

Conservation Values Criteria

DATASET	Source	Scoring Format	Scoring Details	Methods and Notes
Conservation Management Status (PADUS - Protected Area Dataset)	USGS	proportional	<ul style="list-style-type: none"> • 3 67-100% of shed area (Cat 1 or Cat 2 in PADUS) • 2 34-66% of shed area (Cat 1 or Cat 2 in PADUS) • 1 1-33% of shed area (Cat 1 or Cat 2 in PADUS) 	PADUS - Protected Area Dataset - GAP Status category 1 and 2 lands added together and then divided by total HUC12 area for percent of watershed managed for conservation. PADUS is a statewide coverage of areas managed primarily for conservation: national parks, national wildlife refuges, wilderness areas, state game refuges, state parks Source: USGS Link
Instream Flow Reservation	ADF&G, UAA-ACCS, with ADNR data support	binary	<ul style="list-style-type: none"> • 3 one or more Instream Flow Reservations (IFRs) in watershed (granted or applied) • 0 no Instream Flow Reservations (IFRs) in watershed 	ADF&G maintains a dataset for Instream Flow Reservations (updated in 2017), using an Excel file sent by ADF&G's, UAA added another 60 IFRs to the spatial dataset. The ADNR Land Administration System (LAS) provided an authoritative means to check the IFRs extent and status
Population Density (surrogate for Drinking Water Sources)	US Census Bureau	proportional, relative	Population Density calculated for each sub-watershed then grouped according to Natural Breaks data classification <ul style="list-style-type: none"> • 3 population density is 351-2800 people per square mile • 2 population density is 51-350 people per square mile • 1 population density is 1-50 people per square mile 	Intersected census blocks with HUC12s, then allocated population according to a block's proportion within each HUC12. If a census block was entirely contained within the watershed then 100% of the block's population was added to the watershed's population total. If half of a block was contained within the HUC then 50% of its population was adding to the watershed's total. These data were normalized by dividing the total population of a HUC12 by its area in square miles to create population density. Source: Census Link

*note: the following terms: sub-watershed, watershed, shed, and HUC all used interchangeably to reference US Geologic Survey's twelve-digit Hydrologic Unit Code or HUC12 which is the common geographic unit of measure used throughout this analysis.

Conservation Values Criteria (continued)

DATASET	Source	Scoring Format	Scoring Details	Methods and Notes
Salmon Habitat Anadromous Waters Catalog (AWC)	ADF&G	binary	<ul style="list-style-type: none"> • 3 one or more AWC waters in watershed • 0 no AWC waters in watershed 	<p>Intersected known anadromous fish bearing waters as represented by ADF&G's AWC datasets for flowing waters and lakes and ponds with HUC12 sub-watersheds</p> <p>Source: AWC Link</p>
Salmon Spawning Anadromous Waters Catalog (AWC)	ADF&G	binary	<ul style="list-style-type: none"> • 3 one or more AWC waters with spawning life stage attribute in watershed • 0 no AWC waters with spawning life stage attribute in watershed 	<p>ADF&G's Anadromous Waters Catalog includes fish life stage information. Subset of the AWC limited to spawning life stage features was intersected with HUC12 sub-watersheds</p> <p>Source: AWC Link</p>
Wild and Scenic Rivers	BLM / NPS	binary	<ul style="list-style-type: none"> • 3 one or more federally designated Wild and Scenic Rivers in watershed • 0 no federally designated Wild and Scenic Rivers in watershed 	<p>Intersected federally designated Wild and Scenic Rivers with HUC12 sub-watersheds</p> <p>Source: Wild & Scenic Rivers</p>

Watershed Stress Criteria

DATASET	Source	Scoring Format	Scoring Details	Methods and Notes
Contaminated Sites	ADEC	proportional, relative	<ul style="list-style-type: none"> • 3 cumulative total of contaminated sites weighted by status is between 301-834 • 2 cumulative total of contaminated sites weighted by status is between 31-300 • 1 cumulative total of contaminated sites weighted by status is between 1-30 	<p>Sites were given numeric values according to ADEC's site status attribute: Active sites were coded as a value of 3 while all other sites (Institutional Controls, Cleanup Complete, and Informational) were coded as 1's. Sites values were summed by sub-watershed. A shed with three Active sites and one Cleanup Complete site would have a cumulative score (3x3 + 1x1 = 10) of ten. The cumulative contaminated sites scores were grouped into three categories using the Natural Breaks data classification to proportion the sub-watersheds. Source: ADEC CS Link</p>
Discharge Permits	ADEC	proportional, relative	<ul style="list-style-type: none"> • 3 cumulative total of discharge permit values between 41-122 • 2 cumulative total of discharge permit values between 11-40 • 1 cumulative total of discharge permit values between 1-10 	<p>ADEC staff provided a table of permitted water discharges (source ADEC and USEPA) which had been assigned scores of 3,2, or 1 in descending order of size or concern.</p> <p>These discharge values were summed by HUC12 and grouped into three categories using the Natural Breaks data classification to proportion the sub-watersheds.</p>
Fish Passage Culverts	ADF&G	proportional, relative	<ul style="list-style-type: none"> • 3 cumulative total of fish passage values between 41-165 • 2 cumulative total of discharge permit values between 13-40 • 1 cumulative total of discharge permit values between 1-12 	<p>Converted ADF&G's Fish Passage RGG classification into a numeric scale: RGG Rating: 1 = Green, 2=Gray or Black, 3=Red</p> <p>Summed culvert rating scores by HUC12. A shed with three Red culverts and one Green culvert would have a cumulative score (3x3 + 1x1 = 10) of ten. Fish Passage summaries were grouped into three categories using the Natural Breaks data classification to proportion the sub-watersheds. Source: Fish Passage Link</p>

Watershed Stress Criteria (continued)

DATASET	Source	Scoring Format	Scoring Details	Methods and Notes
Impaired Waters	ADEC	binary	<ul style="list-style-type: none"> • 3 one or more Impaired waters in watershed • 0 no Impaired waters in watershed 	Intersected HUC12 sub-watersheds with Impaired Waters as represented by ADEC list of Category 4 or 5 waters defined by 2016 Alaska Biennial Integrated Water Quality Report for lakes and ponds, flowing waters, marine waters, and beaches.
Large Planned Projects	ADNR, BLM, USACE	binary	<ul style="list-style-type: none"> • 3 planned project infrastructure footprint in watershed • 0 no planned project infrastructure footprint watershed 	Assembled a composite dataset of large, planned landscape scale industrial projects across Alaska: Ambler Mine Road to Resources, Donlin Mine, and Pebble Mine. Dataset includes best available spatial data representing project infrastructure including: roads, mine pits, pipelines, and ports.
Mining Claims, Current	ADNR, BLM	proportional	<ul style="list-style-type: none"> • 3 cumulative mining claims area: 16,001 – 38,000 acres • 2 cumulative mining claims area: 4,001 – 16,000 acres • 1 cumulative mining claims area: 1 – 4,000 acres 	<p>Merged current state (ADNR) and federal (BLM) mining claims into a single dataset and intersected with HUC12 sub-watersheds.</p> <p>Mining claims areas were grouped into three categories using the Natural Breaks data classification to proportion the sub-watersheds.</p> <p>Sources: Federal - BLM Link State - ADNR Link</p>
Mining, Historic Footprint	UAA-ACCS	binary	<ul style="list-style-type: none"> • 3 one or more historic mining footprints in watershed • 0 no historic mining footprints delineated in watershed 	UAA’s Alaska Center for Conservation Science mapped historic mining footprints by digitizing the visible ground disturbance related to mining using current imagery. The footprint dataset was intersected with the HUC12s. Source: Mining Footprint Link

Watershed Stress Criteria (continued)

DATASET	Source	Scoring Format	Scoring Details	Methods and Notes
Mining, Historic Density	USGS	proportional, relative	<ul style="list-style-type: none"> • 3 cumulative total of known historic mines 17 - 37 • 2 cumulative total of known historic mines 5 - 16 • 1 cumulative total of known historic mines 1 - 4 	<p>Due to the limitations of the historic mining footprint dataset resulting from: poor imagery obscuring the site, revegetated site, or underground mines with unknown potential impacts such as offsite drainage; an additional historic mining data source is included. The USGS Alaska Resource Data File (ARDF) which has point locations for over 1600 historic mine sites.</p> <p>The historic mine locations were intersected with the sub-watersheds and then summed by HUC12 and grouped into three categories using the Natural Breaks data classification to proportion the sub-watersheds. Source: USGS ARDF Historic Mines Link</p>
Population Density (surrogate for Drinking Water Sources)	US Census Bureau	proportional, relative	<p>Population Density calculated for each sub-watershed then grouped according to Natural Breaks data classification</p> <ul style="list-style-type: none"> • 3 population density is 351-2800 people per square mile • 2 population density is 51-350 people per square mile • 1 population density is 1-50 people per square mile 	<p>Intersected census blocks with HUC12s, then allocated population according to a block's proportion within each HUC12. If a census block was entirely contained with the watershed then 100% of the block's population was added to the watershed's population total. If half of a block was contained within the HUC then 50% of its population was adding to the watershed's total.</p> <p>These data were normalized by dividing the total population of a HUC12 by its area in square miles to create population density. Source: Census Link</p>

Watershed Stress Criteria (continued)

DATASET	Source	Scoring Format	Scoring Details	Methods and Notes
Stream Road Crossings	ADOT&PF, USGS	proportional, relative	<ul style="list-style-type: none"> • 3 total of stream road crossings within sub-watershed 51 – 104 • 2 total of stream road crossings within sub-watershed 16 – 50 • 1 total of stream road crossings within sub-watershed 1 - 15 	<p>Intersected current stream network from USGS National Hydrographic Dataset (NHD) with Alaska Department of Transportation and Public Facilities most current roads database to create stream road crossings and then summed total number of crossings per HUC12.</p> <p>Grouped HUC12s into three categories using the Natural Breaks data classification to proportion the sub-watersheds.</p>
Water Quality Monitoring	ADEC	binary	<ul style="list-style-type: none"> • 3 sub-watershed does not have AKMAP water quality monitoring data • 0 sub-watershed does have AKMAP water quality monitoring data 	<p>Water quality monitoring sites from ADEC's Alaska Monitoring & Assessment Program (AKMAP). With an aim to gathering more baseline data across Alaska, HUC12s with monitoring sites are scored with zero (0) and HUC12s without monitoring are scored three (3).</p> <p>Source: ADEC Water Quality Link</p>