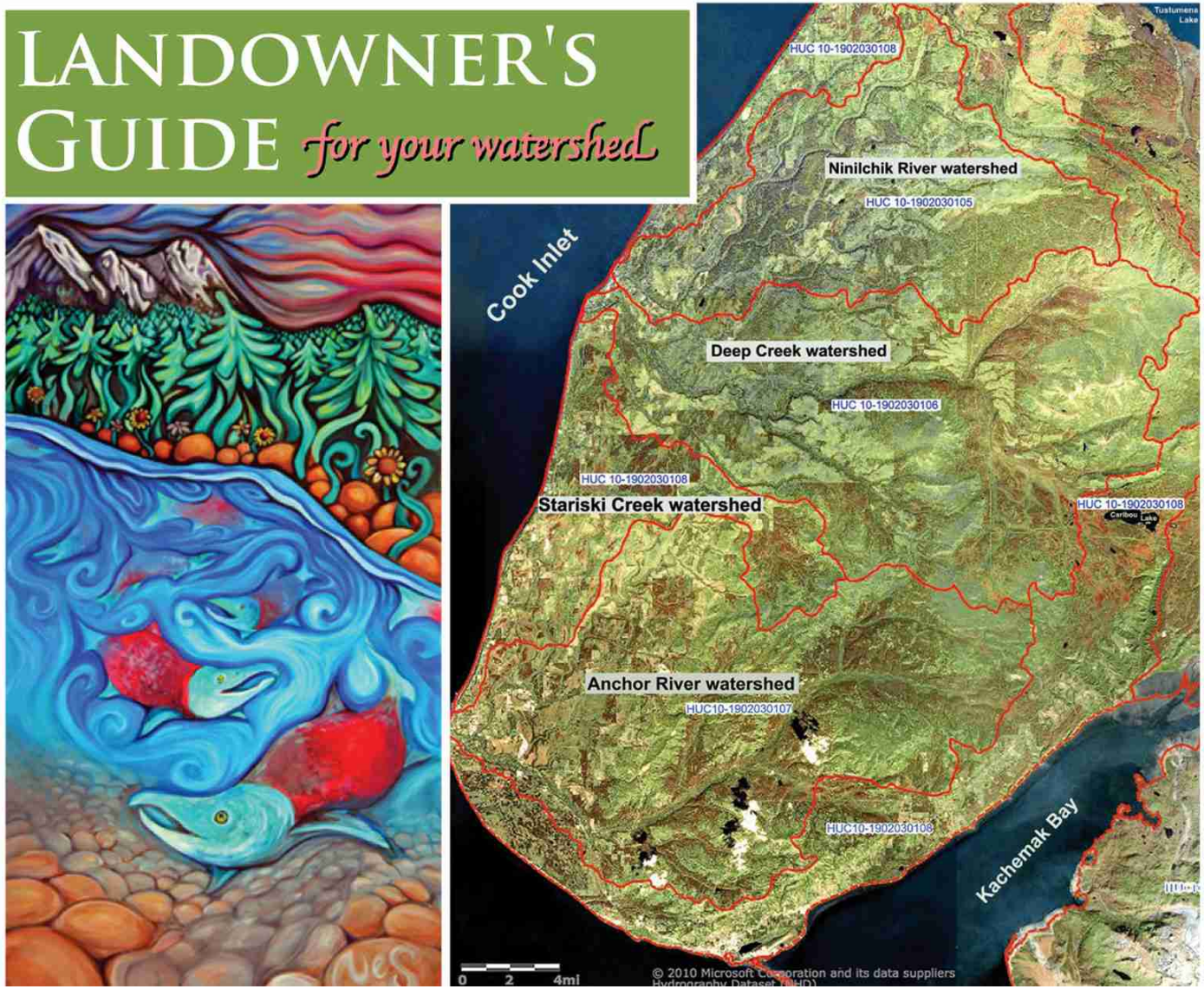
This pdf will introduce you to our project to develop two landowner's guides:
one for **Anchor River and Stariski Creek**,
one for **Deep Creek and Ninilchik River**

Introduction to the Landowner's Guides

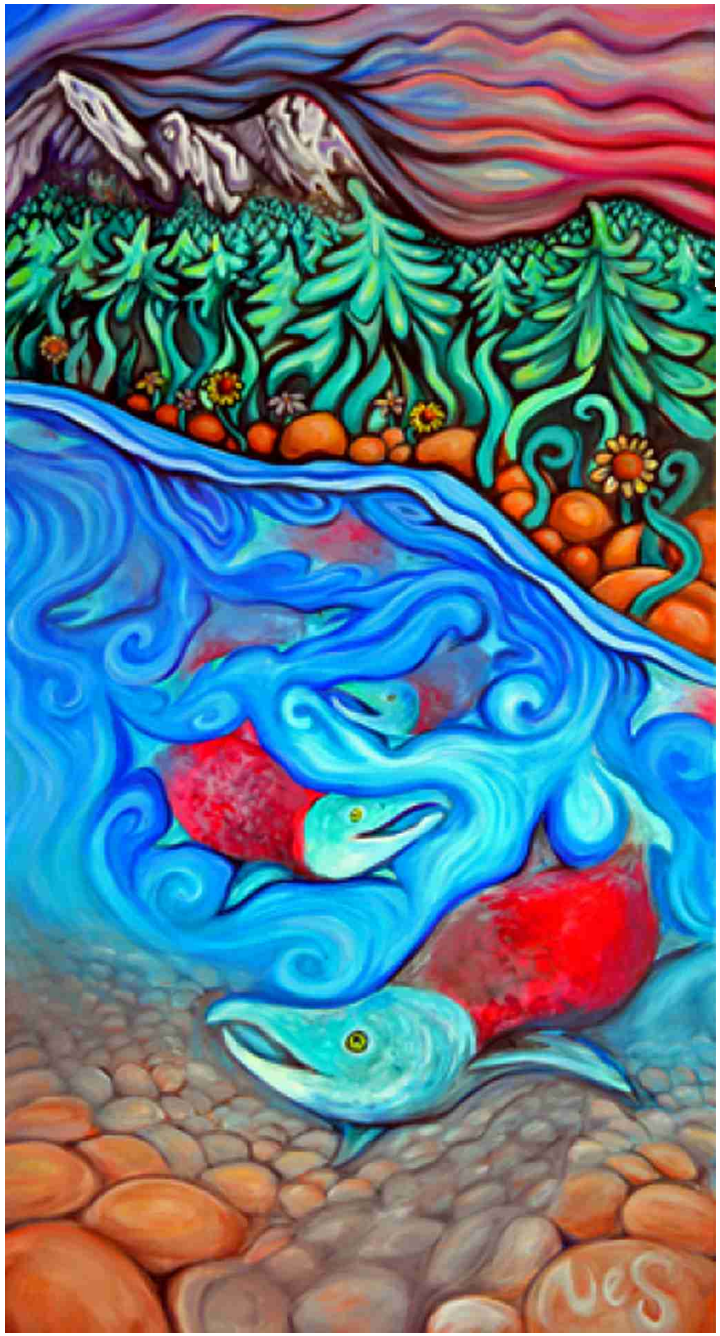
Contents of Landowner's Guides watershedipedia
There will also be opening write-ups with background to the watershedipedia.

Send comments



Map of watershed boundaries developed by HSWCD from http://www.arcgis.com/home/webmap/viewer.html?useExisting=1

*Contact **Homer Soil and Water Conservation District** online at www.homerswcd.org, email devony@homerswcd.org, or call 235-8177, ext 106.*



Landowner's Guide *for your watershed*

Welcome to this introduction to your landowner's guide. If you live in one of the four watersheds shown below, we're developing a landowner's guide for you. We're doing this because **these watersheds support important and healthy populations of wild-born salmon, and you can help keep them that way.**

Throughout these watersheds, salmon return in large numbers to nursery streams to spawn and produce the next generation. From pea-sized eggs that incubate in cool, well-oxygenated gravels, tiny salmon hatchlings emerge and fan out into various watershed habitats to feed and grow. Depending on the species, their rearing travels will take them into lakes, mainstem river channels, small tributaries, or tiny headwater streams flowing almost invisibly through peatlands and meadows in the farthest reaches of the watersheds. After rearing in these habitats, juvenile salmon—now called smolts—will follow watershed rivers down to Cook Inlet and then out to sea. Traveling the northern Pacific for from 1 to 7 years (depending again on species), they'll find abundant food and grow to adult size. When they're big, shiny, and silver, some force will draw them homeward at their appointed time, back to the Anchor or Ninilchik River, to Stariski Creek or Deep Creek, back home to spawn and die and repeat their parents' cycle.

Maybe salmon in some strange way can feel lucky to come home (they do look like they've won the watershed lotto in Vanessa Stark's beautiful poster to the left*). If so, then the salmon that come home to your watershed must feel among the luckiest in the world because so much of the watershed they come home to offers them ideal conditions for what they and their offspring must do. And as we said above, you can help keep it that way.

With a little knowledge and commitment from watershed landowners, salmon habitats can remain healthy and productive. With a little care, we can avoid the fate of many watersheds in Washington, Oregon, California, and parts of Canada. There, federal and state agencies and dozens of local and national organizations spend millions of dollars trying to restore salmon populations to levels that we enjoy and take for granted. When available early next year, the landowner's guide should help you find the knowledge you need to keep your lands and waters salmon-friendly so the salmon can keep coming home.

* visit: http://www.thinksalmon.com/salmon_art/item/stewardship_pemberton_society/

*Contact **Homer Soil and Water Conservation District** online at www.homerswcd.org, email devony@homerswcd.org, or call 235-8177, ext 106.*

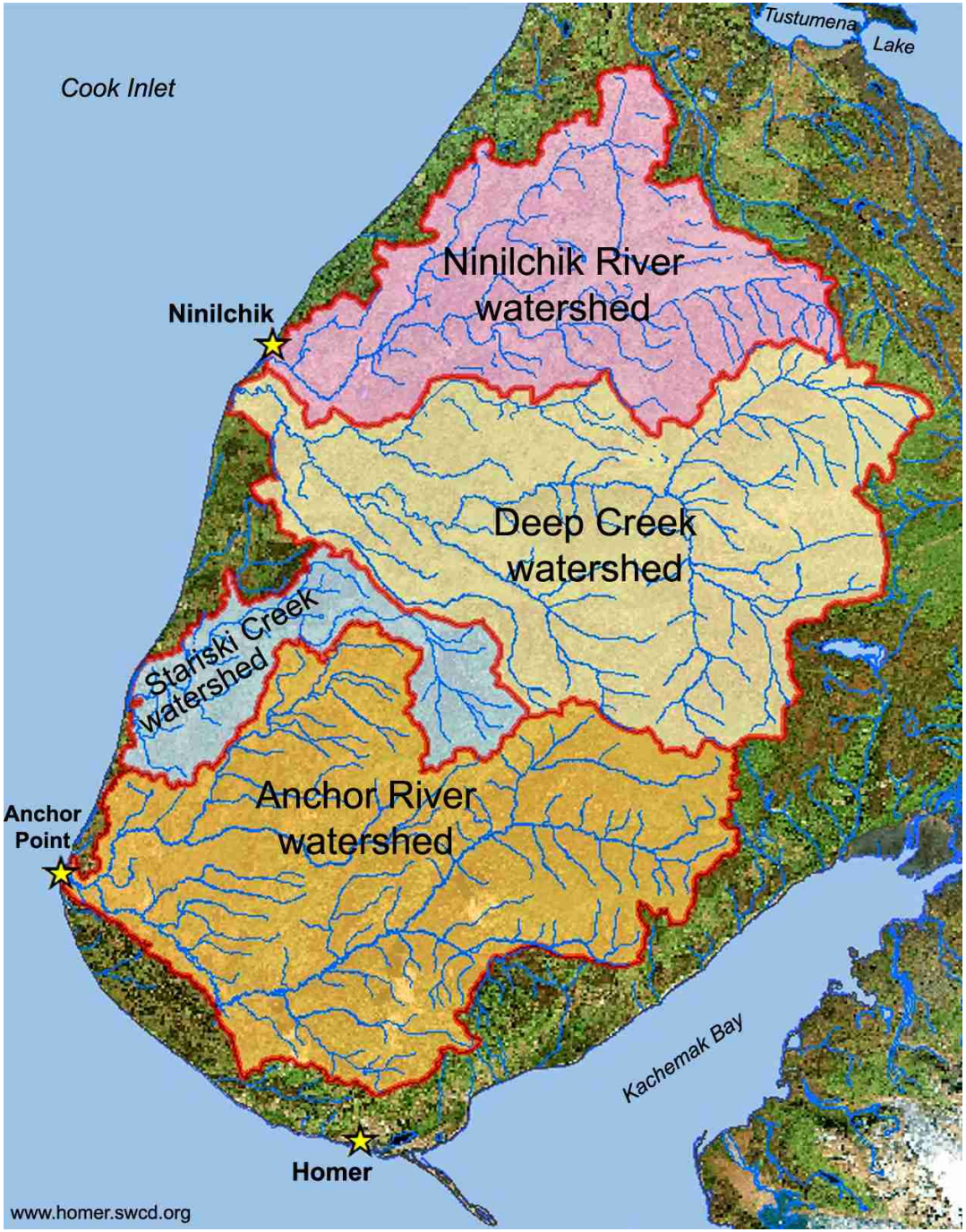
TWO LANDOWNER'S GUIDES: There will be two landowner's guides when we finish compiling, synthesizing, formatting, and pulling together helpful and interesting information about your watershed. One will cover **Anchor River and Stariski Creek watersheds**; the other will cover **Deep Creek and Ninilchik River watersheds**.

GETTING UP TO SPEED: The landowner's guides will include five short opening articles to get you up to speed on some key ideas. An example is an introductory article on soils in your watershed. This article will help you find out what kinds of soils occur on your property, and will explain why it's so important to know if your soils have "limitations" that will make some land uses problematic or unexpectedly expensive. If you're looking to buy property in one of these watersheds, this information can help you choose land that has conditions that meet your needs.

WATERSHEDIPEDIA: A lot of specific information will be provided in an alphabetical "watershedipedia" covering over 200 topics (draft topic index for the Anchor River-Stariski Creek landowner's guide.) If you think of a topic you'd like us to include, let us know before November 30, 2011, and we'll see what we can do.

Throughout the watershedipedia, we'll try to use this symbol whenever we discuss basic actions that landowners can take to help keep their lands and waters and their neighborhoods "salmon-friendly."

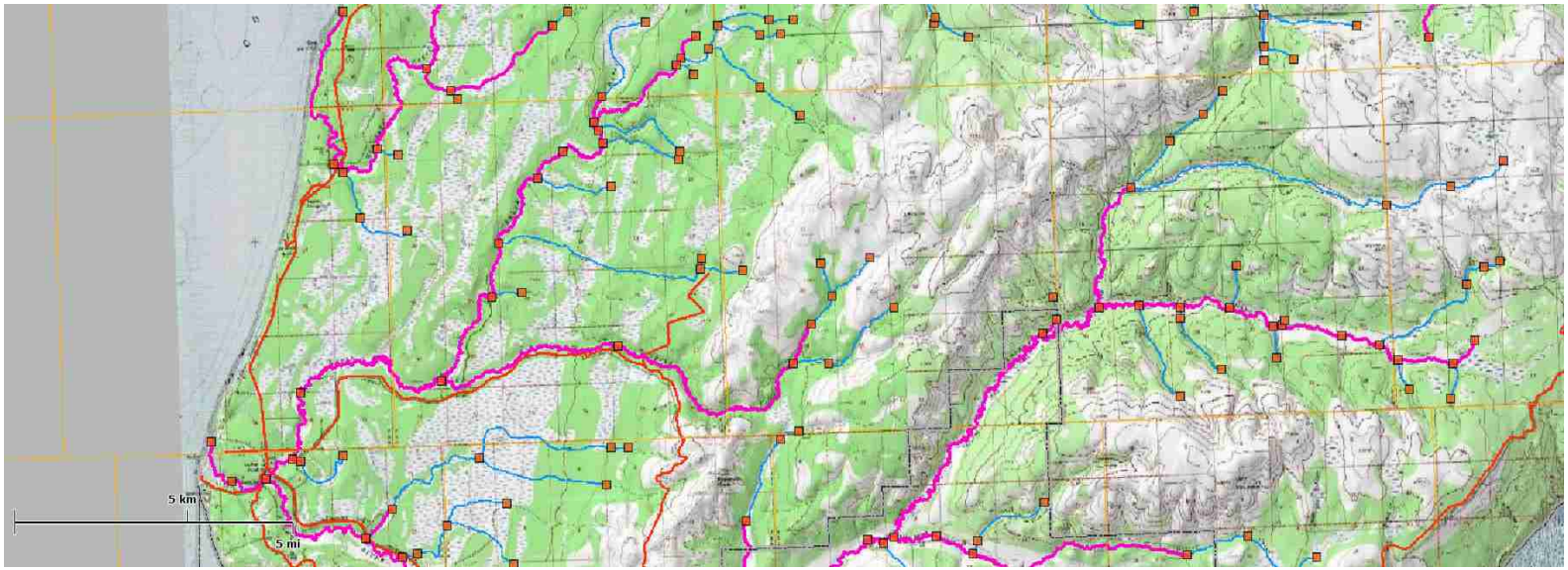
To make information as interesting and easy to understand as possible, we'll rely heavily on maps, photos, sketches, illustrations, and other graphics. And throughout the landowner's guides, you'll find links that will take you to websites that provide additional information on whatever topic is being discussed. The following pages offer some examples of the kinds of things you'll find in the landowner's guides.

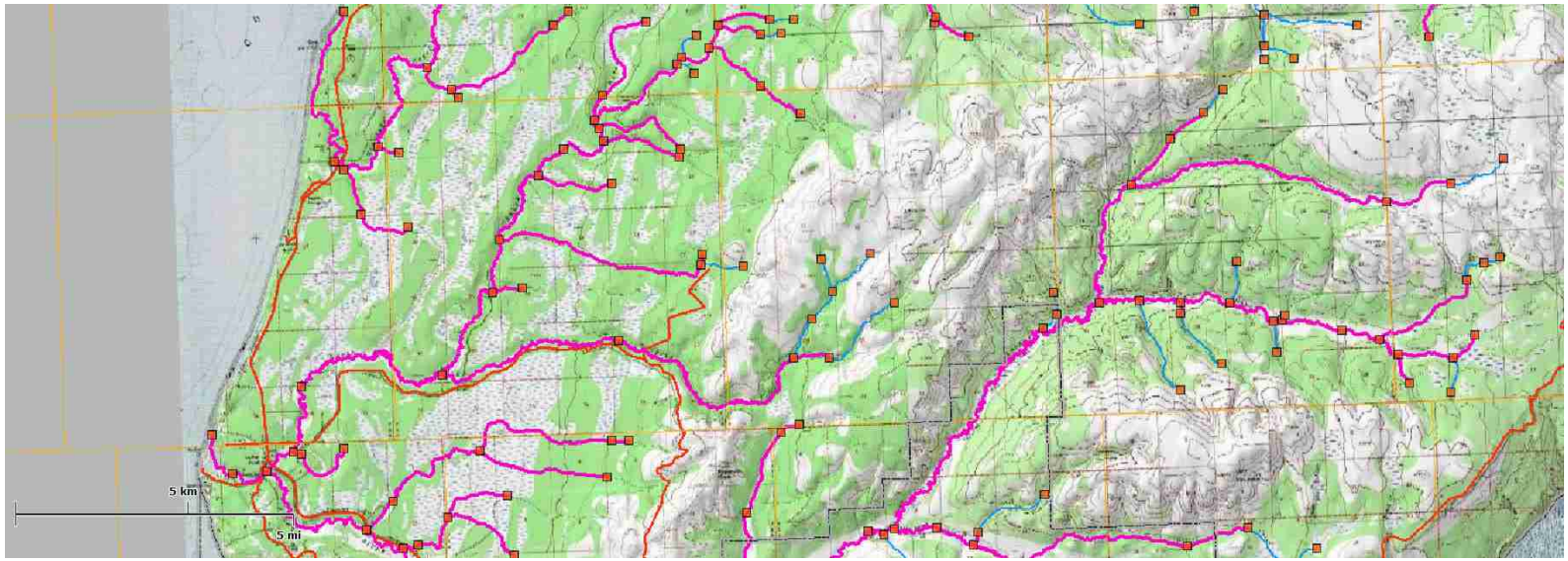


*Contact **Homer Soil and Water Conservation District** online at www.homerswcd.org, email devony@homerswcd.org, or call 235-8177, ext 106.*

In the landowner's guides, you'll find maps like these...

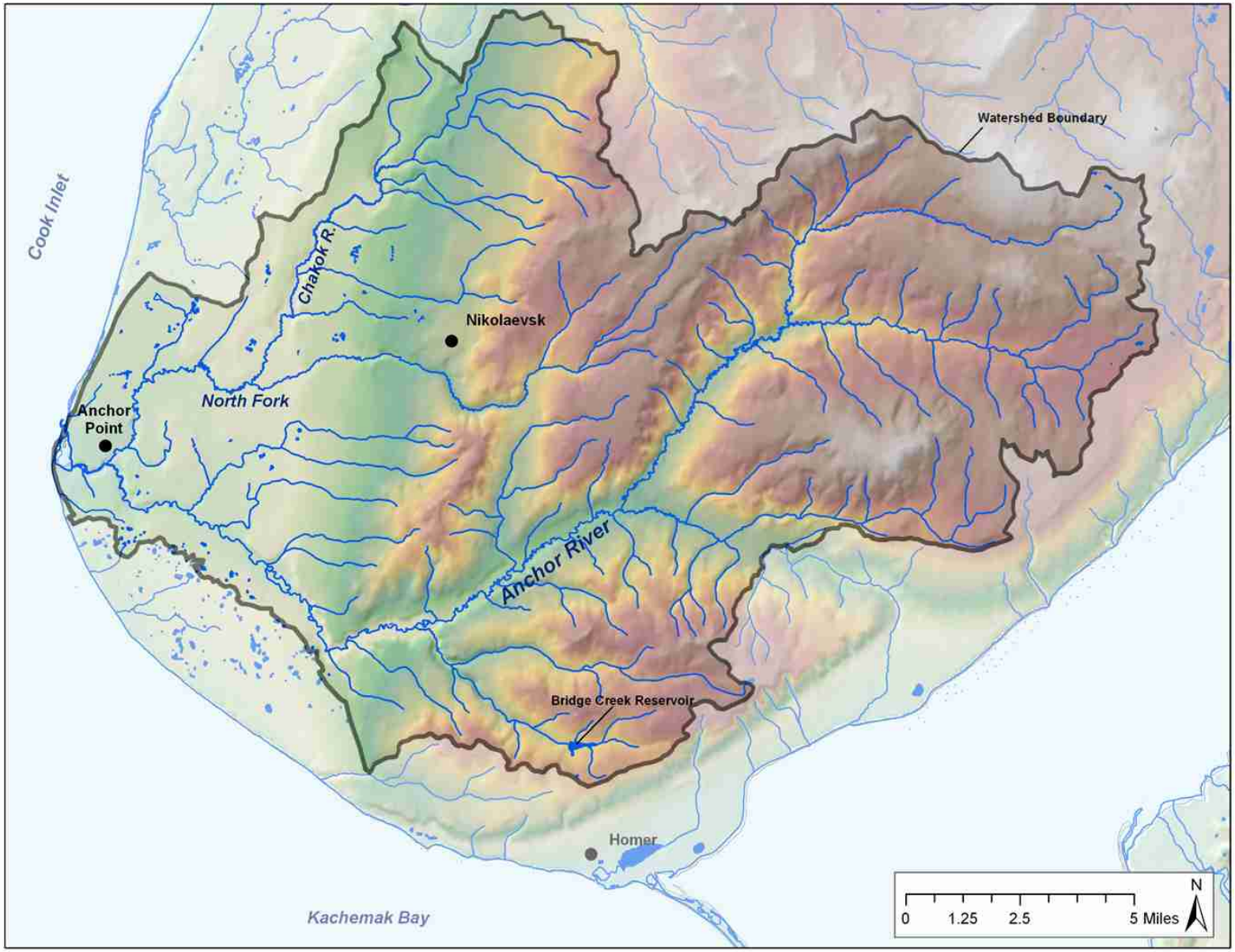
These maps show where chinook salmon (top) and coho salmon (bottom) are known to occur in part of the Anchor River watershed.
(Source: "Anadromous waters catalogue" compiled by the ADF&G, http://www.adfg.alaska.gov/sf/SARR/AWC/index.cfm?ADFG=maps.interactive.)





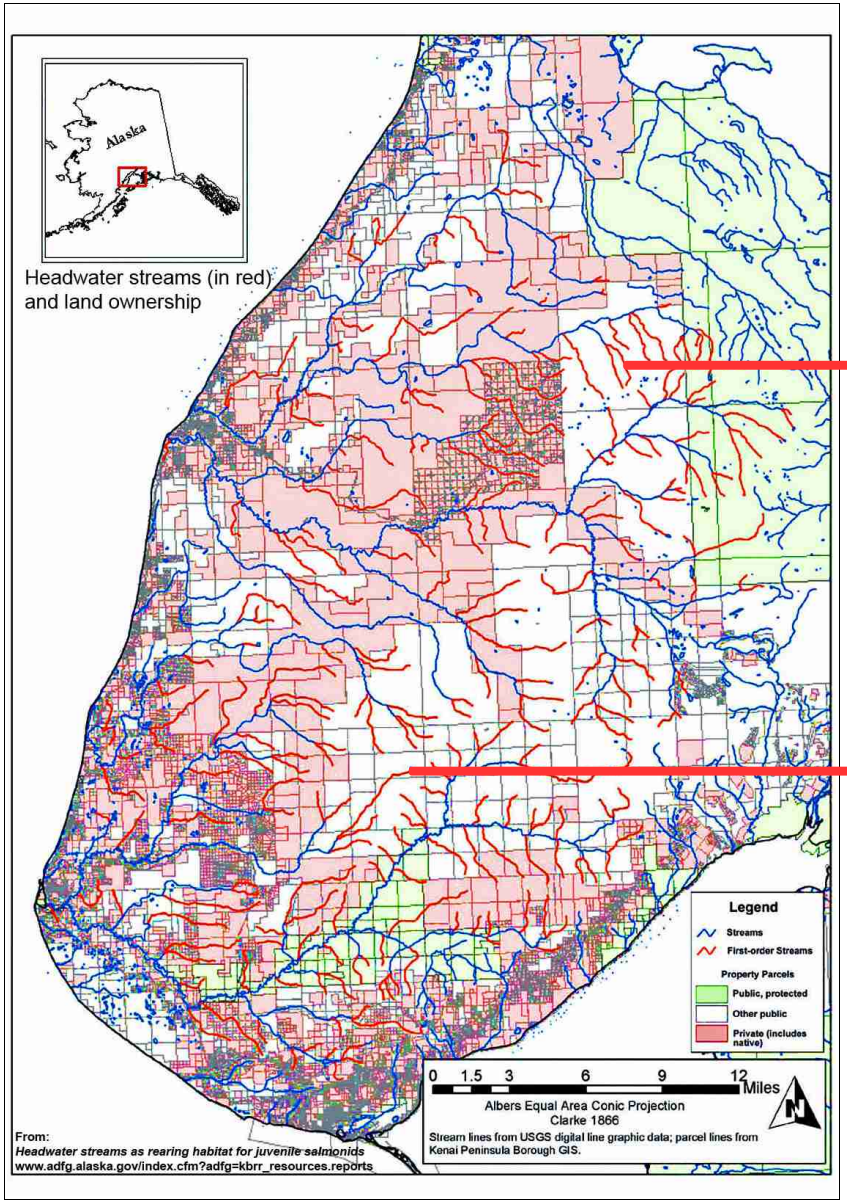
*Contact **Homer Soil and Water Conservation District** online at www.homerswcd.org, email devony@homerswcd.org, or call 235-8177, ext 106.*

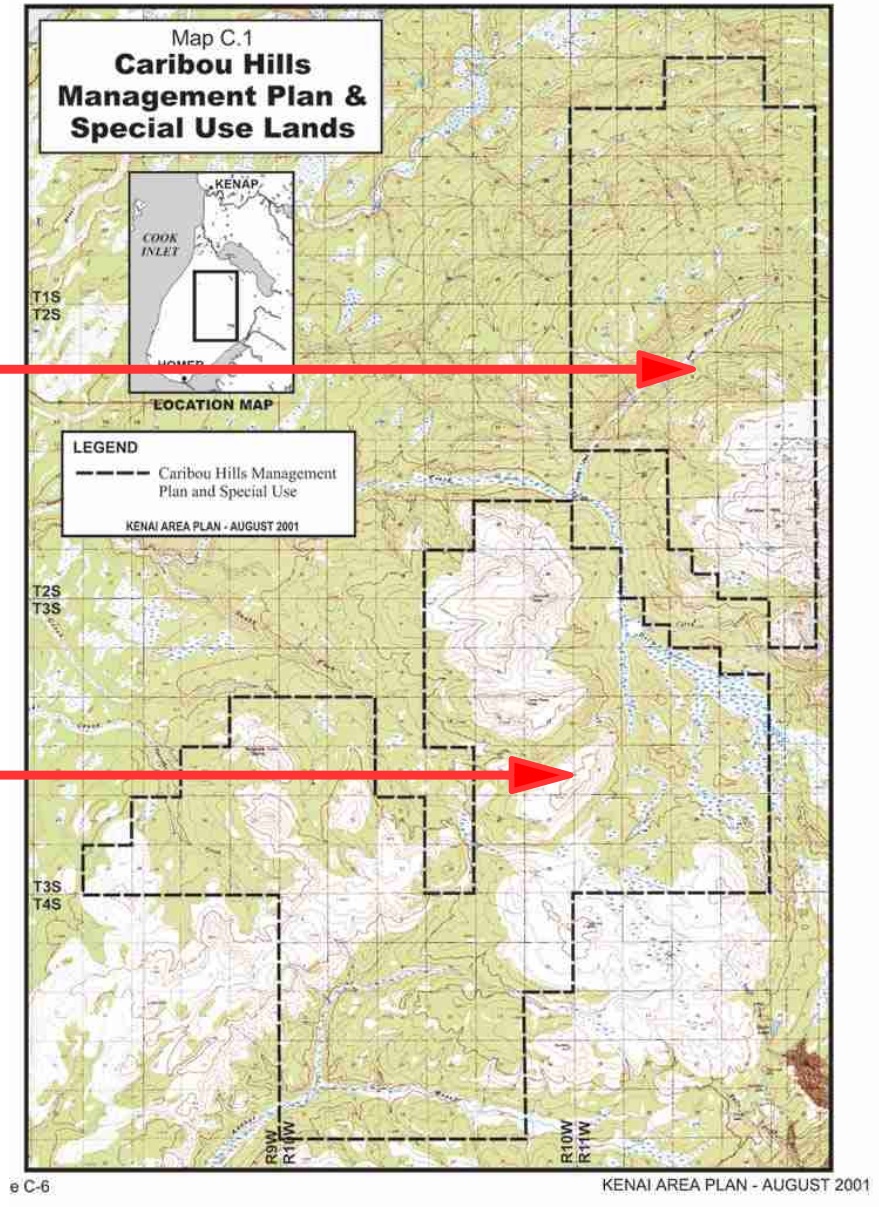
You'll find maps like this, which shows the Anchor River watershed with its major tributaries, lakes, and ponds.
(Source: developed by the Kachemak Bay Research Reserve, http://www.adfg.alaska.gov/index.cfm?adfg=kbrr.home.)



*Contact **Homer Soil and Water Conservation District** online at www.homerswcd.org, email devony@homerswcd.org, or call 235-8177, ext 106.*

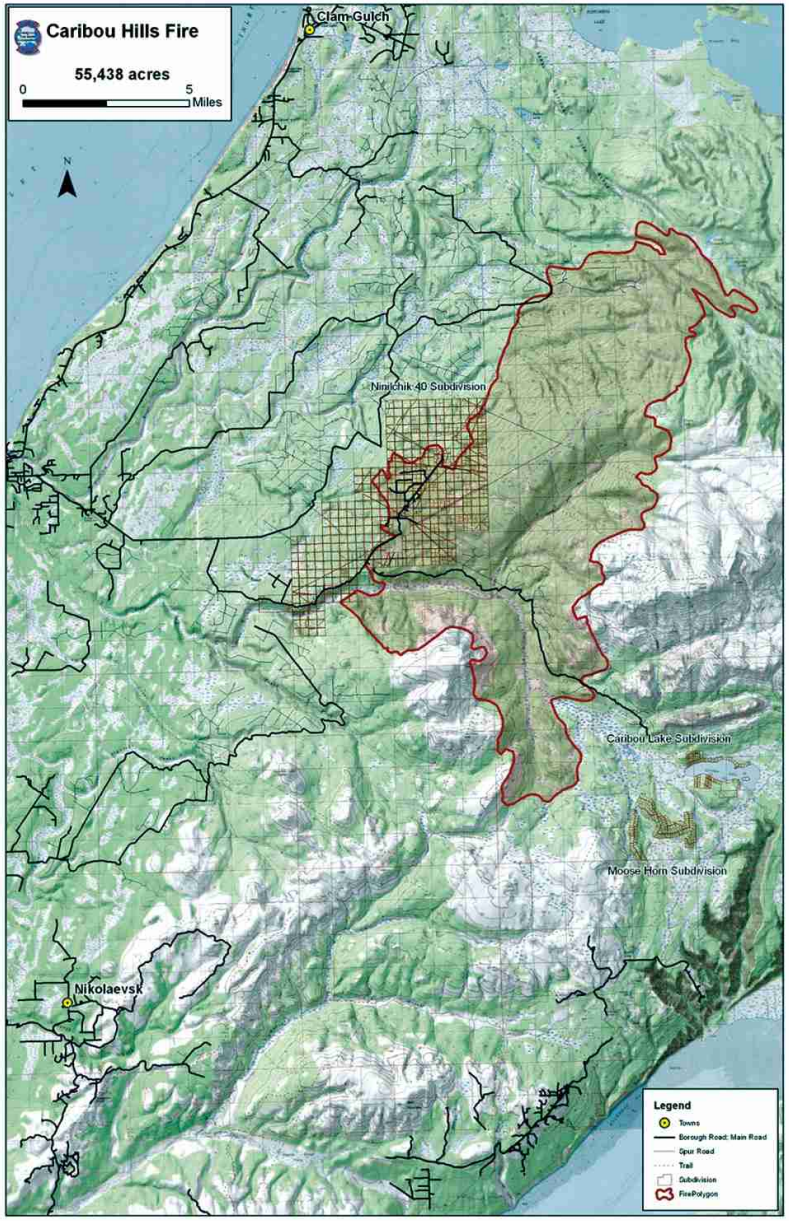
You'll find maps like these, which show salmon headwater streams (left) and the state-owned Caribou Hills Special Use Lands (right).
(Source is printed at the bottom of each map.)

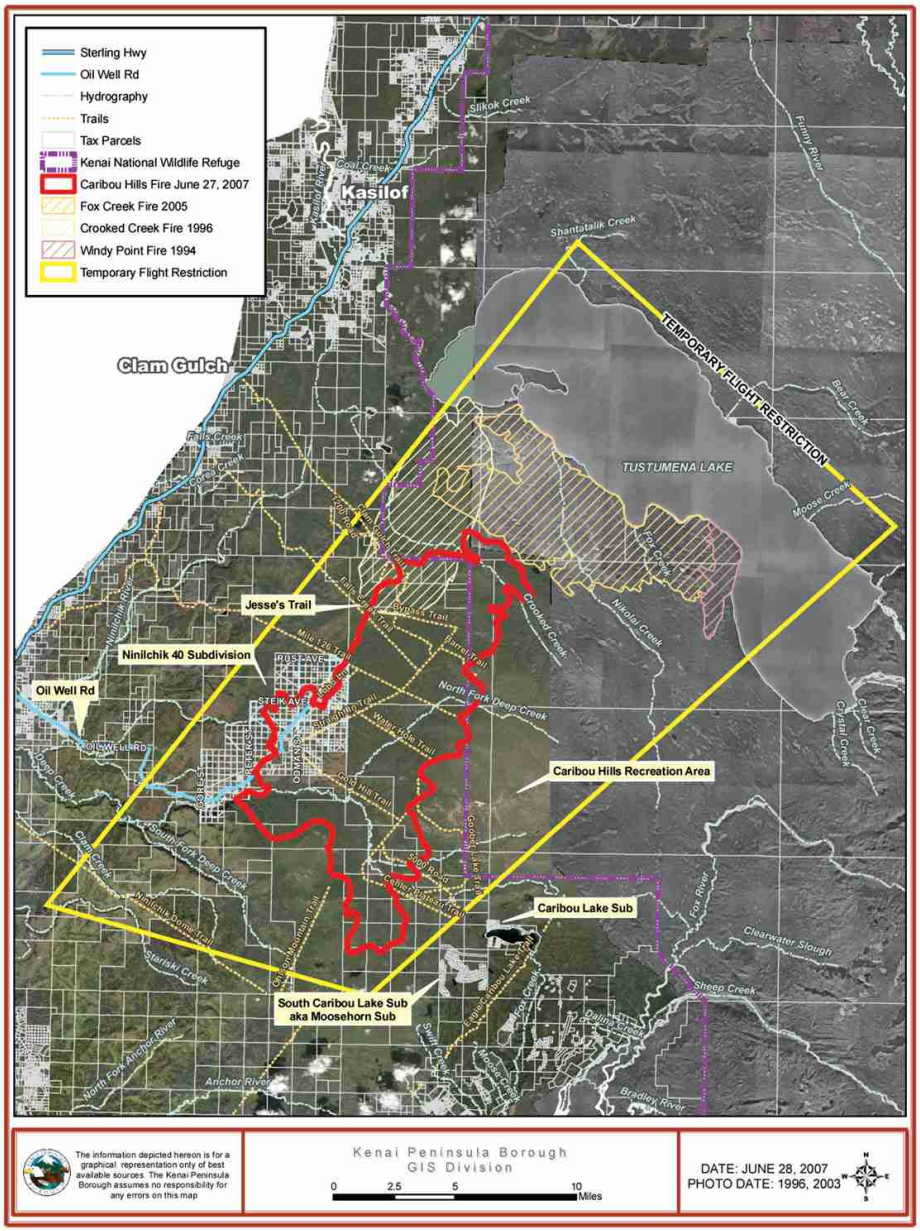




*Contact **Homer Soil and Water Conservation District** online at www.homerswcd.org, email devony@homerswcd.org, or call 235-8177, ext 106.*

You'll find maps like these, which show the area of the 2007 Caribou Hills fire (left) and recent fire history in the same area (right).
(Source: Kenai Peninsula Borough, Office of Emergency Management, http://www2.borough.kenai.ak.us/emergency/Fire/2007/CH/CHFire.htm.)



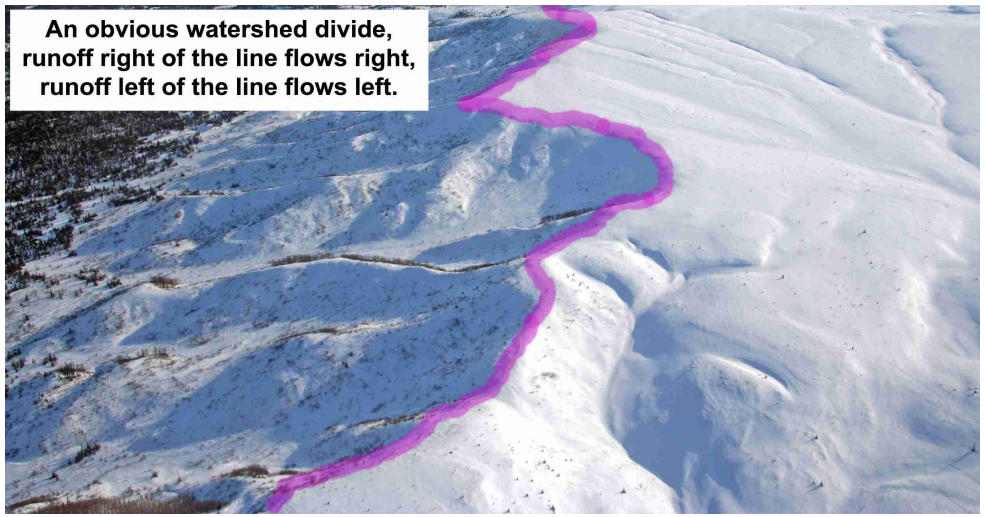


*Contact **Homer Soil and Water Conservation District** online at www.homerswcd.org, email devony@homerswcd.org, or call 235-8177, ext 106.*

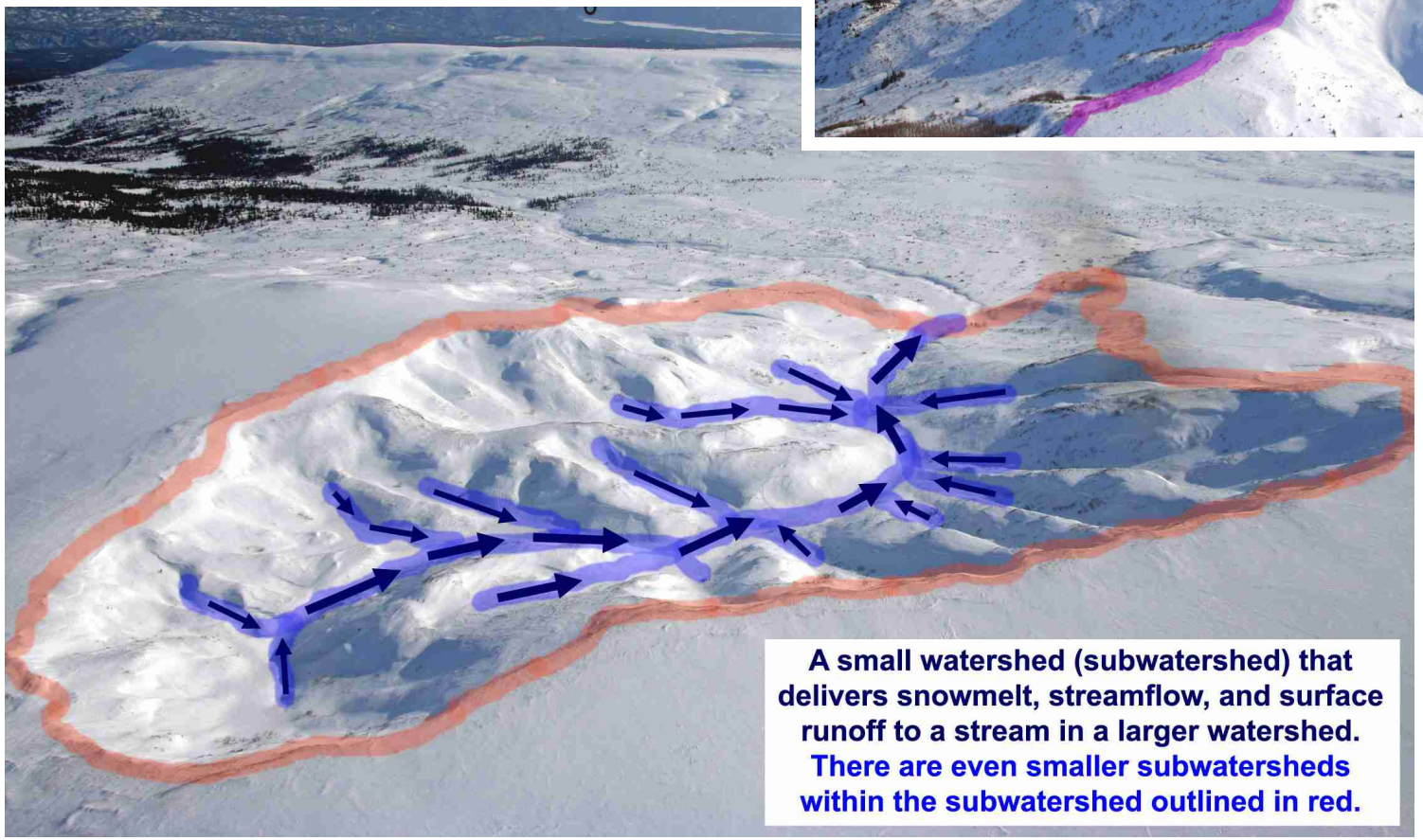
In the landowner's guide, you'll find explanations like these...

What's a watershed?

A watershed is an area of land within a single drainage basin. It's kind of like a landscape-sized bathtub. All rain or snow landing within the basin (the tub) drains to the same river, lake, or bay (the drain) unless it evaporates or gets used by plants, animals, or people. Any watershed will have smaller subwatersheds within it. Really big rivers like the Yukon have immense watersheds (the Yukon drains about 225,000 sq mi). In contrast, the **Anchor River** drains about 224 sq mi (143,120 ac), **Deep Creek** about 218 sq mi (139,785 ac), **Ninilchik River** about 136 sq mi (87,037 ac), and **Stariski Creek** about 55 sq mi (35,401 ac).



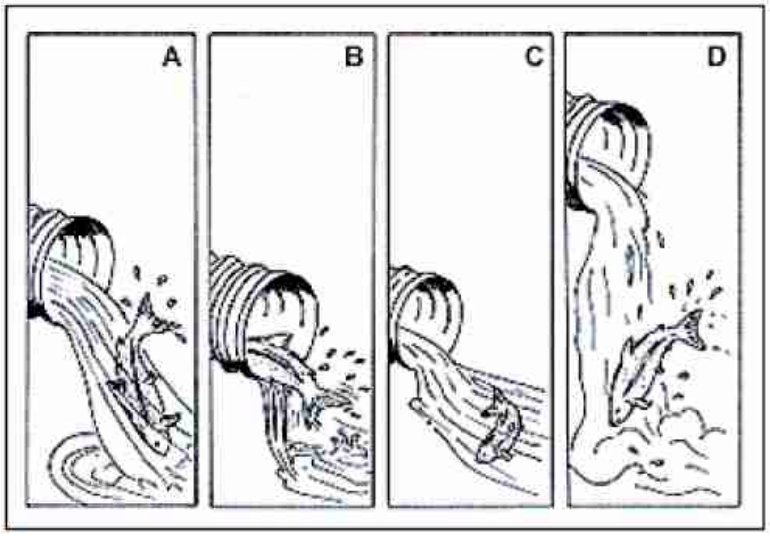
An obvious watershed divide, runoff right of the line flows right, runoff left of the line flows left.



A small watershed (subwatershed) that delivers snowmelt, streamflow, and surface runoff to a stream in a larger watershed. There are even smaller subwatersheds within the subwatershed outlined in red.

*Contact **Homer Soil and Water Conservation District** online at www.homerswcd.org, email devony@homerswcd.org, or call 235-8177, ext 106.*

Culverts



Improperly designed or installed culverts prevent fish from swimming through them , thus blocking fish passage and access to potential habitats upstream or downstream of the culvert. A single culvert may block fish passage to large areas of a watershed.

Culverts may block fish passage in a number of ways. Four are illustrated in the drawing at left (from Evans and Johnston, 1980).

A: Velocity of flow through culvert too fast for fish to swim against.
B: Water depth in culvert too shallow for fish to swim in.
C: No resting pool at outlet of culvert.
D: Culvert perched above stream level too high for fish to jump.

Small juvenile salmon may have even more difficulty passing through problem culverts than larger adults, preventing them from accessing rearing or overwintering areas, or from traveling downstream as smolts.

Photographs below show a perched culvert replaced with a properly installed culvert.

Below left: the culvert is perched, preventing fish passage. Below right: the culvert has been replaced and is at the proper depth for streamflow.

The undersized, partially perched culvert in the center was replaced by a properly sized and installed culvert on Beaver Creek, an anadromous tributary of the Anchor River. Note how deeply the culvert was set into the stream so that stream channel conditions could be created within it.

(Source: photos by Homer Soil and Water Conservation District.)

Elevated, light-penetrating walkways and decks, also called "gratewalks" (Photos: ADF&G)

These elevated walkways protect from erosion the streambanks you walk on or fish from, and they help maintain salmon habitat. For a successful gratewalk, follow the requirements listed below. (Contact the Gilman River Center at http://www.kenairivercenter.org/index.htm for more help and guidance.)
Make sure that:

- decking provides at least 60 percent light penetration,
- the length of the gratewalk is no more than 1/3 the length of the parcel's river frontage,
- the width of the gratewalk is 8 feet or less,
- the gratewalk is elevated at least 4 inches above the ground (everything except its pipe supports),
- no pipe supports are located below ordinary high water,
- no pipe supports are driven permanently into the ground,
- the gratewalk is of lightweight construction and is seasonally removed.

Soils for salmon (an example from Washington state)

SOILS for SALMON

Building the Soil for Healthier Landscapes and Healthier Streams

2005 Update

http://www.soilsforsalmon.org/

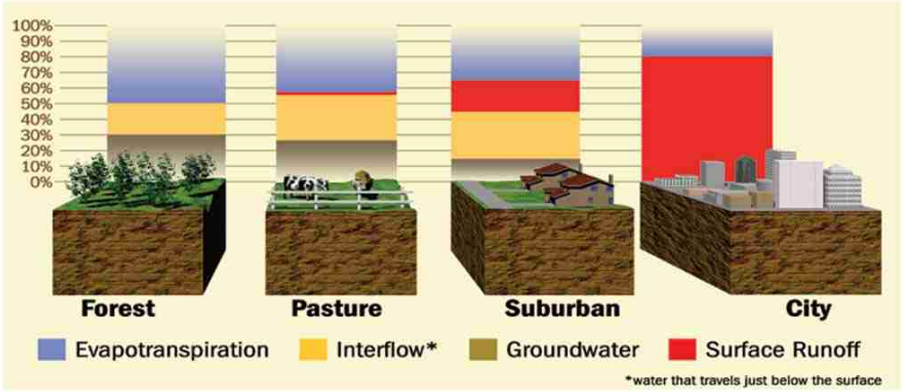
Growing Recognition of the Benefits of Healthy Soil

The "*Soils for Salmon*" initiative, begun by the Washington Organic Recycling Council (WORC) in March 1999, has become recognized both regionally and nationally as a practical approach to link the benefits of healthy functioning soils with clean, healthy water resources. The Pacific Northwest is engaged in significant debate and action around saving salmon, whose decline is an indicator of degraded aquatic resources. A widely supported direction for the protection of salmon and other species is the adoption of "Low Impact Development" practices, in order to restore more natural stream flows and protect water quality. The important function that soil quality plays in water issues had not been adequately recognized prior to the *Soils for Salmon* initiative.

Many local government and industry initiatives are underway in Washington and Oregon. A soil quality movement has developed, resulting in many successful projects using soil best practices. *Widespread recognition of the environmental functions of soils, and adoption of soil "best management practices" (BMPs) will have multiple benefits, including expanding recycling of organic waste and reducing irrigation water demand, as well as managing stormwater quantity and quality. For builders and homeowners the benefits include easier planting and better plant survival, as well as lower maintenance requirements for water, fertilizer, pesticides.*

What happens to rainwater as we develop land?

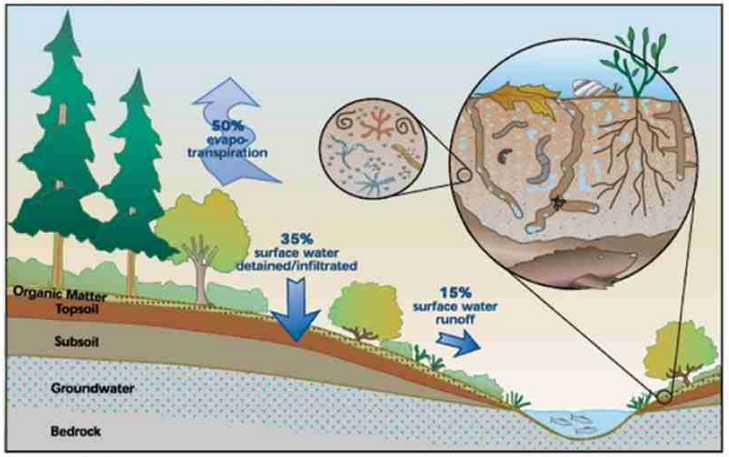
Surface runoff increases, impacting water quality. The soil is not performing its functions.



Washington Organic Recycling Council *www.compostwashington.org*

What is the value of native soil?

Numerous environmental functions:



Native Soil

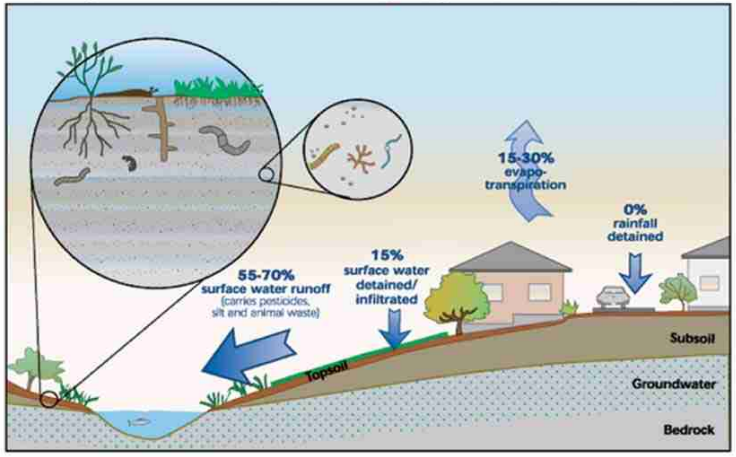
A healthy, vigorous soil and vegetation structure provides valuable plant nutrients, holds and retains water and oxygen, and binds and breaks down pollutants.

Characteristics of healthy soils:

- *Many air and water spaces*
- *Numerous micro and macro organisms*
- *Deep plant root growth*
- *High evapotranspiration, surface water infiltration, and stormwater detention*
- *Low water runoff, minimal erosion*

What is the human impact on soils?

Development limits soils' ability to provide environmental functions:



Disturbed Soil

A soil structure impacted by human activity, compaction and development, has limited organic life. This soil cannot perform its natural functions, resulting in negative impacts throughout the watershed.

Characteristics of disturbed soils:

- *Few air and water pockets*
- *Limited beneficial soil organisms – more pests*
- *Shallow root growth*
- *Low evapotranspiration; low surface water detention and infiltration*
- *High runoff and erosion*

Weir

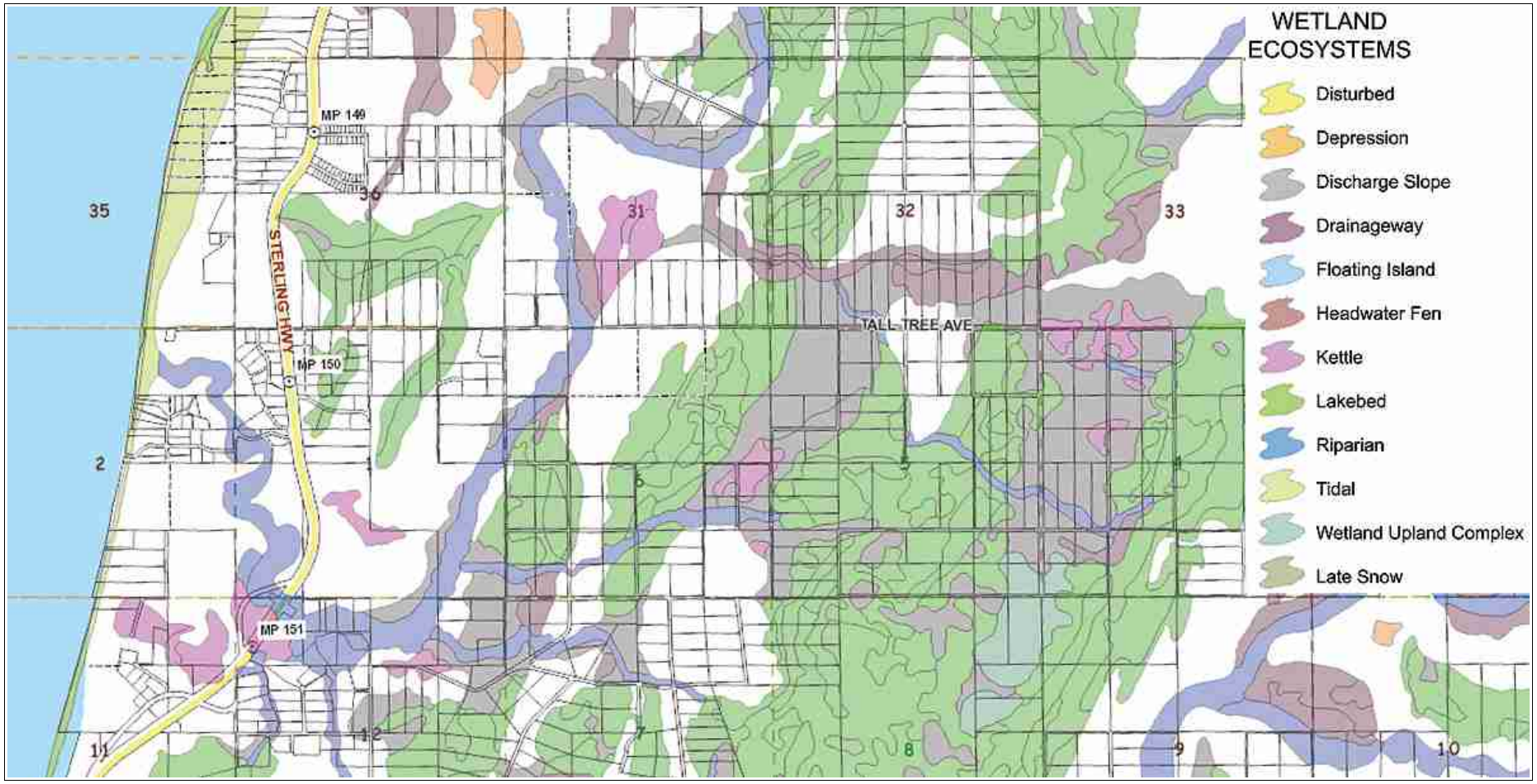
A weir is a fence or enclosure of stakes set in a stream as a trap for fish. The top right photo shows coho salmon passing through the Anchor River weir on their way upstream to spawn. The photos below show two views of the same weir, which is located just upstream of the Old Sterling Highway bridge at Anchor Point.

In 2003, the Alaska Department of Fish and Game began estimating the number of king (chinook) salmon entering the Anchor River by using a sonar system called DIDSON (Dual-frequency IDentification Sonar) during high water levels in May and early June. The sonar site was chosen because it was located above the fishery (approximately 2 miles from the river's mouth) and still in a single channel, below where the Anchor River channel splits into north and south forks. Netting upstream of the sonar site allowed biologists to determine the composition of fish species that passed the sonar site and to measure, sex, and collect scales to determine the age of individual king salmon. The project was expanded in 2004 by installing a weir in mid-June when water levels were relatively low and by continuing to count fish through the silver salmon run. Weirs are a better method to identify, count, and sample fish when there are multiple species of fish in the river, which is the case in the Anchor River as the season progresses.

Using the sonar and weir, ADF&G can monitor king salmon escapement during the fishing season and adjust regulations as needed to allow more fish to spawn. Once ADF&G has 14 years—or two life cycles—of Anchor River king salmon escapement counts, it will be better able to estimate the maximum number of fish needed to spawn to perpetuate the run at the highest level. Then the fishery could be liberalized if king salmon counts look like they will exceed the maximum needed. The sustainable escapement goal range is currently 3,800 to 10,000 king salmon.

For more information on Anchor River fish counts, go to http://www.adfg.alaska.gov/sf/FishCounts/ and select Anchor River from the dropdown list.

Wetland maps



Map showing wetlands associated with Stariski Creek near its mouth.

(Note, mapped wetlands may or may not be "jurisdictional," that is, subject to wetland permit requirements; a wetland determination or delineation would indicate whether or not a mapped wetland area is jurisdictional.)

Maps like this can be downloaded from the Kenai Peninsula Borough's GIS interactive parcel viewer (http://mapserver.borough.kenai.ak.us/kpbmapviewer/). For step-by-step instructions on how to find and identify your wetlands, go to http://www.homerswcd.org/projects/wetlands.php and select *Factsheet 2*: How to look at wetland maps online, and what we're adding to those maps.

Draft index to topics in landowner's guide watershedipedia (for Anchor River & Stariski Creek watersheds)

97. Habitat
98. Habitat fragmentation (*See also Connectivity*)
99. Headwaters
100. Headwater streams
101. Homer Soil and Water Conservation District (HSWCD)
102. HSWCD (*See Homer Soil and Water Conservation District*)
103. Humpy (*See Salmon species and life cycles*)
104. Hydrograph (*See also Discharge*)
105. Hydrology

106. Ice dams
107. Ice jams
108. Impervious surface or cover (*See also Water cycle*)
109. Infiltration (*See also Water cycle*)
110. Interactive parcel viewer (*See Kenai Peninsula Borough GIS*)
111. Interception (of precipitation) (*See also Water cycle*)
112. Invasive plants
113. Invertebrates

114. Jurisdictional wetlands (*See Wetlands*)

115. Kachemak Bay Research Reserve (KBRR)
116. Kachemak Heritage Land Trust (KHLT)
117. KBRR (*See Kachemak Bay Research Reserve*)
118. Kenai Area Plan (for state lands)
119. Kenai Peninsula Borough Comprehensive Plan
120. Kenai Peninsula Borough GIS (Geographic Information System)
121. Kenai Peninsula Fish Habitat Partnership (KPFHP)
122. Kenai Wetland Who's Who directory
123. Kenai Watershed Forum (KWF)
124. Kenai Watershed Forum atlas
125. Kettle (wetland ecosystem)
126. KHLT (*See Kachemak Heritage Land Trust*)
127. King salmon (*See Salmon species and life cycles*)
128. KWF (*See Kenai Watershed Forum*)

129. Lakebed (wetland ecosystem)
130. Landforms
131. Landscaping for salmon
132. Land Trust (*See Kachemak Heritage Land Trust*)
133. Land uses
134. Large woody debris
135. Leach field
136. Longshore current
137. Lower Kenai Peninsula Watershed Health Project
138. Low Impact Development (LID)

139. Macroinvertebrates
140. Main stem (of a river) (*See also River channel*)
141. Map (and aerial photo) scale
142. Marine derived nutrients (MDN)
143. Marsh
144. Meander
145. Meander zone
146. Measurements and conversions
147. Meltwater (*See also Water cycle*)
148. Minimum mapping unit
149. Moraine (*See Landforms*)
150. Muskeg

151. Natural Resources Conservation Service (NRCS)
152. Natural variability
153. Nonpoint source pollution
154. National Pollutant Discharge Elimination System (NPDES)
155. NRCS (*See Natural Resources Conservation Service*)

156. Oil and gas
157. 100-year flood
158. *On the Coast* (online reference covering the Kenai Peninsula)
159. *On the River* (online reference covering the Kenai Peninsula)
160. Ordinary high water (OHW)

161. Parr
162. Partners for Fish and Wildlife Program
163. Peat and peatland (wetland ecosystem)
164. Permits
165. Pink salmon (*See Salmon species and life cycles*)
166. Pipe-stream
167. Plants
168. Precipitation (*See also Water cycle*)
169. Programs for private landowners

170. Raingardens
171. Recharge
172. Recycling
173. Redd
174. Reed canary grass
175. Relict glacial drainageway (wetland ecosystem)
176. Resource management system (RMS)
177. Riparian
178. River Center (*See Gilman River Center*)
179. River channel
180. Runoff (*See Surface runoff*)

181. Salmon fry
182. Salmon habitat
183. Salmon safe certification
184. Salmon-safe residential development certification
185. Salmon species and life cycles
186. Salmon stewardship
187. Salmon stream monitoring program
188. Salmon watcher program
189. Sand (*See also Soils*)
190. Scale (*see also Map and aerial photo scale*)
191. Sea level and sea level rise
192. Section line easement
193. Sediment and sedimentation (*See also Soils*)
194. Seismic Probability Zone
195. Septic system
196. Setback (*See also Buffer*)
197. Silt (*See also Soils*)
198. Siltation (*See Sediment and sedimentation*)
199. Silver salmon (*See Salmon species and life cycles*)
200. Slope (including ways to describe)
201. Smolt
202. Soil (including soil triangle)
203. Soil best management practices for salmon (*See Soils for salmon*)
204. Soil bioengineering
205. Soils for salmon
206. Soil Survey of Western Kenai Peninsula Area, Alaska
207. Sonar counts
208. Spruce bark beetle

209. Stabilize streambanks (*See Streambank rehabilitation, stabilization^)*
210. Stariski Creek
211. Stariski Creek watershed
212. Steelhead
213. Stewardship
214. Stormwater Pollution Prevention Plan (SWPPP)
215. Stormwater runoff
216. Streambank stabilization and rehabilitation
217. Streamflow
218. Stream level (stage)
219. Stream load
220. Stream temperature
221. Streamwatch Program
222. Subwatershed (*See Watershed*)
223. Surface runoff (*See also Water cycle*)
224. Thalweg
225. Thermal refugia (*See also Stream temperature*)
226. Till (*See Glacial till*)
227. Tsunami
228. Turbidity
229. Undercutting (of streambanks)
230. Volcanic ash
231. volcano
232. Wake wash
233. Water cycle
234. Water quality
235. Water rights
236. Watershed (*See also Anchor River watershed, Stariski Creek watershed*)
237. Watershed Action Plans
238. Water table (*See also Water cycle*)
239. Weed free certification
240. Weir
241. Wetlands
242. Wetland classification and mapping
243. Wetland delineation
244. Wetland determination
245. Wetland maps
246. Wetland permit