



LIVING ALONGSIDE SALMON HOMES



**How to Be a
Salmon-Friendly Landowner**



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PROTECTING CLEAN WATER
& SALMON HABITAT
IN INTERIOR ALASKA



Thousands of salmon streams flow throughout Interior Alaska. Salmon are part of our regional identity and way of life. If you are reading this booklet, there is a good chance you live near a salmon stream. More specifically, you most likely live near a stream which serves as a nursery for baby salmon.

Residents of Interior Alaska play a critical role in maintaining our state's salmon populations by protecting local water quality and stream habitats. Being a salmon-smart neighbor means making good choices for our streams, rivers, wetlands, and lakes. Good choices also ensure our communities have access to clean drinking water, recreation opportunities, and thriving habitats and ecosystems for future generations.

This guide offers information, tips, and resources for community members to help salmon populations and Interior Alaska waterways thrive.







YOUNG SALMON LIVE HERE

Even in the winter, many streams, lakes, and wetlands provide habitat for salmon throughout their life cycle.



Photo Credit: Envision Mat-Su

Most young salmon spend years in fresh water before migrating out to the ocean. Young Chinook (King) salmon spend 1-2 years in fresh water before their migration to the ocean. When salmon hatch from their eggs, they are less than an inch in size. These baby salmon usually leave the spawning grounds chosen by their parents to find a better nursery habitat - often traveling many miles to do so. Wetlands and tiny creeks make ideal nursery habitats for baby salmon. You may have noticed these wetlands and streams trickling through your neighborhood or alongside trails by your home. If the habitat is healthy, these little water channels provide baby salmon:

-  Shelter from predators via large woody debris (“fish forts”).
-  Slower currents provide a place to rest.
-  Shaded areas with cooler temperatures.
-  Abundant meals of insects and other invertebrates.



See www.salmonproject.org for more info about salmon in our state.

WHAT MAKES A HEALTHY SALMON STREAM?



SALMON-FRIENDLY STREAM FEATURES



1: FLOODPLAIN

Floodplains are relatively flat areas - forested or wetlands - found alongside a stream channel which is prone to flooding.

Floodplain plants help filter water and reduce soil erosion and sediment loads that can damage the gills of young salmon. Plant roots and deadfall provide shelter for young & migrating salmon.

Baby salmon feed on insects that live in overhanging vegetation.

Floodplains are nature's own disaster control. A one-acre floodplain can store 1.5 million gallons of floodwater.

2: STREAMSIDE PLANTS

Trees and shrubs that border streams moderate the temperature through shading. This directly benefits fish and aquatic insects and prevents excess algae growth. Leaves, twigs, needles and whole trees that fall into water bodies provide nutrients to aquatic invertebrates, which in turn nourish fish.

3: "FISH FORTS"

Natural woody debris jams are generally not a barrier to salmon migration. Instead, they slow the current and help to create pools that provide shelter for juvenile salmon (especially during flood events).

4: RIFFLES

Riffles are gravel beds with shallow, turbulent water that serve as spawning areas for salmon. Depending on the water temperature, the eggs will incubate in the salmon nursery and hatch within 30 to 90 days.

Habitat means home. A healthy home for salmon is a stream free of pollution where a variety of interconnected water bodies support all life stages of fish and the organisms they depend on for food.



Photo by: Bob Christenson

BABY SALMON NEED CLEAN WATER

Salmon need water rich in dissolved oxygen; water that is not too acidic or too basic; a good supply of nutrients; and cool temperatures. Developing salmon eggs can easily be suffocated by sediment. Trampling stream banks or driving through streams can easily stir up sediment that coats and kills the developing eggs.



The Adopt-A-Stream program is a volunteer based effort coordinated by TVWA in partnership with the City of Fairbanks' Storm Water Advisory Committee. The goal is to get residents and local

businesses involved in monitoring the water quality of the local rivers, lakes and streams. Elements of the programs include water-quality monitoring, litter pick-up, stream bank restoration and maintenance, and management of flow restrictions. If you're interested in becoming involved

in this program visit our website at www.tvwatershed.org or for water quality questions visit the Alaska DEC Clean Waters at <https://dec.alaska.gov/water>.



Photo by: ©2012 Thomas C. Kline, Jr. / AlaskaStock.com








As a landowner adjacent to a salmon stream, you can play a role in promoting healthy salmon populations. The suggestions that follow show specific actions you can take to make your property safer for salmon.

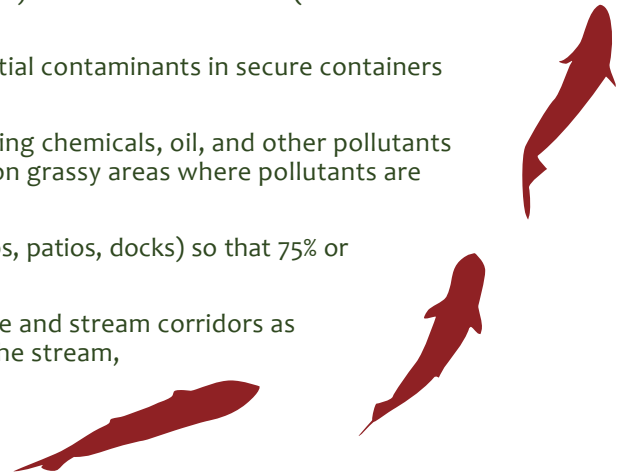


SALMON-FRIENDLY PRACTICES

Water quality in our local streams can be degraded by pollutants that enter into streams from homes, yards, and driveways. These pollutants include chemicals, fuels, oils, bacteria, sediment, and fertilizers.

Your waterfront may be a nursery for juvenile salmon or a spawning bed. Here are ways you can help protect their habitat and water quality:

-  Maintain naturally-vegetated stream banks and avoid obstructing the flow of a stream or altering a stream channel.
-  Minimize disturbances to the streambed (keep foot traffic, bikes, ATVs, and vehicles out of the stream). Incubating salmon eggs and young fry are highly vulnerable to siltation, vibration, and physical disturbances.
-  Allow the natural accumulation of woody/natural debris (“fish forts”) in the stream channel (but do remove any trash or household debris).
-  Store oil, grease, household chemicals, pesticides, and other potential contaminants in secure containers and dispose of them properly at the landfill.
-  Snow from driveways and streets can contain sediment, salts, de-icing chemicals, oil, and other pollutants harmful to streams. Store snow away from the stream, preferably on grassy areas where pollutants are filtered from the melted water before it flows into a stream.
-  Along your shoreline, plan access and outdoor amenities (e.g. gazebos, patios, docks) so that 75% or more of the shoreline edge is protected from foot traffic.
-  Maintain as much of the native vegetated buffer along the shoreline and stream corridors as possible. This helps sediments stay rooted and keeps them out of the stream, where they can damage salmon gills.



GIVE SALMON AN EDGE

Riparian Zones are areas where water and land meet, such as along stream banks and lake shores. As a landowner along a salmon stream, you can literally give salmon “an edge” in survival by retaining a fish-friendly riparian zone.

Riparian zones function in multiple ways, including providing cover for fish to avoid predators, stabilizing stream banks, filtering sediment, and supplying food and nutrients important for fish and other aquatic organisms.

Riparian buffers are corridors adjacent to streams where limited use or development occurs. Creating a riparian buffer on your property will help maintain high-quality salmon habitat and prevent streambank erosion by retaining vegetation that holds soil in place. In addition, a riparian buffer may provide added protection in the event of a flood. Structures that are located well outside the vegetated riparian buffer are not as vulnerable to rising water.

TABLE: RANGE OF RECOMMENDED BUFFER WIDTHS, BASED ON REVIEW PAPERS. MINIMUM, AVERAGE AND MAXIMUM WIDTHS ARE FROM SUMMARY PAPERS, WHICH REVIEWED MANY INDIVIDUAL STUDIES. A DASH INDICATES NO INFORMATION FOUND.

Riparian Feature or Process to Protect	Recommended Riparian Widths (feet) from Review papers			Citations
	Minimum	Average	Maximum	
Streambanks	30	54	100	Wenger (1999), Fischer and Fischenich (2000), Christensen (2000)
Floodwater Storage	65	—	entire floodplain	Fischer and Fischenich (2000), Wenger (1999)
Contaminant Filtering and Storage	13	70	164	Johnson et al. (1992), Straughan Environmental Services (2003), Mayer et al. (2006)
Habitat for Fish and Wildlife	33	393	1,000	Johnson et al. (1992), Fischer and Fischenich (2000) Wenger (1999)



Source: Coles-Ritchie, A Review of Riparian Functions and Management. Focused on the Fairbanks North Star Borough, Alaska. Completed for Tanana Valley Watershed Association, Fairbanks, Alaska, March 2009

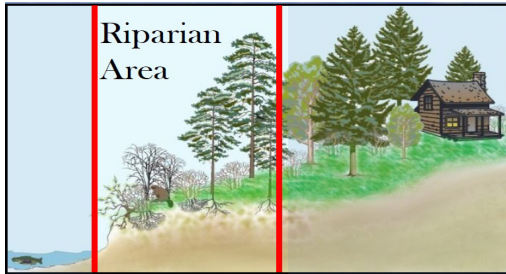
Full publication located on TVWA website at: www.tvwatershed.org/riparian-zone-information



LIVING STREAMSIDE: RIPARIAN AREAS

What is a RIPARIAN AREA or ZONE?

An area along waterbodies that serves as a transitional environment between water and land. These vegetated areas are an important component of a healthy water body and offer numerous benefits to people, fish, and wildlife.










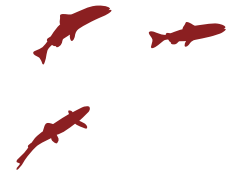
Riparian areas or zones are important and unique plant communities that form naturally along the edge of rivers and streams. This vegetative zone provides critical benefits to aquatic organisms like fish and other animals.



Riparian areas also provide valuable services like mitigating flooding and increased privacy to property owners adjacent to the river.

It is much easier and cost-effective to conserve, than to reconstruct, riparian zones. Removal of riparian vegetation all the way to the waters edge can result in:





-  Bank instability and loss of property from scouring of the river bank
-  Diminished water quality due to:
 -  Increased water velocity (speed) resulting in higher erosion
 -  Increased amount of sediment, nutrients, and other pollutants carried in overland runoff
-  Loss of native habitat for fish and wildlife
-  Downstream flooding events
-  Increased risk of invasive species







PROPERTY OWNER'S GUIDE

A "HOW TO" guide on keeping your RIPARIAN AREA healthy!

DO:

-  Leave natural vegetation in riparian areas intact
-  Replant a variety of native vegetation along your bank
-  Remove trash from your shoreline along the riparian area
-  Locate snow dumps away from waterbodies

DON'T:

-  Mow lawn up to water's edge
-  Modify your bank without consulting the appropriate permitting agencies
-  Discard animal waste, grass clippings, hazardous chemicals, and fertilizers near the water
-  Build permanent structures within the riparian area

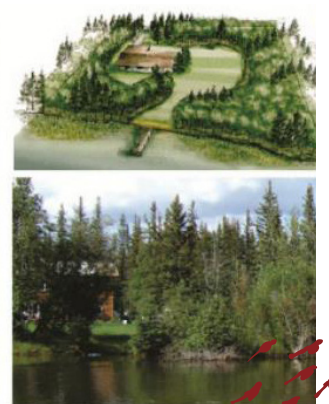
BAD



BETTER



BEST!



Typically, the larger the river the more vegetated area is needed to be maintained. Along the Chena River, a minimum of 50' wide strip of native vegetation is recommended. If your property is level and has structures built in the floodplain, a wider more substantial vegetative "buffer" may be needed to prevent flooding. Structures should be at least 300' from the waters edge, especially on a level lot.



For more information about healthy riparian areas or about bank modification of your lot, please contact USFWS.

STREAMSIDE PLANTS

By leaving natural vegetation in place and being careful not to disturb it, or by planting native salmon-friendly vegetation, you give salmon the edge they need. When restoring vegetation, make sure you use only native plants.



Photo Credit: USFWS/Katrina Mueller

Native plants occur naturally in a region and are not introduced. Once established, native plants require less maintenance than introduced or ornamental plants, and they maintain natural streamside habitat.

Invasive, non-native plants have the ability to displace native species, and they mature early, grow fast, and spread rapidly. Invasive examples include choke cherry, reed canary grass, bird vetch and white sweet clover.*

Invasive plants can potentially cross-pollinate with native plants and can also alter the soil composition. Their ability to out-compete native plants for water and nutrients can threaten local fish and wildlife habitat.

Some of the primary ways invasive plants are suspected to spread in Alaska are contaminated topsoil and gravel used in construction projects, trade and sale of invasive ornamental plants and contaminated potted plants, and dumping aquarium, and yard waste in natural areas.

* For more information about unwanted invasive plants visit:

<http://www.uaf.edu/ces/ipm/invasiveplants/> or <http://plants.alaska.gov/invasives/index.htm>



Elodea is a highly invasive non-native submersed aquatic plant. Elodea survives freezing, and can spread by tiny fragments. It's a popular aquarium plant in Alaska and can spread if released: boats, trailers, float planes, waders, and equipment can act as carriers. **Elodea may cause serious harm to fish and aquatic habitats in Alaska if allowed to spread unchecked.**

IF YOU FIND ELODEA OR OTHER INVASIVE PLANTS CALL : 1-877-INVASIV or



Fairbanks Soil and Water Conservation District at

(907) 479-1213 and

www.fairbankssoilwater.org

Resources for landowners interested in revegetating streambanks with native non-invasive plants:

Alaska Plant Materials Center
www.plants.alaska.gov

UAF Cooperative Extension
(907) 786-6300 | www.alaskainvasives.org

ENHANCING SHORELINE HABITAT FOR SALMON

If the shoreline on your property has been altered and does not contain adequate vegetation, it may no longer be functioning as healthy riparian habitat and may actually be harming salmon.



Being a salmon friendly landowner means protecting existing vegetation or restoring your shoreline so that it can function as habitat for salmon and other aquatic species.

Cost share options are available to assist landowners interested in enhancing their shoreline habitat for salmon.

Contact the Alaska Department of Fish & Game Cost Share program, or the US Fish and Wildlife Partners program if you are interested in learning more.



The photo above shows a lake shoreline where the landowner cleared all the vegetation to the shoreline and is now trying to manage erosion.



The photo on the bottom left shows a creek shoreline that has been cleared of vegetation due to sport fishing.



The photo on the bottom right shows a group of volunteers replanting and restoring a shoreline.



SALMON-FRIENDLY LAWN CARE

“Slow it down, spread it out, and sink it in”








Rainfall and snowmelt make their way from the mountain peaks to residential neighborhoods and ultimately into Interior Alaska’s streams and lakes.



Rain garden installation at the Carlson Center, Fairbanks

Rainwater and snowmelt collect soil particles, organic debris, fertilizers, pesticides, gas, and oil as they make their way from higher elevations into our water bodies. If Interior Alaska area residents make their land permeable, much of that water can be filtered harmlessly into the soil.

If you have a lawn or gardens, they can help trap and filter pollution and sediment before they get into our streams. High grasses, shrubs, and trees are better at slowing runoff. A few simple steps you can take to prevent pollution runoff into our salmon streams are:

-  Allow your lawn to grow an inch or two higher than normal in between mowing.
-  Put a rain barrel under gutter downspouts and re-use the rainwater or build a rain garden. Creating a rain garden or landscaping with native plants can be very beautiful and is often less maintenance than a conventional flower garden.
-  When washing your car, do it on a grassy surface rather than in your driveway.
-  Choose gravel driveways, use grass mesh or permeable paving.
-  Use organic fertilizers and apply them sparingly because even chemical-free varieties can leach nitrogen, phosphorous, and other nutrients into our streams and lakes.
-  Minimize the size of your lawn especially adjacent to water bodies and locate your lawn as far away from a water body as possible.
-  Keep natural riparian zones along the streamside. Willows, shrubs, and other plants can be trimmed to keep a river view, while providing healthy salmon habitat.



CULVERTS

Providing safe passage is essential to ensuring sustainable salmon populations throughout Alaska.



Examples of culverts that do not allow fish passage.

If you have a culvert on your property and it resembles any of these photos, it is likely that it does not allow young or adult salmon to pass freely! All of the images on the left, show culverts that block fish passage and prevent salmon from accessing essential habitats. If you think that this is an issue on your property, you can contact Alaska Department of Fish and Game and ask them to assess whether or not your culvert allows safe passage for salmon.

Funds from cost share programs like the Fish Passage Program at the US Fish and Wildlife Service **may be available to assist landowners** in replacing their culverts with fish friendly culverts.

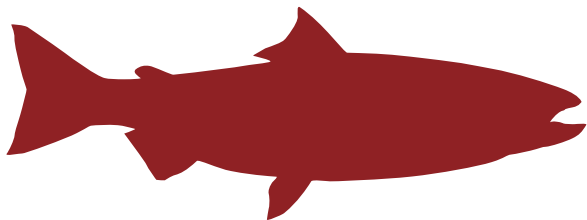
To have your culvert assessed contact the ADF&G Fish Passage Improvement Program Coordinator or the U.S. Fish and Wildlife Service Fish Passage Program with USFWS.



YOUR SEPTIC SYSTEM

Failed or inadequately-maintained septic systems can cause serious pollution problems in salmon streams and may be a public health hazard.

Landowners who are not on a public sewer system need to regularly maintain their septic systems, according to Alaska Department of Environmental Conservation, Division of Water Quality. This means having your system inspected annually and pumping your septic tank regularly.



Warning signs that a septic system is failing:

- Grass over the drain field has patches which look abnormally healthy.
- There are soggy areas, surfacing grey water, or surfacing sewage.
- Grass above the drain field is unusually wet.
- Sinks, showers and toilets drain more slowly.
- Sewage backs up in the toilet and drains.
- Your drain field is smelly!

RECREATING WITH SALMON

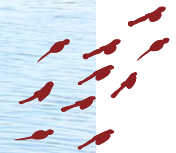
Alaskans enjoy an outdoor lifestyle and crossing streams or rivers is often necessary to get to our favorite recreational sites. You can help us protect baby salmon!



Motorized users can play a key role!

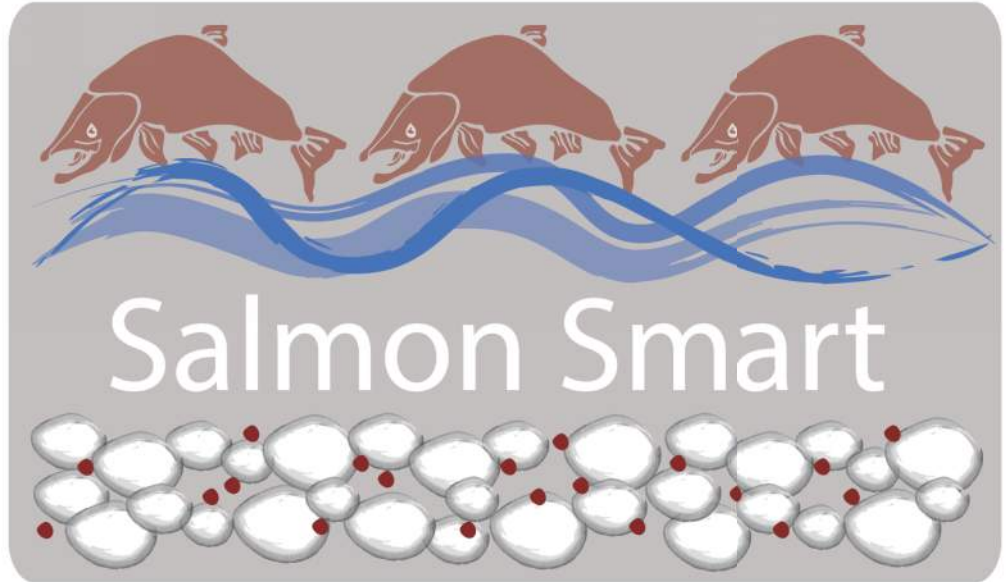
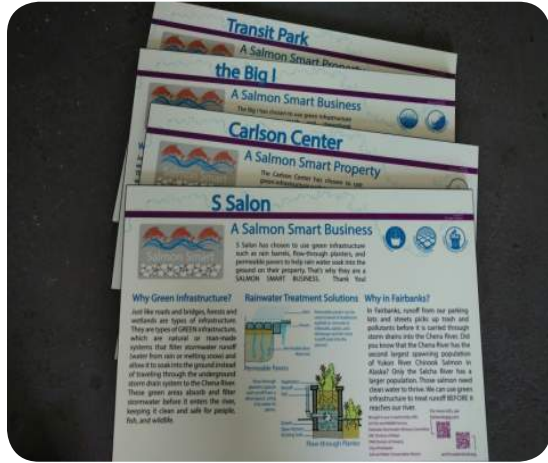


- Ensure sensitive spawning gravels and salmon eggs are not disturbed.
- Ensure excessive sediment is not discharged into the stream by only using permitted stream crossings.
- Keep an eye out for juvenile salmon and other fish while recreating.
- Contact ADF&G for maps of permitted river and stream crossing areas.



ADF&G Division of Habitat can provide maps of permitted crossings. For more information, call (907) 459-7289 or visit online at www.adfg.alaska.gov/index.cfm?adfg=uselicense.crossing

BECOMING A SALMON SMART BUSINESS



In Fairbanks, rain that falls on our parking lots and streets picks up trash and pollutants before it is carried through storm drains to the Chena River. Did you know that the Chena River has the second largest return of Yukon River Chinook Salmon in both Alaska and Canada?! Only the Salcha River has a larger return. Those salmon need clean water to thrive. We can use green infrastructure to treat runoff BEFORE it reaches our river.

SPOTLIGHT: SALMON SMART BUSINESSES

Salon is a local, Fairbanks business that has chosen to use green infrastructure such as rain barrels, flow-through planters, and permeable pavers to help rain water soak into the ground on their property. That's why S-Salon is a SALMON SMART BUSINESS. Thank You!



Above: S Salon,
after



Above: S Salon before



Left: Rain barrel
at S Salon



SPOTLIGHT: SALMON SMART BUSINESSES

The Big I is another Fairbanks business that has chosen to utilize a rain garden, permeable pavers, and grass mesh all installed just before the bank by the boat ramp to help with the storm water run-off before it reaches the Chena River. **That's why the Big I is a SALMON SMART BUSINESS. Thank You!**



Above: The Big I site on the Chena River, before

Above right: Permeable pavers

Right: The Big I site, after



SPOTLIGHT: SALMON SMART PROPERTIES

The Bus Depot in downtown, Fairbanks on Cushman Street has had permeable pavers and a type of rain garden installed in order to filter the run off water from the parking lot and let it infiltrate before going down a storm drain. **That's why the Bus Depot is a SALMON SMART PROPERTY. Thank You!**



Above: Bus depot, before

Right, top: Permeable pavers, after

Right, bottom: Signage and mulch, after



About Interior Alaska Land Trust (IALT)

IALT is a private, non-profit, tax-exempt organization, started in 1995. Its mission is to safeguard the character of the land and the natural resources of our community by working with Interior Alaska landowners to acquire, protect, or manage natural, scenic, recreational, agricultural, historic, or cultural aspects of property.

Chena Riverfront Commission (CRFC)

The mission of the joint City of Fairbanks/Fairbanks North Star Borough - Chena Riverfront Commission is to provide specific policies to guide responsible development along the Chena River corridor from its mouth at the Tanana River to its source, including its several tributaries.

About Great Land Trust (GLT)

GLT is a non-profit land conservation organization whose mission is to work with willing landowners and other partners to conserve Southcentral Alaska's lands and waters.

Since its establishment in 2006, **Tanana Valley Watershed Association's (TVWA)** board and staff members have worked to provide information on the condition of the Tanana Valley watershed.

TVWA believes public awareness will enable individuals to understand how their actions impact water quality and habitat for fish and wildlife.

Tanana Valley Watershed Association's Mission:

To promote and improve the health of Tanana Valley through education, restoration, collaborative research, and diverse community involvement.



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