGE WATERWAYS COUNCIL
PRESENTS

**PLASTICS' IMPACTS ON OUR
AQUATIC ENVIRONMENT**

April 17th, 6 PM—8 PM,
Resolution Brewing Co, Anchorage

Speakers

Mary Fisher ALPAR — Recycling in Alaska
The Problem with Plastic and Mixed Paper Recycling—What's next?

Chris Pallister GOAK — Beach Clean-up
Marine Debris along the Northern Gulf of Alaska

Tamara Zeller USFWS — Impacts of Plastics on Birds
The Menace of Monofilament to Waterways and Wildlife

More Info @ - www.anchoragecreeks.org

Sears Mall Annual Spring Flower and Garden Show
Saturday, April 7, 10 am - 5 pm
Sears Mall

Stop by and visit the AWC table. Take a short survey and be entered into a drawing for great gifts. Learn about rain gardens!



"Scoop the Poop" Day
Saturday, April 28

University Lake Dog Park (11-3)

Connors Bog Dog Park (11-3)

NEW DOG PARK! South Anchorage Sports Park (11-1)

For the past several years, volunteers have devoted part of a Saturday during April's "Earth Month" to show their care and appreciation for the privilege of having dog parks in Anchorage. This year it will be held on April 28 at three locations: University Lake, Connors Bog, and the newest dog park at South Anchorage Sports Park (11-1). Buckets, bags, gloves, and gardening tools will be provided. Let's not forget that every day is a Scoop the Poop day, even though our winter snow has hidden much of the pet waste that was not picked up. Remember that each day approximately 20 TONS of pet waste are deposited in Anchorage. If it is not cleaned up, it eventually finds its way into our creeks and lakes and pollutes them with fecal coliform bacteria (*E. coli*). This impairs water quality and can make pets and humans ill. Show your support and come on out and demonstrate that you care for your dog parks.



Mo and Jasper doing their part!

**Adopt a Trail and go on SCAT PATROL
Eagle River Nature Center
Saturday, April 28, and Sunday, April 29, 10-5**

Register at www.ernc.org and adopt your favorite Nature Center trail. They'll provide bags and tools for clean-up on April 28 & 29, and you can head out at your own leisure. Enter your name in a drawing for prizes (need not be present to win). Every participating child will receive a prize!

**"34th Annual AWC Creek Cleanup"
Thursday, May 10 through Monday, May 14**

Now is the time to plan and sign up for this year's Creek Cleanup. Our long-standing tradition to get winter's trash out of our lakes and creeks will run for 5 days again this year. Individuals, families and teams are urged to sign up soon. First, check the list of available locations. Next, sign up here so we know when and where you will be cleaning and how much you will need for supplies. Bags, gloves, first aid kits, hand wipes, directions, maps, etc. will be

ready for pick up a week prior to May 10. Check our [website](#) for current information.



THANK YOU!

AWC is especially grateful for its members, volunteers, and the many sponsors who provide support for Creek Cleanup and other events as well as our grants and contract partners. All this great work would not happen without you.

A FEW THINGS YOU CAN DO TO HELP AWC

Many of you have linked your **Fred Meyer** rewards card to Anchorage Waterways Council and it means that we receive quarterly donations from your shopping. If you haven't linked to AWC, we would love to have you. These donations help us fund our programs. Our Fred Meyer number is 88984. This is a win-win situation for everyone. To renew or sign up, go to [Fred Meyer Rewards](#) and follow the directions. On that page you can click on their link to sign up. Thank you to all who have in the past, who renew, and who will sign up for the first time.

Amazon Smile also donates a portion of Amazon purchases to various charities. [This link](#) will give you information on what they do and how to sign up.

Finally, our largest single annual donation comes from [Pick, Click, Give](#). People choosing to donate a part of their Permanent Fund dividend can help a variety of non-profits out. **Anchorage Waterways Council** has been a

recipient for the past 4 years, and we are very appreciative of Alaskans' generosity.



How can you help AWC maintain healthier creeks?

Volunteer

There are many ways to help AWC as a volunteer. We have fantastic volunteers who donate hundreds of hours annually to monitor our creeks each month, hundreds of participants take to the creeks every May to pull tons of trash out during our Annual Creek Cleanup, and many of you are "eyes on the creek"--reporting things that are disturbing--and we do our best to respond or help people find the right place to "complain". Consider becoming an AWC board member! AWC is a 501 (c) 3 non-profit and memberships and donations (monetary or items) are tax deductible.

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It's easy, you can go online at www.anchoragecreeks.org and click the "**JOIN NOW**" button, to join, renew or donate, or click the "**Join or Renew Now**" button at the top of this email. We are now set up to do recurring payments as well! This can be as simple as \$5 or \$10 a month, but it adds up BIG for us. If you have a question about your membership and when it expires, please contact us at awc@anchoragecreeks.org. If you know someone who wants to help support our great waterways, please forward this email to them, or if you want to provide a gift membership--contact us. Does your employer have a volunteer match program? Thanks to all for your continuing support and especially to our sponsors and volunteers who watch the waterways, monitor the creeks, and help this great organization--the ONLY one in Anchorage dedicated to protecting our creeks, wetlands, and watersheds.

Reminder: Like and Follow us on **Facebook** at "Anchorage Waterways Council" and "Scoop the Poop Anchorage" .

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AWC UPDATE - June 25, 2018:

A message from the Executive Director, Cherie Northon

In May, AWC held its 34th Annual Creek Cleanup with over 40 teams participating. A huge thank you to all volunteers this year and to our sponsors whose support allows this great event to happen. We could not do this without you. If you haven't signed up a group before, please [email](#) us and we will notify you when sign-ups open for specific [creek locations](#).

Thank You for Helping Make our 34th Annual Creek Cleanup a Huge Success!

Without the generous support of our sponsors, we could not organize such an important event.

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CREEK GUARDIAN (\$500-\$999)

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CREEK WATCHER (Up to \$499)

Moose's Tooth ♦ ALPAR



Special assistance by MOA Parks and Recreation & MOA Solid Waste Services

And to all our fantastic volunteers in the creeks!

THANK YOU!



Anchoragecreeks.org

Plastics vs. Waterways, Part 2

Just when you thought you'd heard enough bad news about plastic pollution in aquatic environments, there is more. Research is bringing to light problems with "microfibers".

What the heck are microfibers and where are they found?

Pretty much invisible to the human eye, microfibers have recently been discovered in fresh and marine ecosystems, and some of the products that we consume, such as fish, shellfish, and sea salt.



Microfibers photographed in an oyster from Apalachicola Bay, FL, 2015. Photo courtesy of Robert Simmons, Ph.D. (microscopy@briarwillow.com)

Microfibers are a very fine synthetic yarn whose strands have a diameter of less than one denier (or ten micrometers), which is approximately 1/5 the diameter of a human hair. They are used to make certain products, including much of our favorite active wear—running shorts, yoga pants, and fleece jackets. The primary textiles that shed microfibers are nylon, polyester, rayon, acrylic, and spandex, which are very popular because of being lightweight, resistant to wrinkling and pilling, breathable, comfortable, and having better thermal insulation.

Although microfibers have been around since the late 1950s, their use in clothing, furniture fabric, and in household items did not really take off until the 1990s. Polyester, spandex, and polar fleece are especially popular, and we have become greatly dependent on them. I love my 20 year old bright yellow Eddie Bauer EBTEK pullover fleece which has racked up tens of thousands of world travel miles with me (when I fly, it goes), yet, sadly, fleece is one of the worst offenders for releasing microfibers. And, it's been found that the older the garment-the more likely it is to shed microfibers.



Cherie Northon in the Falkland Islands with Gentoo penguins attracted to her favorite yellow fleece, 2007. Photo courtesy of Thom Eley, Ph.D.

How does my fleece pullover impact marine and freshwater habitats? Whenever items containing microfibers go through the washing machine, they release thousands of microscopic plastic fibers, known as microfibers. From the laundry they travel into septic systems or wastewater treatment plants. Though it is estimated that wastewater treatment plants can capture 62-92% of the microfibers, an enormous number are finding their way into fresh and saltwater ecosystems in the discharged effluent and on land from wastewater sludge that is often used as a fertilizer.

Aside from abandoning some of our favorite clothes and items, what can we do?

Two global fixes to the microfiber problem that have been proposed are major and very costly. One is to upgrade wastewater treatment plants to trap and better retain microfibers, and the other is for a change in the textile and clothing industry to move away from microfiber fabrics. If instituted, these changes will take time, money, an attitude shift, and a huge buy-in by producers and consumers. In the meantime, there are some things each of us can do.

- Wash synthetic clothes less frequently and for a shorter cycle.
- Fill up your washing machine. Washing a full load results in less friction between the clothes and fewer fibers are released.
- If you use powdered detergent, consider switching to a liquid laundry soap. Laundry powder causes more scrubbing, which loosens more microfibers.
- Use a colder wash setting. Higher temperatures can damage clothes and release more fibers.
- Spin dry clothes at low revolutions. Higher revolutions increase the friction between the clothes.
- When you clean out your washer and dryer filters, place lint in the trash instead of washing it down the drain (which would defeat the whole purpose).
- If you are in the market for a new washer, consider a front loading model. Studies have shown that front loading washers cause significantly less microfiber shedding than top loading washers.
- You can purchase a special microfiber filter for your washer. Although they require more of an investment, there are several models on the Internet with prices around \$150, and they are also helpful for reducing septic system/drainfield failures and clogged drains.
- Consider buying a Guppy Friend wash bag. During testing, the bag captured 99 percent of fibers released in the washing process. The bags are available for purchase at Patagonia for around \$30. They measure about 20" x 30" and are perfect for a few items. Beth Terry, a plastic pollution activist, reviewed the Guppy Friend bag and recovered a small amount of fiber lint left in the bag after a washing cycle. Remember, these are microfibers, so don't expect a huge ball of fuzz.



A new Guppy Friend bag. (guppyfriend.com/en/)



Guppy Friend bag after washing fleece. Photo courtesy of Beth Terry (myplasticfreelife.com)



Microfibers collected in the Guppy Friend bag. Photo courtesy of Beth Terry (myplasticfreelife.com)

- What about larger item such as sheets, blankets, or pet beds? There is another product on the market which might fill that gap-the Cora Ball whose design is based on how coral filters water. All you need to do is toss one into your washing machine with a load of clothes. According to their inventors, "Cora swooshes around in the laundry and just like coral, allows water to flow, while picking up those little pieces of microfiber and catching them in her stalks". And, of course, remove the Cora after washing and clean it when there's an accumulation of lint (not necessarily after every wash). Again, remember to put the lint in the trash, not down the drain.



Tossing the Cora Ball into the washer. Photo courtesy of Cora Ball (Coraball.com)

- Think more carefully about what you own (and wash) that is made of synthetics. As an example, fleece typically brings to mind jackets or pullovers. Around my house I found socks, slippers, caps, vests, pants, blankets, throws, and pet beds. Microfiber bed sheets now fill store shelves, and are getting rave reviews including recent publicity from NBC's "Today" show. Who wouldn't be swayed by the fact that they are soft, cool, wrinkle-free, and run about \$30 a set? Too bad the review didn't mention the downside of microfiber products.
- Consider switching to products that are made from natural fibers, such as cotton, linen (flax), and wool. There is a different set of environmental concerns, which means tradeoffs. Both linen and cotton (especially) require large inputs of water and chemicals (fertilizers and pesticides), although linen tends to be less demanding. And, of course, while sheep's wool is a renewable resource, there are environmental downsides to raising large animal herds. Hemp and bamboo, also made into bed sheets, are gaining more recognition and acceptance, which would be good, natural alternatives. However, currently they cannot compete with the low cost of microfiber sheets.

To an improved future...

Today's relationship with plastic is complex; some aspects have fairly simple remedies while others are not easily resolved. The products we purchase, the lifestyles we lead, and the regard we have for minimizing the very negative environmental effects of plastics are all important. Certainly there is much room for improvement to try and minimize many of the consequences. We can only do better by being informed about human-made environmental disasters, such as plastic pollution in freshwater and the oceans, and by taking steps to help mitigate our personal impact.

Upcoming Events

July 21, 2018 - "Park Place" - Taku Lake Park - Noon to 3 pm
[Anchorage Museum's "Park Place"](#) is a monthly summer park program exploring Anchorage's history, people and community through neighborhood parks. AWC will be at this event with macroinvertebrates and a display on plastic pollution. Please stop by and visit us. While there, guess the length of monofilament in this bag - you could win a \$25. Moose's Tooth Gift Card.



July 28, 2018 - "Dog Jog" - Service High School - 9 am to 1 pm

Friends of Pets' annual canine carnival helps pets in need! AWC will be there with Scoop the Poop information and goodies. Be sure to [sign up](#) and come on out to support a great cause.

HOW YOU CAN HELP AWC MAINTAIN HEALTHY CREEKS

[Link](#) your **Fred Meyer** rewards card to Anchorage Waterways Council (88984).

Use **Amazon Smile** when you make purchases. charities. This [link](#) will take you right there!

Volunteer

There are many ways to help AWC as a volunteer. We have fantastic volunteers who donate hundreds of hours annually to monitor our creeks each month, hundreds of participants take to the creeks every May to pull tons of trash out during our Annual Creek Cleanup, and many of you are "eyes on the creek"--reporting things that are disturbing--and we do our best to respond or help people find the right place to "complain". Consider becoming an AWC board member! AWC is a 501 (c) 3 non-profit and memberships and donations (monetary or items) are tax deductible.

AWC Membership--Renew or Join!

Being a member of AWC means that you care passionately about the well-being of your own environment. We work to keep the waterways clean, clear, and of value to all. From clean water and recreation to creating a general feeling of well-being, our waterways need protecting for our own benefit, as well as for the countless other species that rely on them. Adding your name to our membership means we can make a stronger stand when it comes to the issues that can affect us all--use your vote and become a member today!

It's easy, you can go online at anchoragecreeks.org and click the "**JOIN NOW**" button, to join, renew or donate, or click the "**Join or Renew Now**" button at the top of this email. We are now set up to do recurring payments as well! This can be as simple as \$5 or \$10 a month, but it adds up BIG for us.

If you have a question about your membership and when it expires, please contact us at awc@anchoragecreeks.org. If you know someone who wants to help support our great waterways, please forward this email to them, or if you want to provide a gift membership--contact us. Does your employer have a volunteer match program? Thanks to all for your continuing support and especially to our sponsors and volunteers who watch the waterways, monitor the creeks, and help this great organization--the ONLY one in Anchorage dedicated to protecting our creeks, wetlands, and watersheds.

Reminder: Like AND Follow us on **Facebook** at "[Anchorage Waterways Council](#)" and "[Scoop the Poop Anchorage](#)".

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NEWS

'Don't feed the ducks' is working: Water quality at Cuddy Pond has drastically improved

Friday, October 19th 2018, 6:36 PM AKDT

Updated: Friday, October 19th 2018, 8:51 PM AKDT

By: **Lauren Maxwell**



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It was one of the most polluted waterways in Anchorage, but today the pond at Cuddy Park has turned around.

Cherie Northon with the Anchorage Waterways Council credits a number of factors for that success, but said the biggest one is that people have learned to stop feeding the ducks.

In July 2014, Thom Eley, also with the Waterways Council, measured fecal coliform levels at the pond at 18,000 colonies per 100 milliliters of water. Eley described those numbers as "unheard of."

The problem? Ducks and geese were congregating at the park in huge numbers and leaving their droppings behind.

The birds had no reason to move on since people were constantly feeding them.

"We considered it a human-caused problem because of the additional food that was being offered," said Jeanne Swartz with the Department of Environmental Conservation. "And the fact that (the birds) have no natural predators, there was no reason for the ducks or geese to ever leave."

In 2016, people with an interest in the park got together to address the problem and came up with a variety of solutions that included a grant from the Environmental Protection Agency to fund them. The money went to the Waterways Council for signs, outreach and education. Other funding went to Anchorage Parks and Recreation Department to put up fencing and plant vegetation native to Alaska around the water's edge to separate people and water fowl. Both measures made a big difference.

Eley with the Waterways Council said in 2017, a year after the signs and fencing were put in place, the fecal coliform levels had dropped dramatically.

And they continued to drop.

By September 2018, the levels were down to just 22 colonies per 100 milliliters of water.

2015



2015

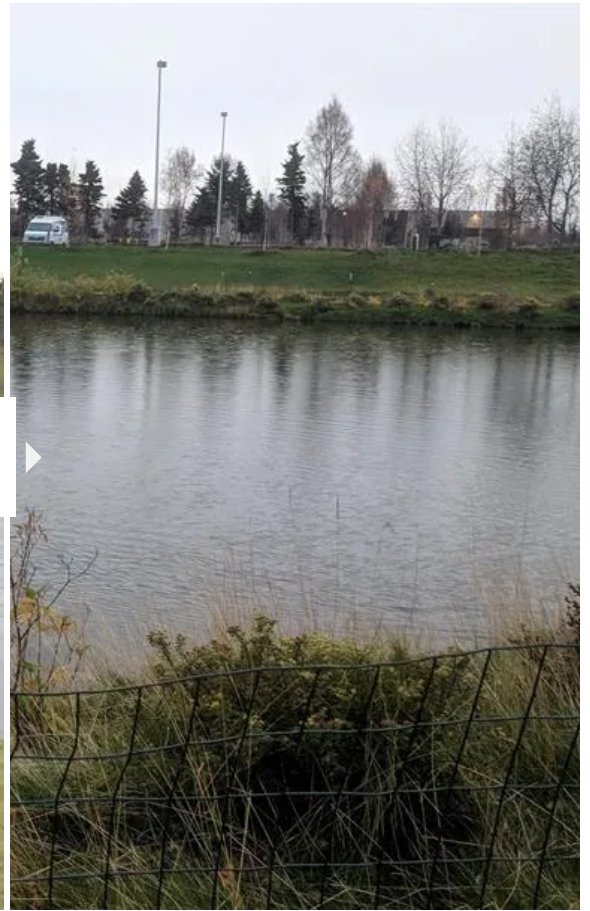


Photo Credits: Before KTVA file photo **After** John Thain/KTVA

Jeanne Swartz, with the DEC calls that an incredible success story. She said geese and ducks still visit the pond, but they don't tend to stay or nest there as they have in the past. She said there are other benefits, too.

"People are much happier when they are dog-walking or visiting the park because they don't have to be concerned with so much goose poop," said Swartz. "And we just have a healthier environment. Healthier for us, healthier for the birds, even healthier for the dogs."

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Fecal matter contaminates city streams, can make you sick



By Rebecca Palsha | Posted: Tue 3:44 PM, Apr 24, 2018

ANCHORAGE (KTUU) - Some people call it a "dirty secret," and the situation is pretty dirty: There is tons and tons of poop all around Anchorage.

Human poop, dog poop, that doesn't even get into wild animals.

It's pretty gross, but even worse, it can make you sick.

"All poop, they carry germs, bacteria, parasite, virus so being in contact with dog poop, as with any poop, can cause you to be sick," Willy Mamtchueng, the disease prevention and control supervisor for the Muni Department of Health & Human Services said. "And when I say sick, I'm talking about having diarrhea, stomach, cramps, fever, chills, sweat. Really not feeling well and throwing up as well."

The city estimates there are 65,000 dogs in town. Those dogs produce an average of more than 48,000 pounds of poop every day.

Clearly, most people aren't touching the poop, but it can still make someone sick. The city says the germs from the fecal matter is one of the largest causes of water pollution in the streams and creeks in Anchorage. Additionally, one way to get sick is when someone takes off a shoe that has walked over poop and then doesn't wash their hands.

"They don't wash their hands properly, and don't wash their hands at all, and eat or put their hand in their mouth some way," Mamtchueng said, "and that's how they get the bacteria into the system."

The official Scoop the Poop day is April 28.

Cuddy Park Monitoring Study

By

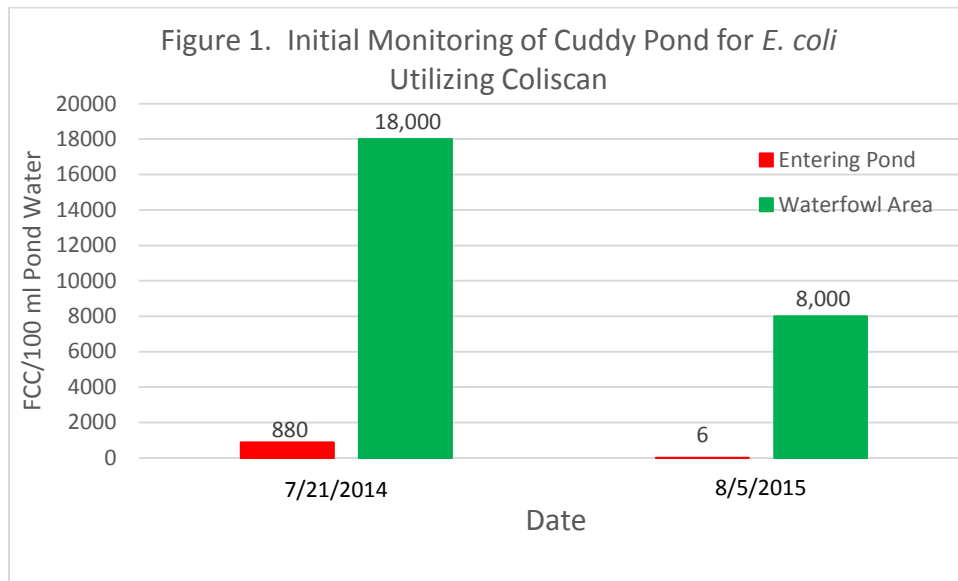
Thom Eley, Ph.D.

Anchorage Waterways Council

December 2018



On July 21, 2014, Dr. Thom Eley and Robert Veeh of Anchorage Waterways Council (AWC) did a fecal coliform monitoring survey of the length of Fish Creek from east of Lake Otis to the mouth. When planning to evaluate Cuddy Pond by monitoring, it was decided that the in-flow from the culvert containing Fish Creek would be a good starting point. Secondly, since a large population of waterfowl and other waterbirds, primarily gulls, were present, it was obvious that the bird area should be sampled. The tests used Coliscan®. The findings are presented in Figure 1.



For the 2014 sampling, the results from fecal coliform colonies/100 ml of pond water were startling as the number of colonies in both the incoming water and the pond area were very high. It must be remembered that these samples were taken during the height of people feeding the birds.

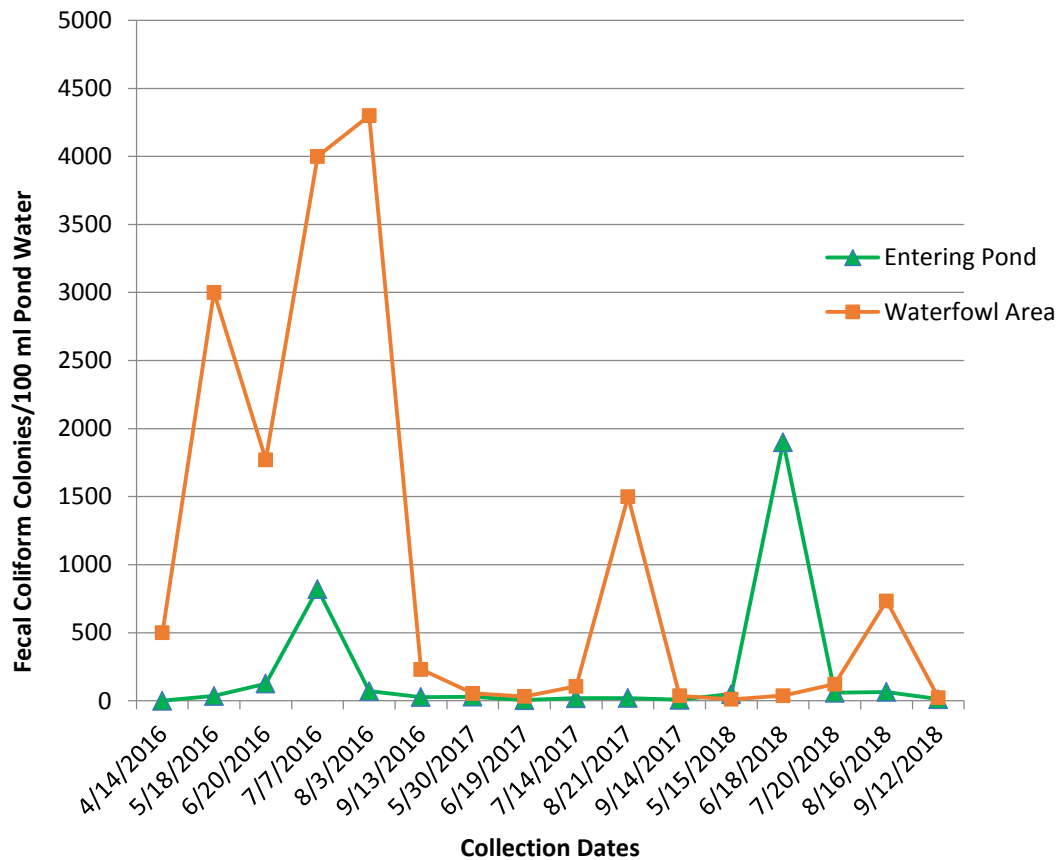
We did not have money for a regular sampling program, which the above findings suggest was needed. We resampled Cuddy Pond again in 2015, while the results were somewhat less, although they again showed an excessive number of colonies in the waterfowl area. The lower numbers from the in-flow were due, in part, to the lack of rain for several weeks before the sampling.

It was decided that a grant should be pursued to carry out more detailed studies of Cuddy Pond. SGS Environmental Services was approached to see what the cost would be for analyzing samples from Cuddy Pond. Incredibly, SGS volunteered to sponsor AWC’s monthly sampling of the pond. We are most grateful for their continued support. Thus, the monthly sampling during the summer months began, and we have just finished our third year. The findings from our three sample years are presented in Table 1 and Figure 2.

**Table 1. *E. coli* colonies/100 ml of water,
2014 to 2018.**

Date	Entering Pond	Waterfowl Area
7/21/2014	880	18,000
08/05/2015	6	8000
4/14/2016	0	500
5/18/2016	35	3,000
6/20/2016	126	1,770
7/7/2016	820	4,000
8/3/2016	70	4,300
9/13/2016	27	230
5/30/2017	29	54
6/19/2017	5	31
7/14/2017	19	106
8/21/2017	20	1,500
9/14/2017	7	36
5/15/2018	49	10
6/18/2018	1900	37
7/20/2018	58	122
8/16/2018	64	733
9/12/2018	12	22

Figure 2. *E. coli* Counts, Cuddy Pond, 2016-2018

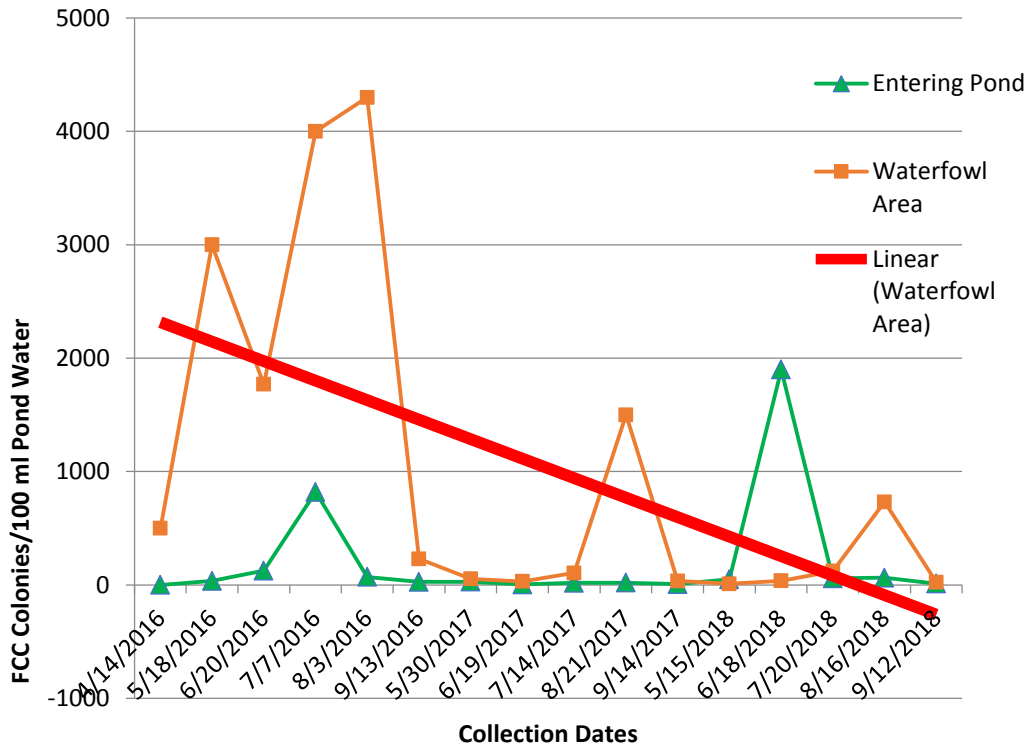


The first peak in colonies during 2016 correlates to the arrival of waterfowl followed by a decline when the waterfowl were off nesting, and the second peak was when the waterfowl returned with their young. There were gulls in the area all summer, however, Wildlife Service agents from the Department of Agriculture did conduct a program to reduce the number of nesting gulls adjacent to Cuddy Pond.

In 2016 and 2017, AWC and a group of stakeholders conducted a concerted program to reduce the feeding of waterfowl and other waterbirds by park visitors. The upshot has been that fewer waterfowl are hanging out or nesting at Cuddy Pond. The peaks of fecal coliform colonies in the incoming water are associated with major rain events.


Figure 3 shows the overall trend (red line) in the numbers of fecal coliform colonies per 100 ml of pond water, and we are pleased to see that the line shows a linear decline. We hope that this trend will continue.

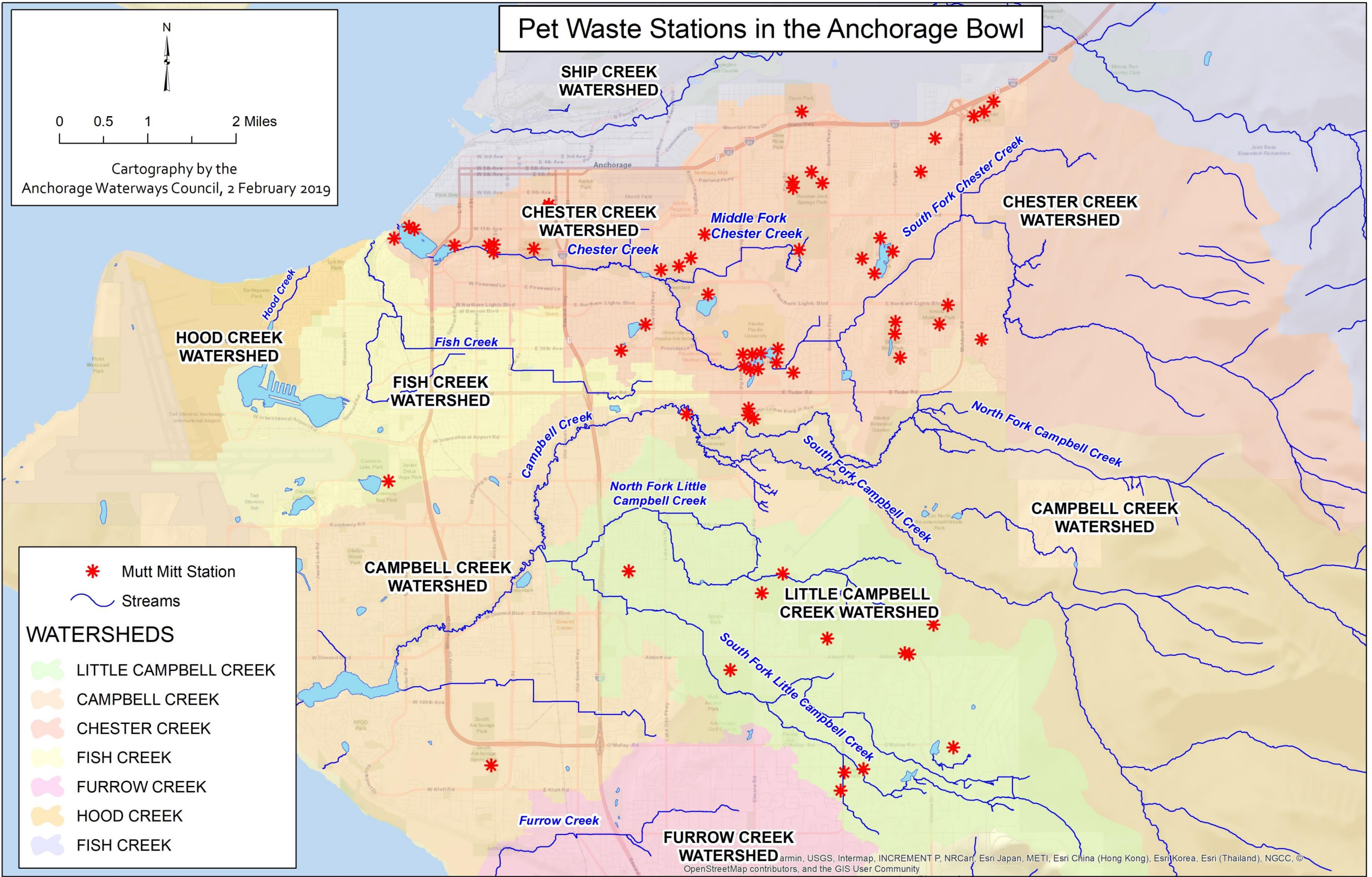
Figure 3. *E. coli* Counts, Cuddy Pond, 2016-2018





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
Pet Waste Stations in the Anchorage Bowl


 0 0.5 1 2 Miles
 Cartography by the Anchorage Waterways Council, 2 February 2019



 Mutt Mitt Station
 Streams

WATERSHEDS

-  LITTLE CAMPBELL CREEK
-  CAMPBELL CREEK
-  CHESTER CREEK
-  FISH CREEK
-  FURROW CREEK
-  HOOD CREEK
-  FISH CREEK

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2018 APDES Annual Meeting Presentations

Chester Creek Watershed Plan (2015) Implementation Progress

In 2015, the Chester Creek Watershed Plan was approved by the Municipal Assembly. It consists of 87 "Restoration Priorities (Action Items)" for the 2,700 acre watershed of which roughly half of the area is urbanized.

The type of action items vary from conducting educational campaigns to discourage residents from tossing plants and yard waste into the creek to realigning Chester Creek and replacing undersized and damaged culverts to improve fish passage at Muldoon and DeBarr. The latter was accomplished between 2009, when the design contract was let, and 2017 with the landscaping closeout in 2017.

Major participants in this project were: HDR, CRW, KPB, and Land Design North, with construction by Bristol.

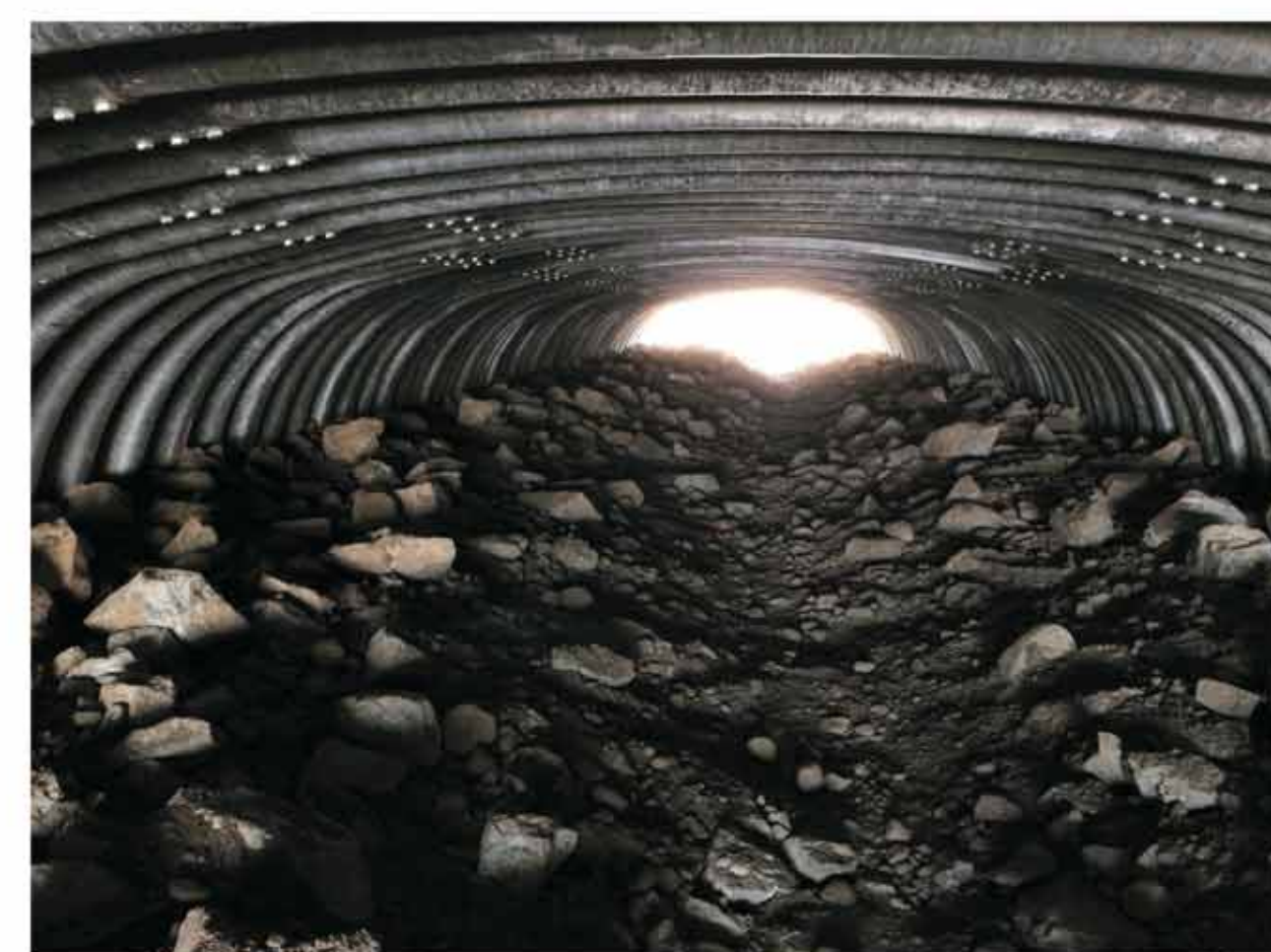
Prepared by Anchorage Waterways Council, 2018



Original double culverts on S. Fork Chester Creek (east of Muldoon). Trash was typically found there which further compromised fish passage. (C. Northon, 2009)



Newly aligned channel just east of Muldoon with meanders and woody debris that were placed to improve stream substrate. (HDR, 2015)



Inside the new box culvert showing an improved, cobbly substrate. (HDR, 2015)



Two years after completion, the vegetation around the culvert (looking west towards Muldoon) is well established. (C. Northon, 2017)



Original channel of S. Fork Chester Creek looking upstream (east) from Muldoon. (C. Northon, 2009)



Original channel looking upstream (east) after water had been diverted to new channel in July 2015. (C. Northon, 2015)



Original channel with emergent vegetation (looking east) two years after Chester Creek was diverted to new channel (C. Northon, 2017)



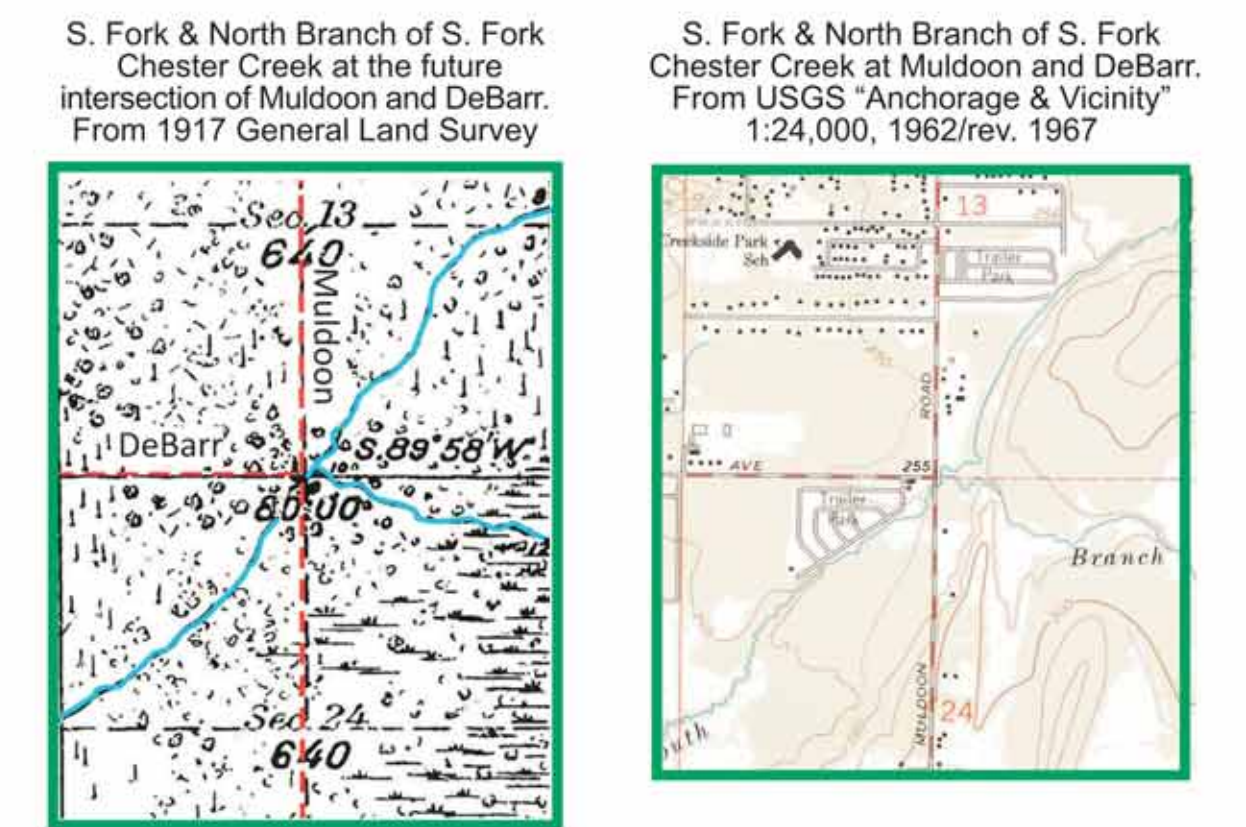
Future location of new channel east of Muldoon, which is the former property of Mann Leiser's Alaska Greenhouses. Looking east (Google Earth, 2011)



Chester Creek in new channel near Muldoon, sculpted from the former property of Alaska Greenhouses. Looking east (C. Northon, 2015)



Vegetation well established in the newly realigned channel. Looking east (C. Northon, 2017)



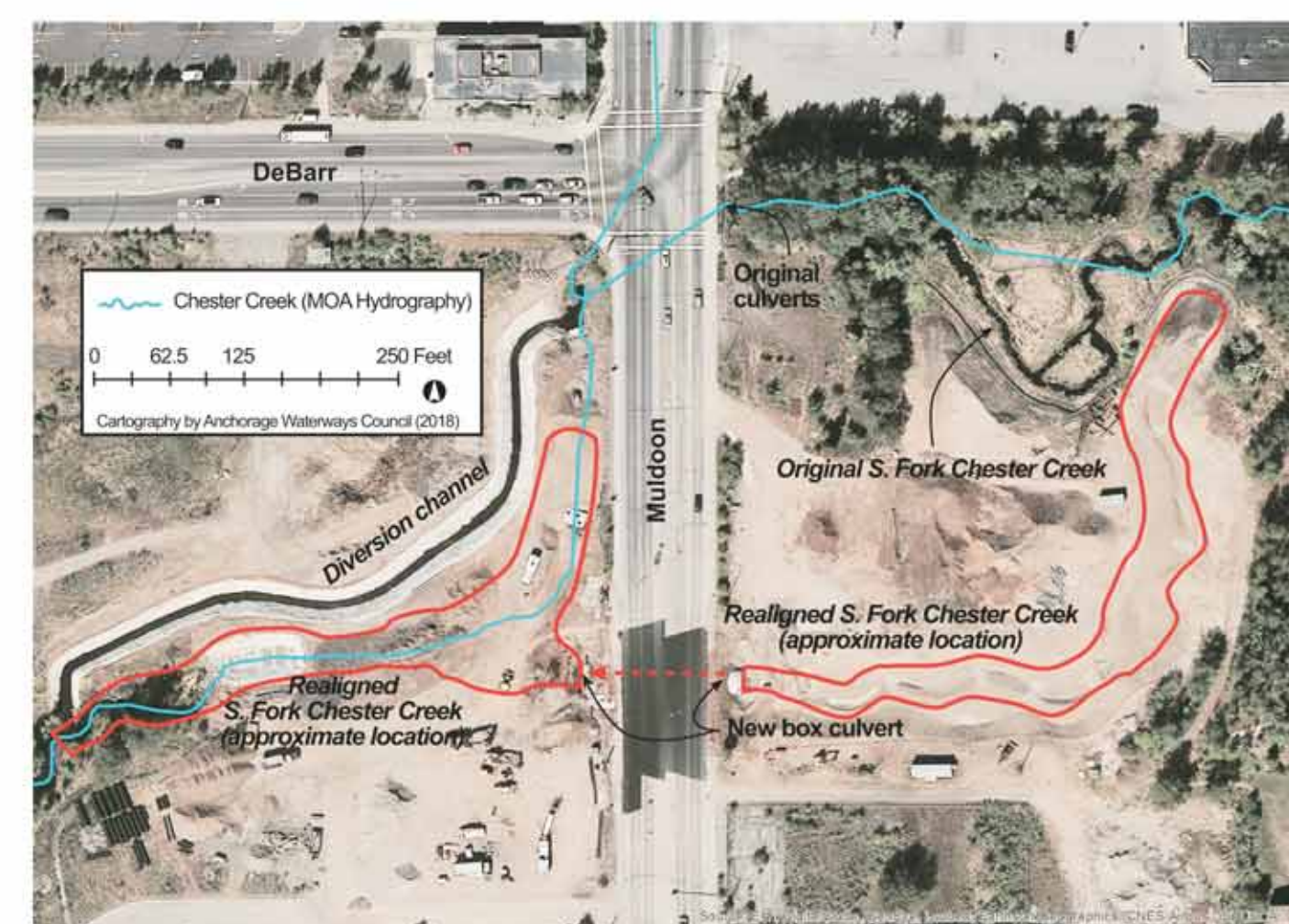
Mann Leiser's Alaska Greenhouses on S. Fork of Chester Creek. (Google Earth, 1996)



The Alaska Greenhouses, closed in the 1990s, had been partially demolished which revealed Chester Creek. (Google Earth, 2003)



Approximate location of the former Alaska Greenhouses (red outline). The base image is from ArcGIS. (USGS Topos, 2015)



Location of future channel of S. Fork Chester Creek near Muldoon. The base image is from ArcGIS. (USGS Topos, 2015)

MOA Watershed Plans Update: Chester and Little Campbell Creeks

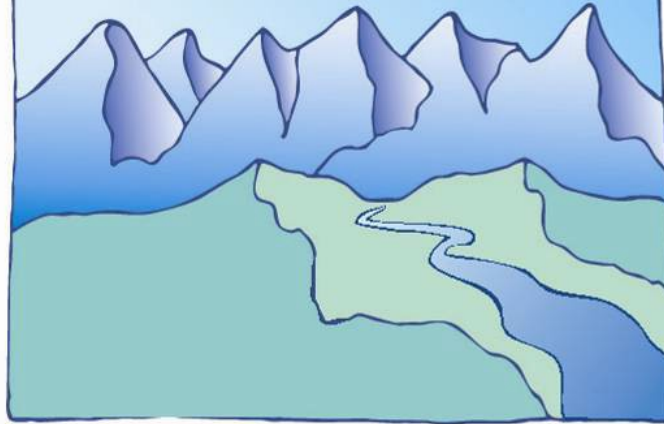
Cherie Northon, Ph.D.
Executive Director
Anchorage Waterways Council
March 8, 2018



APDES Permit and Watershed Plans

- APDES Permit Years 2010 – 2015
 - Permittees must complete at least two individual watershed plans for specific water bodies before the expiration date of the permit
 - Little Campbell Creek Watershed Management Plan - completed
 - Chester Creek Watershed Plan - completed
- APDES Permit Years 2015 – 2020
 - Campbell Creek Watershed Plan – being scoped

**little campbell
creek**



**W A T E R S H E D
M A N A G E M E N T
P L A N**

Little Campbell Creek Watershed Management Plan

- It is 55 pages with 11 maps and 3 tables.
 - Introduction
 - Why the plan was created and who was involved
 - Watershed characterization
 - Physical aspects
 - Human modifications
 - Watershed issues
 - Water quality
 - Water quantity
 - Terrestrial and aquatic habitat
 - Recreational and economic opportunities
 - Communication, coordination, and data acquisition
 - Plan implementation
 - Action items
 - Responsibilities
 - Projected costs
 - Timetable

Aquatic Habitat

Goal: Improve fish passage, channel habitat maintain flows to support fish and creek function in the watershed.

Strategy: Provide unimpeded fish passage, restore straightened channels, protect and increase wetland habitat.

Priority	Implementation Strategy	Action Items	Anticipated Start/End	Cost Estimate	Evaluation Methods /Milestones
1	3.1. Upgrade culverts identified in ADF&G culvert survey that impede fish passage.	<ul style="list-style-type: none"> Design and construct top 10 prioritized culverts – first eight are (AF&G ID): <ul style="list-style-type: none"> #103- North Fork (Abbott Road) #105-South Fork (Atkins/near 85th) #150- North Fork (Lake Otis Pkwy/72nd) The other culverts identified are: #99, 107, 126, 125, 124 Ensure fish passage through Alaska Zoo Ensure fish passage along new Elmore Road New Seward Highway culverts – work with DOT to produce best design possible -has highest long-term impact for fish passage. 	<i>Start:</i> February 2008 <i>(Road upgrade schedule applies)</i>	\$1.5 million first 5 culverts in SSSP grant. DOT cost unknown for #103 or New Seward Highway replacements. All other culverts on municipal streets.	<i>Evaluation Methods:</i> - Culverts replaced - Miles restored <i>Milestones:</i> - Top 3 culverts 2009 - Top 10 culverts 2012
2	3.2a. Restore modified channels for habitat improvements.	<ul style="list-style-type: none"> Assess, design and construct the top creek restoration projects – first five are: <ul style="list-style-type: none"> 1st : Replace 360 foot long culvert at DNS concrete with open channel. 2nd: Parcel-72nd South of Parcel 3rd: Parcel-Galatea Estates 4rd: Turinski Parcel east of Lake Otis Parkway 5th: Channel South of 88th. Ave. 	<i>Start:</i> June 2008		<i>Evaluation:</i> - Linear feet restored <i>Milestones:</i> - First restoration in 2008 - Top three 2011
3	3.3a. Construct, restore, and preserve wetlands and open water habitats.	<ul style="list-style-type: none"> Acquisitions and protections related to 2.1. Support AF&G in-stream flow gauging and apply for instream flows. 	2007 and ongoing	\$40k for gauging	In-stream flow reservation by 2010

Note: Culvert designations are found at http://www.sf.adfg.state.ak.us/SARR/Fishpassage/FP_mapping.cfm



CHESTER CREEK
WATERSHED PLAN
2014

Chester Creek Watershed Plan

- It is 83 pages and has 32 figures/maps and 3 tables.
- Modeled after the Little Campbell Creek Watershed Management Plan
- It was produced by the Anchorage Waterways Council
- Approved by the Municipal Assembly on May 14, 2014

Map ID	Goal(s)	Lat/Long	Approximate Location	Issue	Action Item	Lead	Cost	Priority	Mandate
CSF-19	4	61.2, -149.73	South Fork at Muldoon Road	ADF&G 20400249 fish passage issue. Gradient in culvert makes perch and velocity barrier, long-term maintenance issue for hydraulics, does not pass 100-year flood well, backwaters upstream businesses.	Replace culvert, evaluate current (2012) design to move creek to new location and crossing under Muldoon road. Underway	MOA, AKDOT	6	1	ADF&G
CSF-20	3,4	N/A	South Fork upstream of Muldoon Road	Creek is modified with low habitat diversity and at-risk of road and development.	Create more natural creek on South Fork east of Muldoon Road. Align to Hill with a 100 foot corridor.	DPW		2	ADF &G
CSF-21	1	N/A	South Fork upstream of Muldoon Road	Creek has significant debris in it up to halfway to military land	Take debris out of creek.	AWC	1	1	APDES
CSF-22	4	N/A	North Fork of the South Fork Muldoon Road	Creek is culverted under Muldoon Road for 1,500 feet	Remove North Branch of South Fork from Muldoon Road and put into open channel in a 100 foot ROW.	DPW	2	2	ADF&G
CSF-23	6	N/A	North Fork of the South Fork Rangeview Trailer Court	Encroachment and debris issues in the creek, dog use, trampling of banks.	Remove debris, install access points, revegetate other access points.	Private	1	3	APDES
CSF-24	6	N/A	South Fork at lakes and bogs	No education signage for public.	Install kiosks at University Lake, Baxter Bog, Cheney Lake.	AWC	1	3	APDES
CSF-25	4	61.19, -149.82	Mallard Drive	ADF&G Culvert 20400250 fish passage issue as a constriction to creek	Replace with a larger, embedded culvert.	MOA	3	2	ADF&G

Watershed Plan Updates

- Annual progress of watershed plans needs to be tracked as part of the second 5 year APDES Permit (2015-2020)
- Each of the “action items” is reviewed to ascertain what, if anything, has happened, i.e. culverts were replaced (or not)
- The action plan is updated and is part of the yearly report that AWC provides to the WMS

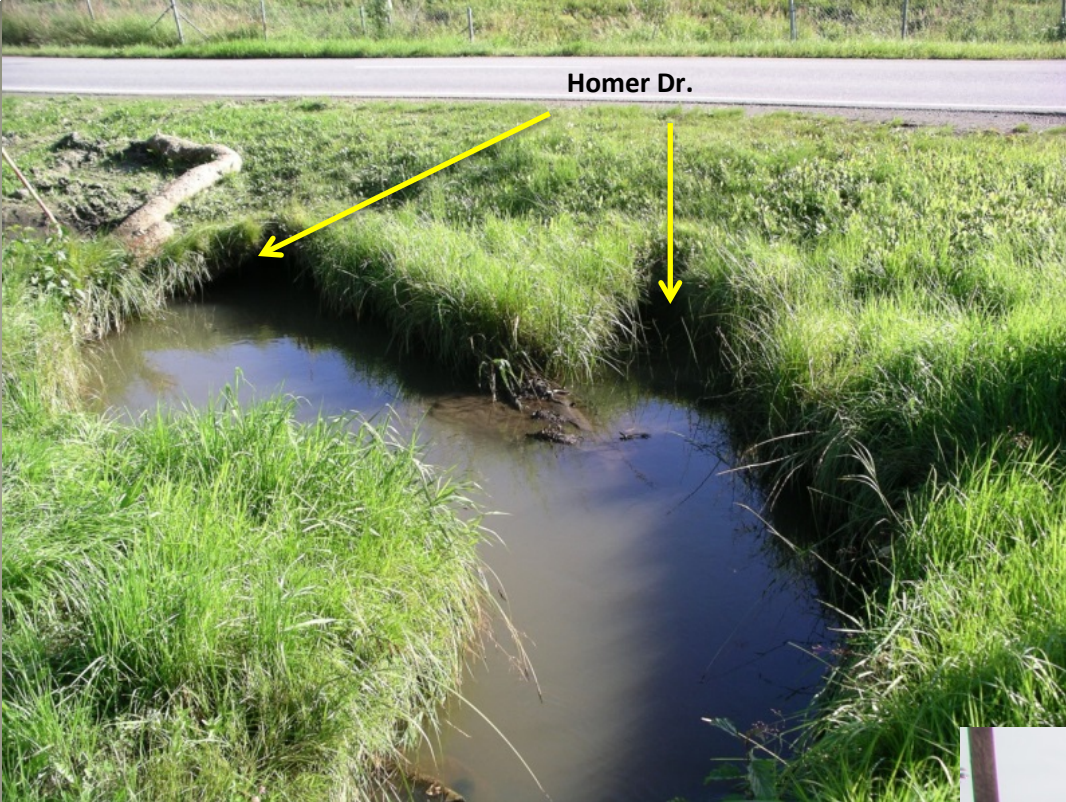
Significant Milestones in the Watershed Plans

MAJOR CULVERTS REPLACED!

- North and South Forks of Little Campbell Creek
 - New box culverts under the New Seward!
- S. Fork Chester Creek
 - New box culvert under Muldoon and the creek realigned!

North Fork Little Campbell Creek at Homer and 70th









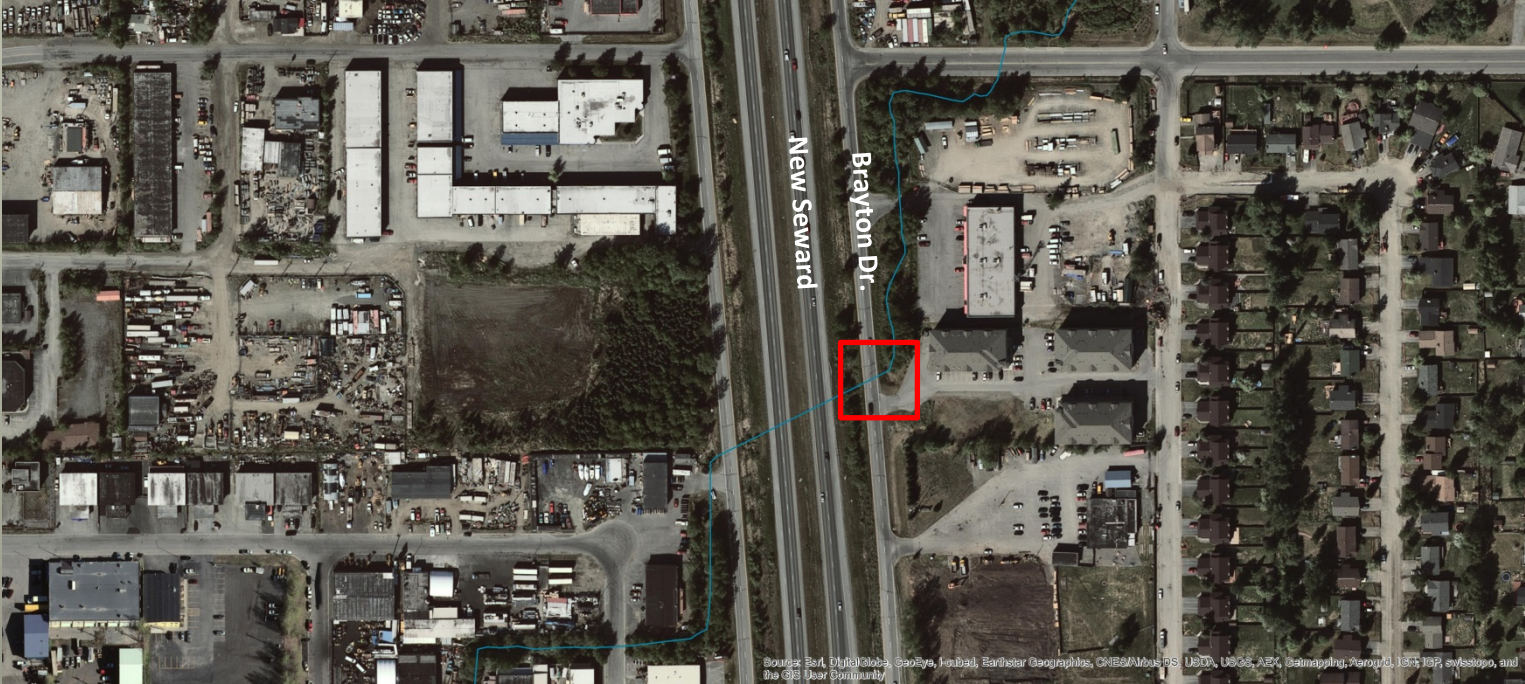
Homer Dr.



Homer Dr.

08/20/2017 10:42

North Fork Little Campbell Creek at Brayton and 68th



N. Fork Little Campbell Creek

East side of the New Seward near Kaladi's at 68th



10/01/2017 13:46

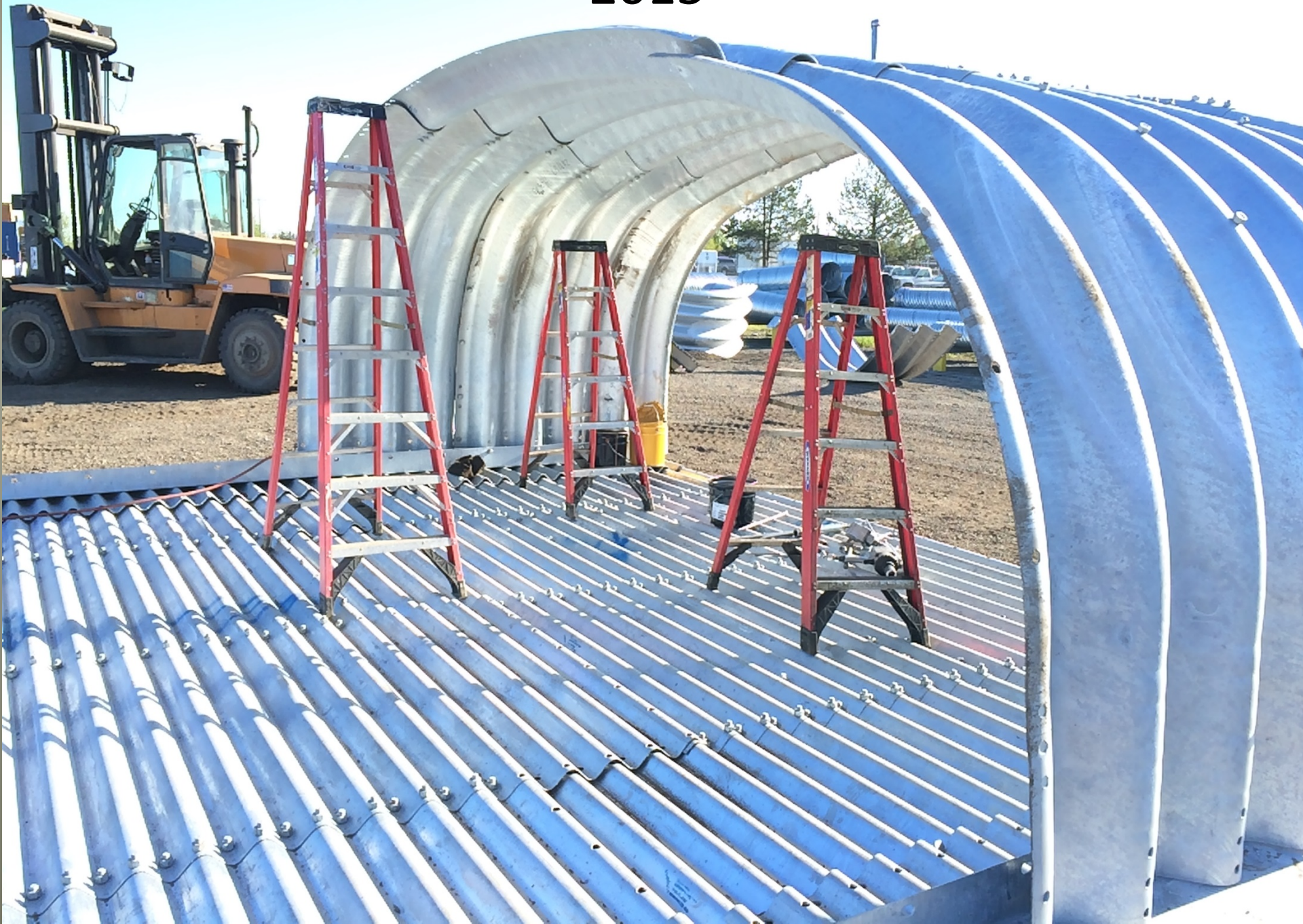
S. Fork Chester Creek at Muldoon and DeBarr - 2009



2009



2015



2015



2017

08/27/2017 10:44



Original S. Fork Chester Creek - 2009



Realigned S. Fork Chester Creek - 2015



Realigned S. Fork Chester Creek - 2017



08/27/2017 10:46


Muldoon and DeBarr - 2003



2015

DeBarr

Muldoon

 Chester Creek (MOA Hydrography)

0 62.5 125 250 Feet

Cartography by Anchorage Waterways Council (2018)

Original culverts

Original S. Fork Chester Creek

Realigned S. Fork Chester Creek (approximate location)

Realigned S. Fork Chester Creek (approximate location)

New box culvert

Diversion channel

What is the value of watershed planning?

- Changes take time to happen.
- Watershed “Roundtable” meetings:
 - Bring together a variety of stakeholders
 - Communication of potential projects that various agencies and organizations have in their sight
 - Collaboration reduces costs and produces greater impacts

Comments?

Little Campbell Creek Watershed Management
Plan

Chester Creek Watershed Plan

are on the WMS site:

anchoragewatershed.com/watershedplanning.html