

Alaska Clean Water Actions (ACWA) Process

Alaska Departments of Environmental Conservation; Fish and Game; and
Natural Resources

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Introduction and Overview

Alaska has more water in the form of lakes, streams, rivers, coastline and wetlands than any other state in the union. Three state agencies are involved in assuring our waters are clean, healthy and available for various uses. The Alaska Clean Water Actions (ACWA) program brings the State resource agencies, the Department of Environmental Conservation (DEC), Department of Natural Resources (DNR) and Department of Fish and Game (DF&G) together to deal with our waters in a coordinated and cooperative method, assuring state resources are used on our highest priorities.

The three state resource agencies convene a Water Experts Group (WEG) that focuses state and federal resources on addressing issues that impact water quality, aquatic habitat, and water quantity for the waters with the greatest need. The cooperating agencies developed a waterbody nomination and ranking process that relies on established criteria to prioritize waterbodies for assessment, stewardship, and corrective action. The process addresses waters affected by the presence or risk of pollution, aquatic habitat degradation, and/or water quantity and flow problems.

ACWA Process

The ACWA process is conducted in three phases: nomination, data analysis, and action. The phases may be interwoven and can occur concurrently. The ACWA decision tree summarizing the steps is shown in Figure 1.

A. ACWA Nomination Phase

Nominations

Given the size of Alaska and the number of waterbodies, identifying key waterbodies and prioritizing actions is especially important. The public, stakeholder groups, or government agencies may nominate a waterbody. Events that may trigger a nomination include a public complaint, a permit compliance action, a newspaper report, or conclusions from a water quality report or assessment.

The nomination is reviewed by one or more members of the ACWA WEG. The reviewer(s) determine if the basic minimum information is provided.

Criteria: Mandatory fields in the Nomination Form identified with double asterisks ** (Figure 2).

- If information is missing, the nomination is held while additional information is requested from the nominator.

- If all of the basic minimum information is provided by completion of mandatory fields in the nomination form, then the waterbody is entered into the ACWA database. From here the waterbody will enter the Analysis Phase.

B. ACWA Data Analysis

Sufficient and Credible Data Review

Each nominated waterbody is analyzed using established criteria to assess the adequacy and credibility of the associated data available for the waterbody. This step is called a “sufficient and credible data review.” If information and data are insufficient or not credible, but met the basic thresholds identified in the nomination stage, the nominated waterbody is moved to the Data Collection track.

Criteria: Contained in the three Sufficient and Credible Data Support Tables (Table 3). Criteria to determine whether the data provided are adequate to conduct an evaluation are contained in the Sufficient and Credible Data Support Tables for:

- 1) Water Quantity
- 2) Water Quality
- 3) Aquatic Habitat

Track for Future Actions

One or more members of the ACWA WEG evaluates each nominated ACWA waterbody and places it in one of four tracks for future actions based on the following evaluation:

- 1) Is there sufficient and credible data to support an evaluation?
 - a) NO - If the data is not “sufficient and credible” the nominated waterbody will be placed in the **Data Collection and Monitoring Track** and ranked for prioritization.
 - b) YES - If the data is “sufficient and credible” the nominated waterbody will continue to the next step in the evaluation.
- 2) Are stewardship programs adequate to maintain and protect a waterbody?

Criteria: Contained in Statutes, regulations, standards, BMPs etc.

- a) NO - If the existing stewardship programs are NOT adequate, the nominated waterbody will continue to the next step in the evaluation.

- b) YES - If the existing stewardship programs ARE adequate, the nominated waterbody will be placed in the **Adequately Protected Waterbody Track**.
- 3) Are additional recovery actions required?
- a) NO - If there are not additional recovery actions required, the nominated waterbody will be placed in the **Protect and Maintain Waterbodies at Risk Track**.
 - b) YES - If there are additional recovery actions required, the nominated waterbody will be placed in the **Waterbody Recovery Track**

Data Collection and Monitoring Track: Insufficient information (does not meet “sufficient and credible” criteria) to evaluate waterbody condition.

Adequately Protected Waterbody Track: Sufficient information to make evaluation and has existing stewardship programs in place to maintain and protect the waterbody.

Protect and Maintain Waterbody at Risk Track: Sufficient information to make evaluation, does NOT have existing adequate stewardship programs in place, but does NOT require additional recovery actions.

Waterbody Recovery Track: Sufficient information to make evaluation, does NOT have existing adequate stewardship programs in place and requires additional recovery actions.

Priority Ranking

Following the initial waterbody evaluation and track placement, an ACWA nominated waterbody is ranked to prioritize for taking action using the ACWA Waterbody Ranking Tables (Table 4). Initial ranking should take place within six months of receiving a complete nomination application.

Each WEG representative evaluates the priority for their area of statutory authority and expertise. DNR hydrologists provide water quantity ranking, DFG biologists provide aquatic habitat ranking, and DEC provides water quality rankings.

The priority ranking is related to the requirements of the CWA, such as an exceedance of water quality standards, a compliance action associated with wastewater discharge permit, or impairment status under CWA Section 303(d) through a total maximum daily load (TMDL) or other waterbody recovery plan.

The ACWA Ranking Criteria consist of three tables, see Table 4. Each table represents one of three components for each evaluated waterbody, including:

1. Aquatic Habitat
2. Water Quality
3. Water Quantity

Each ranking component includes 6 parameters:

1. Allocation
2. Condition
3. Protection
4. Future Use
5. Present Use
6. Value

The ranking criteria were designed to be simply applied, broadly measurable and uniquely applicable to all three components. Each parameter is assigned a Score (1, 3 or 5) based upon the Rating assigned. A brief “Description of the Rating” is provided to help define the means for measuring the factor and assigning either a high, medium or low rating. Additionally, the “Considerations” column provides a brief statement of the types of information useful in determining the rating for each factor under consideration.

Professional agency staff review available information and data related to a given waterbody and assign a parameter rating based upon available data and their best professional judgement for each factor. The agency most knowledgeable and familiar with the data will likely be responsible for an individual component. For instance, the Department of Natural Resource hydrologists are assigned the responsibility for assigning factor ratings for Water Quantity, whereas biologists within the Department of Fish & Game are assigned the responsibility for making Aquatic Habitat factor ratings. The Department of Environmental Conservation is assigned the responsibility for assigning Water Quality ratings.

Each ACWA nominated waterbody is ranked as high, medium, or lower priority for each type of evaluation – water quantity, aquatic habitat, and water quality– using standardized scoring of key factors for each type of evaluation. If an ACWA nominated waterbody is ranked as high priority for any of the three evaluation areas, then it is considered a high priority ACWA waterbody.

The component receiving the highest score is the score that is used to determine whether the waterbody is a high priority. Individual component scores are not added together, nor are they averaged. All waterbodies are scored in a similar fashion until each waterbody is assigned a “final ranking score.” Waterbodies are assigned a high, medium or low priority, based upon a threshold set by a rank percentile analysis (Table 1).

Medium and high priority ACWA waterbodies are re-evaluated every 3-5 years or whenever new information becomes available. Re-evaluation may result in changes to either waterbody track or priority level.

Waterbodies in the Data Collection and Monitoring, Protect and Maintain Waterbody at Risk and Waterbody Recovery tracks are prioritized for actions. Waterbodies in the Adequately Protected Track are maintained by existing stewardship programs.

Table 1. Ranking scores for high, medium and low priorities.

	High	Medium	Low
DEC and DNR	≥ 15	10-14	< 10
DF&G	≥ 20	15-19	< 15

Table 2. Example Case for Application of Ranking Criteria.

Parameter	Ranking	Comments	Ranker	Date
Water Quality				
Allocation	3	Runs through urban area, assumed allocations.		
Condition	3	Continuous temperature data shows exceedances of Alaska water quality criteria for temperature during summer months.		
Protection	3	Exceedances of the Alaska water quality criteria for temperature have been documented, but the source is not identified.		
Future Use	3	There are two discharge permits and one pending.		
Present Use	5	There are two active discharge permits.		
Value	5	The vast majority of the watershed is a designated "Critical Habitat Area." There are two state campgrounds that provide public water to users.		
TOTAL	22			
Water Quantity				
Allocation	3	Moderate allocation.		

Condition	3	Moderately impacted.
Protection	1	Adequate protection currently in place.
Future Use	1	No anticipated future use.
Present Use	3	Some temporary water use authorizations.
Value	5	Public water supply.
TOTAL	16	
Habitat		
Allocation	5	Natural hydrology has been changed by flood control project. Parts of the lower river have been dredged.
Condition	3	The river is channelized due to habitat alterations. A connected gravel pit is a sediment concern. Stream banks and riparian vegetation have been degraded by users.
Protection	3	Protections in place, but may not be adequate.
Future Use	3	Some threats to habitat.
Present Use	5	Salmon and steelhead fishery.
Value	5	Popular sport fishery.
TOTAL	24	

C. ACWA Actions

High Priority Waterbody Actions

On an annual basis, the ACWA WEG reviews and identifies waters that are considered high priority and what actions are needed for those waters. Waterbodies in the Data Collection and Monitoring, Protect and Maintain Waterbody at Risk and Waterbody Recovery tracks are addressed during the action phase. Actions include recovery, protection and/or data collection needs for each high priority waterbody. The annual review allows for reassessment of needed actions based on new information, including the results of previous ACWA projects. New information that becomes available may lead to placing the waterbody in a different track.

Stewardship Actions

DEC also identifies stewardship actions to address particular types of pollution sources or activities that may put waters at risk of pollution. Stewardship actions may address statewide problems. Similarly, the other ACWA agencies may propose stewardship actions for aquatic habitat or water quantity problems. A stewardship project may relate to a specific waterbody (even if it is not identified as an ACWA water), a watershed, or a broader regional or even statewide area. For example, a stewardship project can assist a local government in developing and adopting land use ordinances to prevent nonpoint source pollution, particularly storm water runoff.

Figure 1. ACWA Decision Tree

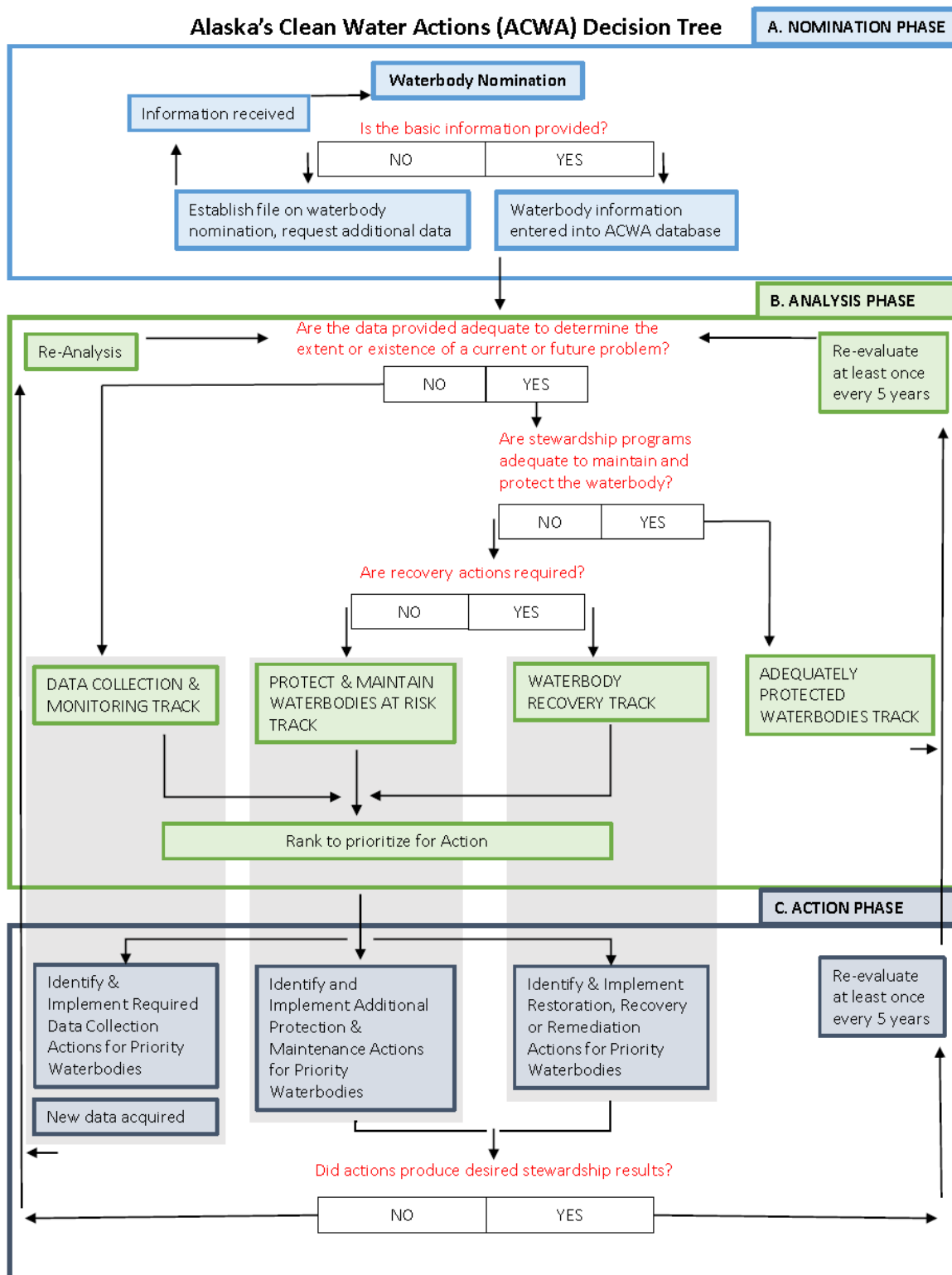


Figure 2. ACWA Nomination Form

Alaska Clean Water Actions

WATERBODY NOMINATION FORM

Note: A waterbody name, address information, pollutant type and source is needed for a successful submittal. Address information will be handled under Department policies. All submittals will be followed up with a contact to verify information.

Please be as specific as possible and fill out to the best of your knowledge. Thank you for your time and participation.

NAME OF WATERBODY: _____

Location :			
Latitude:			
Longitude:			
Hydrologic Unit Code:			
Is the waterbody in a national or state park, monument, refuge, preserve, or similar area?		<input type="checkbox"/> YES	<input type="checkbox"/> No
Name of park, monument, refuge, preserve or similar (if applicable):			

Waterbody Type:	Waterbody Size:	Segment of Waterbody Addressed:
<input type="checkbox"/> River/Stream	_____ Miles	From: _____
<input type="checkbox"/> Lake	_____ Acres/Hectares	To: _____
<input type="checkbox"/> Fresh Wetland	_____ Acres/Hectares	Other Description: _____
<input type="checkbox"/> Tidal Wetland	_____ Acres/Hectares	
<input type="checkbox"/> Estuary	_____ Square Miles	Size of Segment: _____
<input type="checkbox"/> Coastal Shoreline	_____ Miles	
<input type="checkbox"/> Groundwater	<input type="checkbox"/> Unknown	

WATER QUALITY

Are any of the following activities or resources impacted?			
<input type="checkbox"/> Drinking Water			
<input type="checkbox"/> Water Recreation			
<input type="checkbox"/> Aquatic Resources/Fisheries and Wildlife			
Period of Assessment	From:		To:
Date and time when any observations were made:			

TYPE OF POLLUTANTS:

<input type="checkbox"/> Cause Unknown	<input type="checkbox"/> Petroleum Hydrocarbons oils, and grease
<input type="checkbox"/> Organics	<input type="checkbox"/> Radioactivity
<input type="checkbox"/> Metals	<input type="checkbox"/> Residues
<input type="checkbox"/> Pesticides:	<input type="checkbox"/> Temperature
<input type="checkbox"/> Nutrients	<input type="checkbox"/> Toxics and deleterious substances
<input type="checkbox"/> pH	<input type="checkbox"/> Turbidity
<input type="checkbox"/> Sediment	<input type="checkbox"/> Noxious aquatic plants
<input type="checkbox"/> Pathogens/bacteria	<input type="checkbox"/> Other
<input type="checkbox"/> Dissolved gas	Other, describe:
<input type="checkbox"/> Dissolved inorganic substances	

SOURCES OF POLLUTANTS: Please mark any that apply

<u>Point Sources</u>	<u>Waste Disposal:</u>
<input type="checkbox"/> Industrial	<input type="checkbox"/> Sludge
<input type="checkbox"/> Municipal	<input type="checkbox"/> Wastewater
<input type="checkbox"/> Storm sewers	<input type="checkbox"/> Landfills
<input type="checkbox"/> Municipal sewers	<input type="checkbox"/> Industrial land treatment
	<input type="checkbox"/> Onsite wastewater systems
<u>Agriculture:</u>	<input type="checkbox"/> Hazardous waste
<input type="checkbox"/> Non-irrigated crop production	<input type="checkbox"/> Sewage disposal
<input type="checkbox"/> Irrigated crop production	

<input type="checkbox"/> Specialty crop production	<u>Hydrologic Modification:</u>
<input type="checkbox"/> Pasture land	<input type="checkbox"/> Stream channelization
<input type="checkbox"/> Range land	<input type="checkbox"/> Dredging
<input type="checkbox"/> Feedlots	<input type="checkbox"/> Dam construction
<input type="checkbox"/> Aquaculture	<input type="checkbox"/> Flow modification
<input type="checkbox"/> Animal waste/holding areas	<input type="checkbox"/> Bridge construction
<input type="checkbox"/> Manure lagoons	<input type="checkbox"/> Removal of riparian vegetation
<u>Silviculture</u>	<input type="checkbox"/> Streambank modification
<input type="checkbox"/> Timber harvest	<input type="checkbox"/> Draining/filling of wetlands
<input type="checkbox"/> Stream restoration projects	
<input type="checkbox"/> Forest management	<u>Urban Runoff:</u>
<input type="checkbox"/> Road construction/maintenance	<input type="checkbox"/> Surface runoff
<input type="checkbox"/> Elimination of stream thermal cover	<input type="checkbox"/> Impervious surfaces
	<input type="checkbox"/> Storm sewers
<u>Construction:</u>	
<input type="checkbox"/> Highway/road	<u>Other:</u>
<input type="checkbox"/> Bridge construction/repair	<input type="checkbox"/> Atmospheric deposition
<input type="checkbox"/> Land development	<input type="checkbox"/> Waste storage tank leaks
	<input type="checkbox"/> Highway maintenance/runoff
<u>Resource Exploration or Extraction:</u>	<input type="checkbox"/> Petroleum/chemical spills, leaks
<input type="checkbox"/> Surface mining	<input type="checkbox"/> Natural sources
<input type="checkbox"/> Subsurface mining	<input type="checkbox"/> Recreational activities
<input type="checkbox"/> Placer mining	<input type="checkbox"/> Upstream impoundment
<input type="checkbox"/> Dredge mining	<input type="checkbox"/> Salt storage sites
<input type="checkbox"/> Petroleum activities	<input type="checkbox"/> Fire damage/restoration
<input type="checkbox"/> Mill tailings	<input type="checkbox"/> Underground storage tanks
<input type="checkbox"/> Mine tailings	<input type="checkbox"/> Aboveground storage tanks
<input type="checkbox"/> Gravel mining	<input type="checkbox"/> Saltwater intrusion
<input type="checkbox"/> Injection wells	<input type="checkbox"/> Road salting
	<input type="checkbox"/> Fish, shellfish wastes
	<input type="checkbox"/> Unknown source

Please describe the source, nature and extent of pollution, and note any documentation that would support the description and other comments:

Type of Documentation: Please provide one or more of the following types of documentation (attach if possible, email or mail USPS):

<input type="checkbox"/> Water quality data	<input type="checkbox"/> Field notes
<input type="checkbox"/> Biological monitoring	<input type="checkbox"/> Aerial images
<input type="checkbox"/> Pathogen monitoring	<input type="checkbox"/> Video
<input type="checkbox"/> Documented oil spill	<input type="checkbox"/> Observation
<input type="checkbox"/> Toxicity testing	<input type="checkbox"/> Photos with documentation
<input type="checkbox"/> Habitat Assessments	<input type="checkbox"/> Photos without documentation
<input type="checkbox"/> Written report	<input type="checkbox"/> Other
<input type="checkbox"/> Notice of violation / Enforcement action, confirmed waterborne illness outbreak	
<input type="checkbox"/> Notice of violation or other enforcement action	
Describe:	
<input type="checkbox"/> Reports, studies, documents, etc. that would support this assessment,	
Describe:	

WATER QUANTITY

Period of Assessment, From:	To:
Date and Time when any observations were made:	Date: Time:
<input type="checkbox"/> Surface waterbody withdrawal for consumptive use	
<input type="checkbox"/> Ground water withdrawal for consumptive use	
<input type="checkbox"/> Man-made diversion	
<input type="checkbox"/> Man-made impoundment	
<input type="checkbox"/> Other	
Explain:	

Excessive Water due to:

<input type="checkbox"/> Man-made diversion
<input type="checkbox"/> Man-made impoundment
<input type="checkbox"/> Flooding caused by human activities
<input type="checkbox"/> Other
Explain:

AQUATIC HABITAT

Period of Assessment,	From:	To:
Date and Time when any observations were made:		
Type of Documentation (one or more required, attach if possible or email or mail USPS):		
<input type="checkbox"/> Water quantity data		
<input type="checkbox"/> Field notes		
<input type="checkbox"/> Boat wakes		
<input type="checkbox"/> Observation		
<input type="checkbox"/> Overflight		
<input type="checkbox"/> Video		
<input type="checkbox"/> Photos with documentation		
<input type="checkbox"/> Photos without documentation		
<input type="checkbox"/> Habitat Assessments		
<input type="checkbox"/> Written report		
<input type="checkbox"/> Other		
<input type="checkbox"/> Reports, studies, documents, etc. that would support this assessment		
Describe:		

Activity causing aquatic habitat degradation

<input type="checkbox"/> ATV usage
<input type="checkbox"/> Bank trampling
<input type="checkbox"/> Boat wakes

<input type="checkbox"/> Forestry
<input type="checkbox"/> Land development
<input type="checkbox"/> Road construction
<input type="checkbox"/> Unrestricted camping
<input type="checkbox"/> Insufficient stream structure
<input type="checkbox"/> Filling and draining
<input type="checkbox"/> Exotic\Invasive species

Table 3. Sufficient and Credible Data Support Tables

Category Water Quality						
Level of Confidence in Data Value	Data Content		Data Coverage		Data Quality	
	Parameter	Description	Parameter	Description	Parameter	Description
0	Assessment	No basis established.	Spatial	No data available.	QA/QC	No QA/QC available.
	Land Use	No land use information or maps provided. Man induced impacts not identified.	Temporal	No information available.	Protocols	No protocols available or identified.
	Reference Condition	No monitoring parameters or data provided and no reference condition established.			Relevance	Assertions lack any documentation and are irrelevant.
	Source	No source acknowledged or evidence to even suggest a source.				
	Photographs	None.				
1	Assessment	Based solely on observation or perception of a problem.	Spatial	Limited or no data at critical locations.	QA/QC	Noted and/or described. Data quality is suspect or unknown.
	Land Use	General land use information provided, but no maps available.	Temporal	Based on sporadic or singular observations. Period of record is incomplete.	Protocols	Incomplete or no protocols noted and/or described. Protocols not followed. Detection limits are too high. Samples not properly preserved.

	Reference Condition	Monitoring parameters are limited for problem definition. No comparison to a reference condition.			Relevance	No observation date or >5 years old. The ambient conditions provided are marginally relevant to the water quality problem described.
	Source	No evidence of man induced impacts identified. Source is extrapolated from upstream or downstream condition.				
	Photographs	One photograph provided, but fails to demonstrate the relevant water quality issue.				
2	Assessment	Simple assessment. Source, nature, and extent of water quality problem is described. Sample data is based on grab or composite water quality samples.	Spatial	Moderate spatial coverage, relative to size of waterbody. Coverage does not adequately target probable impairments (e.g., one location). Limited data with no exceedances of standards, however sediments indicate contamination and probable sources of contaminants are located in the watershed.	QA/QC	Data quality and sensitivity is low to moderate. Toxicity test replication is low. No contamination evident from QC. Low detection limits.
	Land Use	General information and maps are provided but are not specific to water quality problem described.	Temporal	Moderate temporal coverage; data collected at critical periods; may include quarterly sampling; short periods of record must include good spatial coverage.	Protocols	Data collected following appropriate protocols; training of individuals was limited.

	Reference Condition	Reference condition can be approximated by professional based upon information provided. Limited chemical parameters. May include: historical fish contaminate levels, screening model results, acute or chronic testing, sediment contamination data or source water assessment map.			Relevance	Information used to base assessment not recently collected (>5 years old) but useful to give a historical perspective for approximating reference condition or trends.
	Source	Indirect evidence that problem is due to man induced impacts. Probable impairment causes are targeted and probable sources of impairment documented.				
	Photographs	Several photographs of water quality problem are provided.				
3	Assessment	Intermediate assessment. Source, nature, and extent of water quality problem are substantially described. Sample data is based on series of grab or composite water quality samples.	Spatial	Broad spatial coverage with sufficient frequency to capture acute events.	QA/QC	Data has moderate precision and sensitivity, moderate replication used in toxicity tests; QC documents no significant sampling or analytical errors.
	Land Use	Detailed information and maps are provided and are specific to water quality problem described, but lack direct link to a source or the identified problem.	Temporal	Broad temporal coverage with sufficient frequency to capture acute events; monthly sampling during key periods; lengthy period of record (sampled over period of months for >2 years.)	Protocols	Professional scientist provides training; the sampler is well trained. A qualified professional collects the samples. Data analyzed in competent (certified) laboratory that uses methods with low detection levels.

	Reference Condition	Reference condition can be determined with a reasonable degree of confidence and used as a basis for assessment. Combination of two or more reinforcing analyses, using: water column, sediment, chlorophyll, toxicity testing, or bioaccumulation data. IF drinking water, total & dissolved metals measured; organic compounds measured.			Relevance	Data are older than five years, but there are no indications that the condition it reflects have changed significantly.
	Source	Direct evidence that problem is due to man induced impacts. Impairment causes are targeted and sources of impairment documented. Width/depth integrated sampling employed. Models calibrated.				
	Photographs	Numerous photographs of water quality problem are provided that include documentation of time, ambient conditions and camera settings.				
4	Assessment	Detailed assessment of water quality problem provided.	Spatial	Assessment based on multiple sample sites adequate for statistical analysis to assess differences.	QA/QC	High level of precision and sensitivity. High replication for toxicity tests.
	Land Use	Information and/or maps provided are relevant and sufficient to document water quality problem.	Temporal	Assessment based on data collected over multiple time frames for a period > 3 years, with sufficient frequency and parameter coverage to capture acute events, chronic conditions and other potential impacts.	Protocols	Data collected and analyzed by qualified professionals following detailed QA/QC protocols.

	Reference Condition	Abundant quantitative data on reference conditions are provided. Three or more quantitative analyses support assessment including: water column chemistry, sediment chemistry, chlorophyll, bioaccumulation data or toxicity testing. If drinking water, total & dissolved metals measured; organic compounds measured; sampling and analysis includes sediments.			Relevance	Quantitative data is current, generally less than five years old, and there is no doubt that the assessment reflects current conditions. There have not been any significant changes in activities occurring in the watershed since the data were collected.
	Source	Substantial information that problem is due to man induced impacts is provided.				
	Photographs	Comprehensive photos documenting extent of water quality problem are provided.				

Category - Water Quantity						
Level of Confidence in Data	Data Content		Data Coverage		Data Quality	
	Parameter	Description	Parameter	Description	Parameter	Description
0	Assessment	No basis established.	Spatial	No data available.	QA/QC	No QA/QC noted and/or described.
	Land and Water Uses	No information or maps provided.	Temporal	No information available.	Protocols	No protocols noted and/or described.

	Reference Condition	No data to make comparison and no reference condition identified.			Relevance	No observation date provided or not relevant to water quantity problem described.
	Source	No source acknowledged or evidence to even suggest a source for the				
	Photographs	None.				
1	Assessment	Based solely on observation or perception of a problem.	Spatial	Based on observation taken at a single site or limited access point.	QA/QC	QA/QC data provided indicating poor overall data quality.
	Land Use	General land use information provided, but no maps available.	Temporal	Based on sporadic or singular observation.	Protocols	Based upon visual observation alone.
	Reference Condition	No comparison to a reference condition.			Relevance	No observation date or 5 yrs old and only marginally relevant to the water quantity problem described.
	Source	No man induced impacts identified.				
	Photographs	One photograph provided, but fails to demonstrate the relevant water quantity issue.				
2	Assessment	Simple assessment. Source, nature, and extent of water quantity problem are described. No quantitative data provided.	Spatial	Based on one repetitive visited site.	QA/QC	Very little QA/QC information pertaining to assessment is provided.
	Land Use	General information and maps are provided but are not specific to water quantity problem described.	Temporal	Assessment based on annual visit non-specific to season.	Protocols	Simple assessment protocols are identified.

	Reference Condition	Descriptive information on reference condition is provided but no quantitative data.			Relevance	Information used to base assessment on not recently collected but useful to give a historical perspective for approximating reference condition or trends.
	Source	Indirect evidence that problem is due to man induced impacts.				
	Photographs	Several photographs of water quantity problem are provided.				
3	Assessment	Assessment of water quantity problem with a few quantitative measurements.	Spatial	Assessment based on more than one sample site.	QA/QC	Quantitative data submitted with a moderated amount of QA/QC information
	Land Use	Information and/or maps provided are relevant but not sufficient to document water quantity problem.	Temporal	Assessment based on data collected over a single time frame.	Protocols	Quantitative data collected with standardized protocols.
	Reference Condition	Sparse quantitative data on reference condition.			Relevance	Information use to base assessment on is recent. Useful for approximating reference conditions or identifying trends.
	Source	Some evidence that problem is due to man induced impacts is provided.				
	Photographs	Many photographs documenting water quantity problem are provided.				

4	Assessment	Detailed assessment of water quantity problem provided. Multiple quantitative measurements support assessment.	Spatial	Assessment based on multiple sample sites adequate for statistical analysis.	QA/QC	Quantitative data submitted with a large amount of QA/QC information and highly acceptable data quality indications.
	Land Use	Information and/or maps provided are relevant and sufficient to document water quantity problem.	Temporal	Assessment based on data collected over multiple time frames.	Protocols	Quantitative data collected with standardized protocols.
	Reference Condition	Abundant quantitative data on reference conditions are provided.			Relevance	Quantitative data is current. There is no doubt that the assessment reflects current conditions.
	Source	Substantial information that problem is due to man induced impacts is provided.				
	Photographs	Comprehensive photos documenting extent of water quantity problem are provided.				

Category - Habitat						
Level of Confidence in Data	Data Content		Data Coverage		Data Quality	
	Parameter	Description	Parameter	Description	Parameter	Description
0	Assessment	No basis established.	Spatial	No data available.	QA/QC	No QA/QC. Data quality is indeterminate.

	Land and Water Uses	No documentation.	Temporal	No documentation. Period of record is unknown.	Protocols	No data collected or unknown protocols.
	Reference Condition	No monitoring parameters or data provided and no reference condition established.			Relevance	No data provided and assertions are irrelevant and lack documentation.
	Source	No source acknowledged or evidence even to suggest a source.				
	Photographs	None.				
1	Assessment	Visual observations of habitat characteristics were made with no true assessment. No direct documentation of current or historical use by individual species.	Spatial Temporal	Assessments are only made at limited access points such as road crossings, or other types of accessible areas, or by aerial flyover.	QA/QC	Incomplete QA/QC noted and/or described. Data quality is suspect.
	Land and Water Uses	Only has documentation of land and water use practices that might alter habitat	Temporal	Based on sporadic or singular observations. Period of record is incomplete.	Protocols	Data were not collected by trained individuals following appropriate protocols.
	Reference Condition	No attempt to compare to reference condition; observed impacts are likely to be natural.			Relevance	Data are not relevant; habitat has likely changed significantly since the assessment was made.
	Source	No evidence of man induced impacts identified. Source is extrapolated from upstream or downstream condition.				
	Photographs	One photograph provided, but fails to demonstrate the relevant habitat issue.				

2	Assessment	<p>Visual observations of habitat characteristics were made with simple assessment.</p> <p>Direct visual observation of evidence of use by individual fish and wildlife species (e.g. spawning adults; tracks, bones, wildlife migration, nesting, animal scat).</p> <p>Anecdotal historical information of use by species.</p>	Spatial	Limited spatial coverage. Site specific studies.	QA/QC	Data precision and sensitivity are low.
	Land and Water Use	Use of land use and topographic maps, other reports to characterize watershed condition; probable sources of impairment are documented.	Temporal	Limited to annual visit and nonspecific to season.	Protocols	Qualified professional involved only through correspondence. Data were collected following appropriate protocols; however, individuals had limited training.
	Reference Condition	Reference condition can be approximated by a qualified professional			Relevance	Data can be used to give an historical perspective for approximating reference condition or trends. It is unlikely that the habitat has changed significantly since the assessment was made.
	Source	<p>Indirect evidence that problem is due to man induced impacts.</p> <p>Probable impairment causes are targeted and probable sources of impairment documented.</p>				
	Photographs	Several photographs of current channel, watershed, lake condition, waterbody are provided.				

3	Assessment	Use of visual- based habitat assessment following standard SOPs (e.g., Stream Reach Assessment and PFC.) Assessment includes quantitative measurements of selected parameters. Species use documented by limited sampling.	Spatial	An attempt was made to access the stream reach, lake, or other type of waterbody wherever possible. Assessment is broad; often covering the entire stream reach or targeted portion of waterbody	QA/QC	Data has moderate precision and sensitivity.
	Land and Water Use	Data on land and water uses are used to supplement assessment	Temporal	Assessment during a single season the norm.	Protocols	Professional biologist performs survey or provides training. Professional biologist or hydrologist performs the assessment.
	Reference Condition	Reference condition can be determined with a reasonable degree of confidence and used as a basis for assessment.			Relevance	Data were collected recently or are very unlikely that the habitat has changed significantly since the assessment was made.
	Source	Direct evidence that problem is due to man induced impacts.				
	Photographs	Photographs of channel, watershed, lake, or other waterbody condition prior to alteration and current conditions are provided.				

4	Assessment	Assessment of habitat based on quantitative measurements of instream parameters, channel morphology and floodplain characteristics, preferably under standardized and commonly used protocols. Designed quantitative sampling using established protocols.	Spatial	Assessment based on good access of the entire stream reach including private property. Helicopter surveys, etc.	QA/QC	High level of precision and sensitivity.
	Land and Water Use	Information and/or maps provided are relevant and sufficient to document habitat quality.	Temporal	Data from multiple years.	Protocols	Assessment was performed by a highly experienced professional.
	Reference Condition	Reference condition is well understood and is used as the basis of the assessment.			Relevance	Data are current; there is no doubt that the assessment reflects current conditions and documents past conditions.
	Source	Direct evidence that problem is due to man induced impacts.				
	Photographs	Comprehensive historical photographs of channel, watershed, lake, and waterbody condition prior to alteration and current conditions are provided, including specific dates, ambient conditions and full descriptive documentation. Groundtruthing.				

Table 4. ACWA Waterbody Ranking Tables

Water Quality

Water name		Hydrologic Unit		Staff scoring	Date Scored	
Allocation	Points	Rating	Description of Rating	Considerations	Comments	Score
	1	Low	Few or no water quality allocations (e.g, no discharge permits or water quality certifications for other permits issued).	Review permits or authorizations issued or pending.		
	3	Moderate	Some water quality allocations (e.g., a few minor discharge permits or certifications for minor projects issued).			
5	High	Many water quality allocations (e.g., many or major discharge permits or certifications issued).				
Condition	1	Compliant	Water quality is in compliance with applicable standards.	Review available data and reports in relation to federal, state or local water quality regulations and ordinances.		
	3	Impaired (Low duration or severity)	Water quality does not comply with applicable standards for short periods of time or at low levels of severity.			
	5	Impaired (High duration or severity)	Water quality does not comply with applicable standards for extended periods of time or at high levels of severity.			
Protection	1	Adequate protection	Protections currently in place are adequate to prevent degradation of water quality.	Assess effectiveness of existing stewardship programs, on-going water quality condition of waterbody and associated risks.		
	3	Moderate protection	Protections currently in place may not be adequate to prevent degradation of water quality.			
	5	Inadequate protection	Protections currently in place are not adequate to prevent degradation of water quality.			
Future use	1	Few (> 5 Years)	Few or no future water uses with potential to affect water quality. No discharge permits or water quality certifications for other permits issued or pending. No unauthorized activities that degrade water quality are documented.	Assess potential for increased uses, allocations and impacts.		
	3	Some (1-5 Years)	Some future water uses with potential to affect water quality. Few or minor discharge permits or certifications issued or pending. Few or no unauthorized activities degrading water quality are documented.			
	5	High (0-1 Year)	Multiple or major future water uses with potential to affect water quality. Multiple or major discharge permits or certifications issued or pending. Unauthorized activities degrading water quality are documented.			

Water name		Hydrologic Unit		Staff scoring	Date Scored	
Present use	Points	Rating	Description of Rating	Considerations	Comments	Score
	1	Low use	Few beneficial uses are associated with water quality (e.g., not a drinking water source, no fish and wildlife production).	Assess current use of waterbody relative to maximum potential uses and pollution impacts.		
	3	Moderate use	Some beneficial uses associated with water quality (e.g., fish and wildlife production, secondary drinking water source).			
5	High use	Many or major beneficial uses associated with water quality (e.g., primary drinking water source for large population, salmon spawning and rearing).				
Value	1	Low Value	Private drinking water supply, no uniquely distinctive pristine qualities, administratively assigned designation or none.	Assess relative value of waterbody as a water source or supply for potential uses and any special designations.		
	3	Moderate Value	Class C drinking water supply, moderately distinctive pristine qualities or assigned a regulatory designation.			
	5	High Value	Class A/B drinking water supply, uniquely pristine qualities or legislatively assigned designation.			
					TOTAL	0

Water Quantity

Water name		Hydrologic Unit		Staff scoring	Date Scored	
Allocation	Points	Rating	Description of Rating	Considerations	Comments	
	1	None	No allocation of water in the watershed	Examine water right files, volumes and locations.		
	3	Moderate	Volume of water allocated is small compared to amount of available water.	Examine types of use: consumptive vs. non-consumptive.		
Condition	5	Near Maximum	Volume of water allocated is large compared to amount of available water.			
	1	Not impacted	Capable of providing for appropriated uses	Examine effects of appropriated uses on available water. Examine flow data, lake level data, static water level data.		
	3	Moderately impacted	Sometimes is not capable of providing for appropriated uses.			
Protection	5	Severely impacted	Not capable of providing for appropriated uses.			
	1	Adequate protection	Protection currently in place are adequate to maintain sufficient water volumes for existing appropriations.	Examine water use records, monitoring data associated with temporary water use authorizations, compliance with permit conditions.		
	3	Moderate protection	Protections currently in place may not be adequate to maintain sufficient water volumes for existing appropriations.			
Future use	5	Inadequate protection	Protections currently in place are not adequate to prevent degradation of water quality.			
	1	Few (> 5 Years)	No or few future water use applications are anticipated.	Examine number, types and location of pending applications for water rights, temporary water use, and instream flow reservations. Examine file of unauthorized uses.		
	3	Some (1-5 Years)	Some future water use applications are anticipated.			
Present use	5	High (0-1 Year)	Multiple or many future water use applications are anticipated.			
	1	Few	No appropriated use of water in the watershed.	Examine number, types and location of existing water rights, temporary water use authorizations, and instream flow reservations.		
	3	Some	Some appropriated use of water in the watershed.			
Value	5	Many	Multiple or many types of appropriated use of water in the watershed.			
	1	Low Value	Not used as a public water supply.	Examine type of use in water right files.		
	3	Moderate Value	Intermittent use as a public water supply.			
	5	High Value	Continuous use as a public water supply.			
					TOTAL	0

Habitat

Water name			Hydrologic Unit	Staff scoring	Date Scored	0
	Points	Rating	Description of Rating	Considerations	Comments	Score
Allocation	1	Low	Few or no allocations involving habitat.			
	3	Moderate	Some allocations involving habitat (e.g., few or minor permits issued for habitat alteration).			
	5	High	Many allocations involving habitat (e.g., many or major permits for habitat alteration).			
Condition	1	Not Impaired	Habitat structure and functions are intact. Human influences are not important factors affecting habitat productivity, health, size, or quality.			
	3	Impaired - Low	Low duration or severity of habitat degradation. Short-term effects on habitat structure and functions affecting productivity, health, size, or quality.			
	5	Impaired - High	High duration or severity of habitat degradation. Long-term effects on habitat structure and functions resulting in low productivity, health, size, or quality.			
Protection	1	Low	Protections currently in place are adequate to prevent degradation of habitat.			
	3	Moderate	Protections currently in place may not be adequate to prevent degradation of habitat.			
	5	High	Protections currently in place are not adequate to prevent degradation of habitat.			
Future use	1	Low	Few or no threats to habitat. No permits issued or pending for habitat alteration. No unauthorized activities that degrade habitat are documented.			
	3	Moderate	Some threats to habitat. Few or minor permits issued or pending for habitat alteration. No unauthorized activities that degrade habitat are documented.			
	5	High	Multiple or major threats to habitat. Multiple or major permits issued or pending for habitat alteration. Unauthorized activities that degrade habitat are documented.			
Present use	1	Low	Few beneficial uses derived from the habitat (e.g., not important for fish and wildlife production, hunting, fishing, or other activities).			
	3	Moderate	Some beneficial uses derived from the habitat (e.g., resident fish production, low-use subsistence fishery).			
	5	High	Many or major beneficial uses of the habitat (e.g., salmon spawning and rearing, wildlife viewing, major subsistence fishery).			
Value	1	Low	The habitat is not valued for particular uses or functions. Not a unique or special habitat, the habitat type is abundant in the region.			
	3	Moderate	The habitat is valued for unique or special uses or functions that it serves. Habitat is not abundant in the area.			
	5	High	The habitat is highly valued for unique or special uses or functions that it serves. The habitat is not abundant in the area.			
					TOTAL	0

