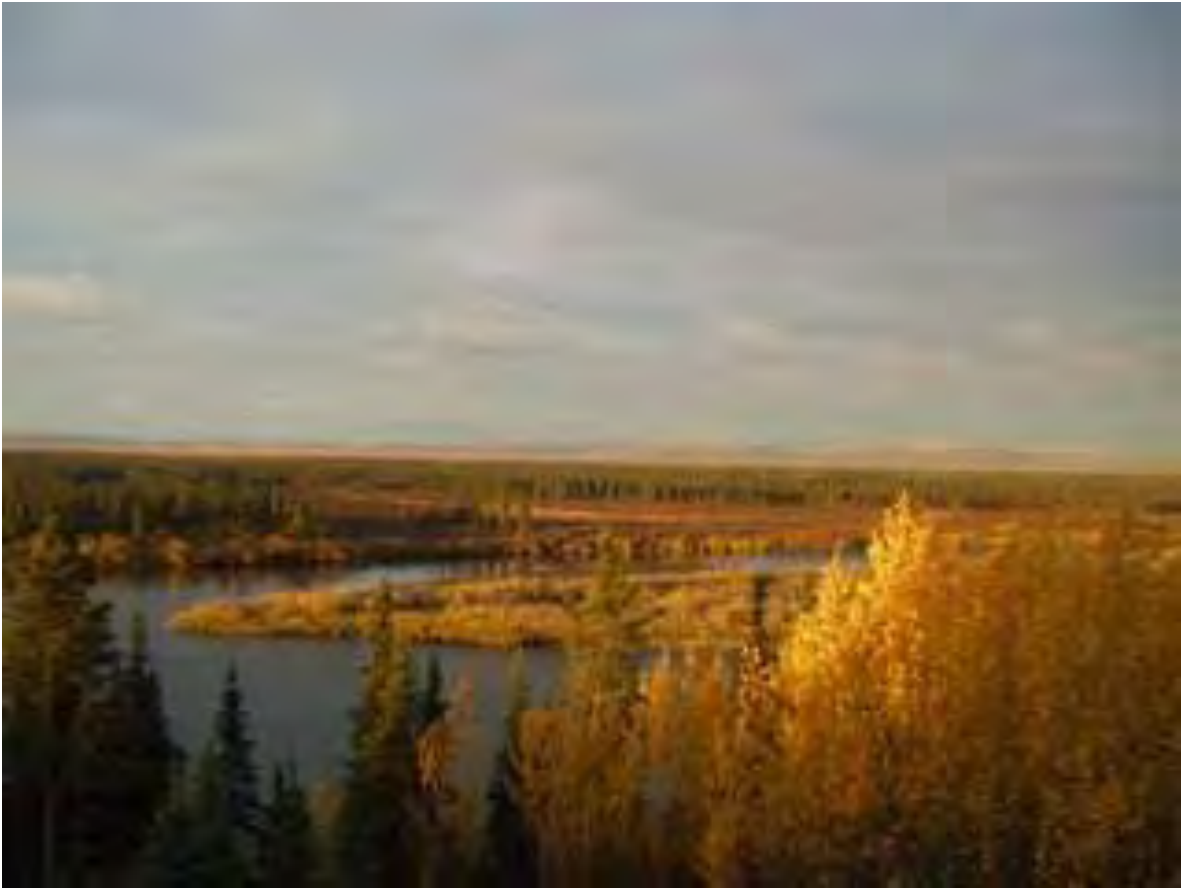


**Golovin Bay Watershed Alliance
Wetland Program Plan for Monitoring and Assessment**



Lower Fish River Valley looking Southwest

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Acronym List

ACWA – Alaska’s Clean Waters Actions

CEC – Chinik Eskimo Community

CNC – Council Native Corporation

EMAP – Alaska’s Environmental Monitoring and Assessment Program

ENRI – University of Alaska Anchorage Environmental and Natural Resources Institute

EPA – United States Environmental Protection Agency

FRWMP – Fish River Watershed Monitoring Project

GBWA – Golovin Bay Watershed Alliance

GIS – Geographic Information Systems

GNC – Golovin Native Corporation

IGAP – EPA Indian General Assistance Program

NAFWS – Native American Fish and Wildlife Service

NAWQA – USGS National Water Quality Assessment Program

NRCS – USDA Natural Resources Conservation Service

NSEDC – Norton Sound Economic Development Corporation Fisheries Research &
Development

NSHC – Norton Sound Health Corporation

NVC – Native Village of Council

NVWM - Native Village of White Mountain

QAPP – Quality Assurance Program Plan

UAF – University of Alaska Fairbanks

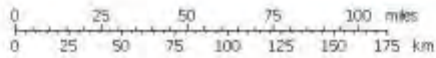
WMNC – White Mountain Native Corporation

WPDG – EPA Wetland Program Development Grant

WPP – GBWA Wetland Program Plan for Monitoring and Assessment

WQS – Water Quality Standards

TOPO! map printed on 04/16/12 from "Golovin Bay Watershed.tpo"



1.0 Monitoring Strategy

1.1 Introduction

The Golovin Bay Watershed Alliance (GBWA) is an alliance between the tribal governments and Alaska Native Claims Settlement Act village corporations from each of the three communities located within the Golovin Bay Watershed: White Mountain, Golovin, and Council. The Tribes and Corporations of each of the three communities have chosen to create a forum for the purpose of discussing watershed issues of common interest and to provide stewardship for development of the watershed. The GBWA claims no regulatory function. The mission statement of the GBWA reads: “The Golovin Bay Watershed Alliance is dedicated to the conservation of a healthy watershed by protecting, monitoring and enhancing our wetlands and waterways utilizing modern science, traditional knowledge, and education for all generations.”

With the support of and on behalf of all the founding members of the GBWA, the Native Village of White Mountain (NVWM) applied to the US Environmental Protection Agency (EPA) for a Wetlands Program Development Grant (WPDG) for the purposes of organizing the GBWA and writing a wetlands program plan for monitoring and assessment. This document is the result of the WPDG grant and the input gathered during six face-to-face meetings and two teleconference meetings which the grant funded. Attending each of the meetings and providing valuable commentary and contributions were representatives from each of the GBWA members and our invited partners: Norton Sound Economic Development Corporation Fisheries Research and Development (NSEDC), US Department of Agriculture Natural Resources Conservation Service (NRCS), University of Alaska Fairbanks (UAF), and Norton Sound Health Corporation (NSHC).

The Golovin Bay Watershed covers more than 1.6 million acres of sub-arctic wildlands. Fewer than 400 people live permanently within the watershed. The area is characterized by broad alluvial plains bordered by rolling uplands. Major drainages are thawed and support riparian boreal forest which gives way to cottonwood, willow, and tundra in upper reaches. The rest of the landscape is underlain by discontinuous permafrost that generally supports boreal forest on many south facing slopes and otherwise tundra vegetation. Wetlands predominate in lower elevations.

The Golovin Bay Watershed is perceived by the GBWA to be generally healthy and essentially pristine, but there are numerous vestiges of past mining, mostly placer mining, and other human influences. It is perceived that local people commonly take wetland health for granted. Perceived wetlands threats have been separated into two categories. **Category one threats** are those which the GBWA can reasonably influence and include:

- a) current and future mining activity,
- b) invasive species,

- c) sedimentation resulting from human activity, thawing permafrost, or a combination of the two,
- d) the proposed road to Nome,
- e) general construction projects,
- f) the breaking of the vegetative cover over permafrost by vehicles,
- g) the Niukluk crossing at Council,
- h) river bank erosion and bottom disturbance, particularly spawning bed disturbance, due to boat traffic,
- i) litter and pollution, and
- j) changes in future land ownership.

Category two threats are those which the GBWA can not reasonably influence and include:

- a) coastal flooding,
- b) erosion due to stream flooding,
- c) population increase,
- d) climate change, and
- e) permafrost melting.

The Golovin Bay Watershed Alliance Wetlands Program Plan for Monitoring and Assessment (WPP) utilizes the framework of ten plan elements laid out in the April 2006 EPA issued “Elements of a State Water Monitoring and Assessment Program for Wetlands”. Addressing each of these ten elements will help assure that WPP activities are conducted in a rational manner and that the quality of collected data is assured and available for resource stewardship. Additionally the WPP has relied upon EPA’s “Core Elements Framework” to help it identify general and specific monitoring and assessment objectives and activities. The Core Elements Framework ensures that the WPP recommended monitoring approaches are thorough and sequential.

The context of the WPP’s strategy is driven by the need to pursue objectives and engage in activities which are feasible for the members of the GBWA. The GBWA is an unfunded organization. None of the Tribes and none of the Corporations have established sophisticated environmental programs. Therefore the WPP must keep the many factors that cause the data needs for the Golovin Bay Watershed to exceed the programmatic capacity of the GBWA in mind. Because of the small body of environmental data that currently exists for the Golovin Bay Watershed from all sources, it is necessary for the WPP to start with basic monitoring and assessment activities.

Additionally, though this WPP aspires to be a peer-reviewed, scientific wetlands program, it is overarched by local traditional knowledge. The people of the GBWA have an intimate relationship with the Golovin Bay Watershed, generations of environmental memory, and evolving best practice for subsistence activities. This cumulative traditional ecological knowledge allows the WPP to make certain assertions, i.e. fish spawning beds are being covered by fine sediment in some places, with confidence. Consequently this WPP has been created using traditional knowledge as a primary guide. The WPP will continue to emphasize reliance on traditional knowledge until a preponderance of evidence has been accumulated to define the reference environmental condition of the watershed. Therefore the task of the WPP is to quantify, qualify, and classify the wetlands and waters of the Golovin Bay Watershed.

Impediments, other than a lack of programmatic capacity, to successful achievement of WPP objectives and activities include: ill-defined or unengaged GBWA member council and board leadership positions, a lack of locally available, trained environmental technicians, and insufficient funding for environmental data collection. The remote nature of the majority of the watershed and the consequent difficult access and high costs also impedes carrying out the activities of the WPP. The noticeable effects of climate change: melting permafrost causing ponds to drain and the tundra to dry out, tundra vegetation giving way to shrubs and boreal forest, and shifting weather patterns, highlight the need for establishing baseline conditions but are difficult for the GBWA to influence.

1.2 Strategy

The scope of the WPP includes all of the waters and wetlands of the Golovin Bay Watershed, considers all data needs, and covers a five-year period from 2012 through 2016. The **immediate goal** of the WPP is “negligible net loss of wetlands”, and the **long-term goal** is “no net loss of wetlands”. Minimal loss of wetlands to economic development is expected given that very little infrastructure currently exists within the watershed that can support job creation and sustainable communities. The purpose of the WPP is to direct data collection and database development so that wetland loss and water quality or quantity degradation due to desirable economic projects can be mitigated.

Sub-goals of the WPP are:

- 1) to form sustainable partnerships with outside entities that support the work of the GBWA,
- 2) to educate the public, including the local public, on watershed issues,
- 3) to conserve all the habitats within the watershed as a means to maintain healthy populations of subsistence resources,
- 4) to protect the water quality and quantity of all the waters within the watershed,
- 5) to identify all the natural resources within the watershed,
- 6) and to establish the baseline state of watershed health.

The WPP is intended to be a unifying document for the six founding members of the GBWA to independently pursue the goals and objectives of the GBWA. The GBWA retains all the options available to it for providing watershed stewardship such as funding operations from member donations, applying for grants on its own behalf, and contracting services out to partners and outside agencies. However, the WPP has been created with the intention that each GBWA member will independently engage in efforts which aim to achieve WPP objectives and will fund those efforts by independently pursuing grants or other methods of paying for the necessary work. Each GBWA member will develop its capacity to perform environmental work at its own pace and will not necessarily be dependent on other members in carrying out portions of the WPP. Primary functions of the GBWA will be to serve as a forum for members to share individual WPP progress and to serve as a clearinghouse for collected environmental data.

Forming and maintaining sustainable partnerships with watershed stakeholders and interested organizations is an important part of the WPP strategy. The GBWA is fortunate to have already established partnerships for WPP efforts. NSEDC has a vested interest in wetlands habitat health, high water quality and adequate water quantity as necessary for salmon life cycles. Therefore in addition to its own limited data collection activities within the Golovin Bay Watershed, NSEDC provides logistical, financial, and technical support to NVWM and others for WPP activities. In addition to making its significant climatic and other databases available to the GBWA, UAF is committed to providing server space, assisting with database management, establishing additional Golovin Bay Watershed weather stations, and facilitating Nome campus water quality technician training. NRCS is currently assisting the NVWM with Geographic Information Systems (GIS) software training and is providing the GBWA with existing environmental analyses based on satellite and aerial imagery. The GBWA is in discussion with NRCS about forming a Tribal Conservation District. NSHC is in the process of forming a larger Bering Strait/Norton Sound Watershed Alliance of which GBWA would be a part and from which GBWA would consequently derive support. NSHC is also facilitating water quality technician training. In addition to these partners, the GBWA will seek other partners such as the University of Alaska Anchorage Environmental and Natural Resources Institute (ENRI) and the Western Alaska Landscape Conservation Cooperative.

2.0 Monitoring and Assessment Objectives

The Golovin Bay Watershed Alliance Wetlands Program Plan for Monitoring and Assessment seeks:

- a. to develop a monitoring and assessment strategy consistent with Elements of a State Water Monitoring and Assessment Program for Wetlands;
- b. to implement a sustainable monitoring program consistent with the wetlands monitoring strategy;
- c. to incorporate monitoring data into tribal and corporate decision making;
- d. to establish the baseline wetland condition, including water quality and water quantity, for prioritized sites within the watershed in order to track trends;
- e. to conduct a generalized wetlands inventory of the entire watershed in order to track trends;
- f. to inventory all sites within the watershed contributing to stream and wetlands sedimentation, in particular human caused sedimentation, to track trends;
- g. to establish an effective data management system to support informed decision making and to track trends.

3.0 Monitoring and Assessment Design

3.1 General Approach Considerations

Monitoring and assessment conducted under this initial WPP will rely on best professional judgment to target sampling within specific waters and wetlands for purposes of comparison. Future improvements to monitoring and assessment methods will target supplemental data gathered through the use of a probability based sampling approach.

Identification of the specific wetlands classification system and the specific mapping system that this WPP will utilize is expected to be part of the wetlands inventory process. The GBWA will specify which classification system and which mapping system are to be used. In conducting this inventory and in updating the inventory, the GBWA will coordinate with and rely upon agencies and organizations involved in this type of work within our watershed including: EPA, NRCS, UAF Geographic Information Network of Alaska, State of Alaska Department of Environmental Conservation (DEC), US Fish & Wildlife Service, and Federal Geographic Data Committee.

In consideration of perceived threats to the waters and wetlands of the Golovin Bay Watershed and because of known occurrences of these threats in recent times, the following waters and associated wetlands have been identified for priority action: Ophir Creek, Ichupak River, Mckinley Creek, Kitchavik River, Chinik Creek, and Klockerblock River. The Ichupak, Kitchavik, and Klockerblock Rivers can also be used as monitoring and assessment controls since very little or no historical human disturbances have affected these waterways.

The WPP will use Alaska's statewide Water Quality Standards documented in the Alaska Administrative Code at 18 AAC 70 as the primary standard by which to compare WPP collected water quality data. Secondly, the WPP will use EPA's, Alaska Department of Environmental Conservation adopted, acute and chronic criteria for toxic and other deleterious organic and inorganic substances for both fresh and marine waters as they relate to protecting aquatic life. These criteria can also be found in the Alaska Administrative Code at 18 AAC 70.020(b).

The WPP also incorporates and recommends following Alaska's Environmental Monitoring and Assessment Program (EMAP) protocols, which have been developed by EPA, for both coastal waters and wadeable streams when appropriate for implementing elements of this plan in the Golovin Bay Watershed. EMAP protocols should be utilized when developing Quality Assurance Program Plans for new monitoring activities and when developing curriculum for water quality technician training. EMAP protocols employ probabilistic sampling which is practical and cost effective for GBWA activities. EMAP protocols are designed to provide general assessments about biotic and abiotic conditions within a study area. These assessments can then be compared to other areas of Alaska and other states because EMAP protocols are standard and used by all the states.

Because of a general lack of water quality and quantity data for most of the Golovin Bay Watershed and because of GBWA programmatic limitations, the US Geological Survey's National Water Quality Assessment Program (NAWQA) protocols may be more appropriate for implementation of some WPP activities than EMAP protocols. In practice the two sets of protocols will be integrated into all WPP activities and each situation will dictate which protocols are emphasized. This dual approach will allow the GBWA, over time, to make statistically valid inferences about the condition of watershed-wide wetlands as well as to target site-specific monitoring based on local concerns.

3.2 Recommended GBWA Monitoring Approaches

The following is a list of actions to be completed by GBWA members during the five year WPP period, 2012 to 2016. It is understood that partner involvement will be instrumental in the completion of many of these actions. In addition to this list, each GBWA member is free to pursue other actions which further the goals and objectives of this WPP.

- a) The NVWM will continue its EPA Indian General Assistance Program (IGAP) Environmental Program and continue to include its Fish River Watershed Monitoring Project (FRWMP) as a grant component. **(Timeline: Spring 2012)** The NVWM has collected four years of water quality and macroinvertebrate data according to an EPA and DEC approved Quality Assurance Program Plan (QAPP) which samples from six sites. This activity should continue for the duration of the WPP until a preponderance of evidence is accumulated. **(Timeline: Fall 2012 and ongoing)**
- b) The NVWM will apply for grants to gauge stream flow at targeted sites, and in particular the Ichupak River, because of local concern. **(Timeline: Spring 2012)** NVWM may also apply for grants to gauge streams using a probability-based sampling design. **(Timeline: Fall 2016)**
- c) The NVWM will apply for grants and work with partners to update the State of Alaska's Anadromous Waters Catalog. **(Timeline: Winter 2014)**
- d) Chinik Eskimo Community (CEC) will continue its IGAP Environmental Program and will incorporate a water quality monitoring component in its work plan **(Timeline: Winter 2013)** that ultimately leads to an EPA and DEC approved QAPP. **(Timeline: Spring 2014)** The water quality component will also include a commitment to complete water quality technician training for the key personnel responsible for implementing data collection activities. **(Timeline: Fall 2014)** CEC will include marine and estuarine sites in their sampling design. **(Timeline: Spring 2014)**
- e) The Native Village of Council (NVC) will apply to EPA for an IGAP grant. **(Timeline: Spring 2012)** That application will include a water quality monitoring component in its work plan that ultimately leads to an EPA and DEC approved QAPP. **(Timeline: Spring 2014)** The water quality component will also include a commitment to complete water quality technician training for the key personnel responsible for implementing data collection activities. **(Timeline: Fall 2014)**

- f) NVWM will include a commitment in its IGAP water quality component to complete water quality technician training for the key personnel responsible for implementing data collection activities. **(Timeline: Fall 2014)**
- g) The White Mountain Native Corporation (WMNC), the Golovin Native Corporation (GNC), and the Council Native Corporation (CNC) will provide a minimum of three scholarships for shareholders and/or their descendants to attend the complete series of water quality technician trainings which are still in development. **(Timeline: Spring 2014)**
- h) WMNC, GNC, and CNC will develop a special post-secondary scholarship category within their existing scholarship programs which provide extra incentive for shareholders to pursue environmental degrees and technical certifications. **(Timeline: Winter 2013)**
- i) WMNC, GNC, and CNC will enter into agreements with their respective tribal environmental programs to help operate each tribe's monitoring and assessment activities. **(Timeline: Winter 2016)**
- j) The GBWA will work with NRCS to explore the advantages and disadvantages of forming a Tribal Conservation District as a means to help fund GBWA operations and WPP implementation, especially completion of a watershed wetlands inventory. **(Timeline: Winter 2015)**
- k) The GBWA will assign sub-watersheds to each of the three communities for the purpose of taking an inventory of sites subject to contributing significant sedimentation to wetlands and waterways. **(Timeline: Spring 2013)** Each community's Tribe and Corporation will work together to identify at-risk sites and determine which are human influenced. **(Timeline: Spring 2014)**
- l) NVWM will function as the initial clearinghouse for data collected by GBWA members implementing this WPP. **(Timeline: Fall 2012)** NVWM will work closely with UAF to create and maintain a publicly accessible database on UAF servers. **(Timeline: Winter 2013 and ongoing)** NVWM, CEC and NVC will verify data collected under their programs, put the data in an appropriate format, and forward the data to NVWM on a quarterly basis. **(Timeline: Winter 2015)** NVWM, CEC and NVC will also verify, format, and forward data to NVWM obtained from outside sources such as mining companies or scientific projects. **(Timeline: Spring 2016)**
- m) Each of the three GBWA tribes will survey tribal members and analyze questionnaire responses on the subject of Golovin Bay Watershed traditional ecological knowledge. **(Timeline: Summer 2013)** Additionally, narrative interview comments from adults over the age of 55 on the Golovin Bay Watershed traditional knowledge subject will be compiled. **(Timeline: Winter 2015)** This data will not become part of the public database but may be shared on a case-by-case basis.

4.0 Core and Supplemental Indicators

The following set of core and supplemental indicators has been identified in a series of GBWA WPP planning meetings and is chosen to allow the GBWA to lay the basis for defining the reference environmental condition in a cost effective manner given limited programmatic capabilities. WPP core and supplemental indicators were chosen with reference to the NVWM Fish River Watershed Monitoring Project (FRWMP), the Alaska Clean Waters Actions (ACWA) initiative, the EMAP and the NAWQA. The “Table 1. Core and Supplemental Indicators” is arranged to match ACWA and EMAP indicators both of which are modeled to be consistent with EPA protocols. NAWQA indicators are presented differently by the United States Geological Survey and consequently are bent by this WPP to fit the EPA model. In addition to chemical and physical indicators, measured electronically whenever affordable, the GBWA emphasizes macroinvertebrate biological monitoring and assessment as part of each member’s monitoring efforts.

The GBWA has also chosen a set of supplemental indicators to be employed if core indicators indicate impairment or if human activity raises the need for special study of wetlands and waters of concern. No GBWA member suspects any wetlands or waters within the Golovin Bay Watershed to be impaired to the point of requiring it to be nominated as an ACWA waterbody. Therefore supplemental indicators have been chosen based upon the expectation that resource extraction and road construction are the most likely sources of impairment, if any, to Golovin Bay Watershed waters in the immediate future.

Level 1 – Landscape Assessment methods, as described in “Elements of a State Water Monitoring and Assessment Program for Wetlands”, will be used to assess general wetlands extent, distribution, condition, and type abundance in order to track trends over time. Because the Golovin Bay Watershed is essentially undeveloped, it is not anticipated that any wetlands will be characterized as other than the natural state. As Landscape Development Indices are established, they will be used in conjunction with monitoring activities for the core and supplemental indicators to target specific wetlands for field-based monitoring efforts as needed.

For the “Table 1, “Core and Supplemental Indicators”, on the next page, the letter C designates that the indicator is a core indicator for that protocol. The letter S indicates that the indicator is a supplemental indicator for that protocol. Supplemental indicators will be considered when monitoring data for the core indicators indicates a reason to collect additional data for a particular wetland or water body. A blank cell designates that the indicator is not required under that particular set of protocols.

Table 1. Core and Supplemental Indicators

Indicators	WPP		Freshwater EMAP	Coastal EMAP	ACWA	NAWQA
Water Physical and Chemical						
Dissolved Oxygen	C		C	C	C	C
Temperature	C		C	C	C	C
Turbidity	C			S	C	C
PAR/Light Transmittance	S			C	S	
Conductivity	C		C	C	C	C
pH	C		C	C	C	C
Secchi Depth				C	S	
Nutrients			C	C	S	C
Chlorophyll a			C	C	S	S
TSS & TDS	S		C		S	C
Alkalinity			C		S	C
BOD/COD					S	
Total Residual Chlorine					S	
Fecal Coliforms	S				C	
Dissolved Organic Carbon			S		S	C
Cations and Anions			S		S	C
Aqueous and Aromatic Hydrocarbons					S	
Oil and Grease/Oily Sheen	C				S	
VOCs and SEMI-VOCs					C	C
Heavy Metals	S				C	S
Cyanide	S				S	
Flow and Discharge	C		C		S	C
Uranium	S					
Sediment Physical and Chemical						
Grain Size	S			C	S	
Total Organic Carbon				C	S	
Sediment Bioassays				C	S	
Heavy Metals Analysis				C	S	
Semi-VOC Analysis				C	S	C
Biological						
Macroinvertebrate Diversity/Abundance	C		C	C	C	C
Fish Diversity/Abundance				C	S	C
Whole Effluent Toxicity			C		S	
Fish Tissue Analysis				C	S	
Habitat Assessment	S				S	C
Marine Mammal and Avian Monitoring	S				S	

C = Core S = Supplemental

5.0 Quality Assurance

The NVWM FRWMP uses a QAPP that was developed from a template produced by the Native American Fish and Wildlife Service (NAFWS; 2004). This template is available for tribal groups and other non-profit monitoring groups to use to develop their own QAPPs. The NAFWS template was reviewed and approved by both the EPA and DEC. The WPP recommends that all partners and GBWA members involved in developing water quality technician training curriculum incorporate NAFWS protocols, data quality objectives, methods, and standard operating procedures so that the NAFWS QAPP template jives seamlessly with all technical training elements. The WPP also recommends that all GBWA member monitoring and assessment activities be governed by a QAPP based on the NAFWS template. If NAFWS protocols conflict with EMAP or NAWQA protocols, the latter will be substituted unless compelling reasons dictate otherwise which will be noted in the QAPP. In creating QAPPs, GBWA members should utilize GBWA partners as technical support and review. GBWA members should obtain EPA and DEC approval for completed QAPPs in addition to any local and/or regional approval.

It is the responsibility of each GBWA member collecting data that all data submitted to the data management clearinghouse, NVWM, for inclusion in the UAF hosted database is verified for quality assurance according to its QAPP.

The partner-developed water quality technician training will standardize field methods, sample collection, data quality objectives, and data sheets for WPP monitoring activities unless special circumstances require deviating from the standard and are explained in the QAPP.

The GBWA is inexperienced with the entire process of conducting a wetlands inventory including assuring the quality of the inventory. It is the intention of the WPP that wetlands inventory activities will be general in nature and that the specific determinations needed to perform a detailed, comprehensive wetlands inventory, including quality assurance, will reveal themselves over the course of this WPP. The same is true for assuring the quality of a sedimentation site inventory. As the GBWA gains experience with identifying sedimentation sites, those which are at risk for contributing to the sedimentation of wetlands and water bodies, standards will be developed by which new sites can be included and old sites can be evaluated.

6.0 Data Management

The GBWA is committed to developing, building, and maintaining a database and data management infrastructure which:

- 1) provides for efficient storage and retrieval of wetlands, geospatial, water quality, water quantity, and bioassessment data for all of the Golovin Bay Watershed,
- 2) improves wetlands management decision making and water quality data analysis, and
- 3) improves the quality and consistency of wetlands and water quality reporting.

The NVWM will function as the clearinghouse for the GBWA database. NVWM will work with UAF to develop and build a GBWA database which will be hosted on UAF servers and be accessible to the public. As datasets are made available to NVWM by GBWA members over time, those datasets will be uploaded to the UAF hosted database. Links will be created to datasets currently within the UAF system that have relevance to the Golovin Bay Watershed. NVWM will also include publicly available datasets from any source that have relevance to the Golovin Bay Watershed in the GBWA database. NVWM will work with UAF to determine the most appropriate formats for database compatibility.

Each GBWA tribe will upload collected bioassessment data to the ENRI Alaska StreamTeam Database on an annual basis.

The NVWM will also work with NRCS and others to develop GIS applications capability for the specific purpose of managing geospatial data involving Level 1 wetland assessments. NVWM currently has ArcGIS 9.3.1 and intends to develop its capacity with this software.

For the duration of this WPP, the GBWA will not utilize EPA's STORET or Assessment Database options. The GBWA will develop its capacity with UAF before making use of national data management tools.

7.0 Data Analysis/Assessment

The GBWA will use State of Alaska Water Quality Standards (WQS) as its benchmark for assessing water quality standards attainment or impairment decisions. However traditional knowledge is clear about the general determination that all waters and wetlands in the Golovin Bay Watershed are in their natural state. Therefore the focus of WPP data analysis and assessment will not be on WQS attainment or impairment but on the extent to which the reference condition and observed data trends correlate to traditional knowledge. Until analysis shows that specific waters or wetlands are in question of being less than the natural state, assessment quality needs to be suitable for general resource planning.

Field data sheets will be standardized in the water quality technician trainings and the NAFWS QAPP template. Data analysis needs, formats, and products will be addressed in the technician trainings and included in the QAPPs. Graphic analyses of data will be created annually by each GBWA member collecting data. The GBWA will compare graphs and recommend additional analysis, continued data collection, or additional data. NVC will keep records of all graphs produced for GBWA assessment.

Graphic analyses of the traditional knowledge questionnaires will be created by each GBWA member collecting tribal data. A combined analysis for the three tribes will be created by CEC. CEC will provide secure storage for the raw data forms. Individual tribal interview comments will be combined by CEC. A narrative, based on the combined results of the traditional knowledge survey, will be created by CEC describing the consensus opinion of the condition of the Golovin Bay Watershed from a traditional perspective. Each GBWA member will be given the option to endorse the CEC narrative or submit a dissenting narrative. CEC will securely store all narratives together with the other data and analysis of the traditional knowledge survey.

Once a substantial body of WPP data is collected, it is the intention of the GBWA to correlate that data with UAF and other weather data, hydrologic gaging data, and wetlands inventory data to develop a more complete assessment of the environmental condition.

8.0 Reporting

Each GBWA member will report to its membership on the traditional knowledge surveys and data collection activities for which it is responsible at the member's annual meeting. This report will include narrative, the graphical analyses prepared for the GBWA, and interpretations of the data analysis. Peer review will be provided by NSEDC, but peer review required by a certain date must be submitted at least two months in advance and during the months of October through March.

The GBWA will report the CEC prepared report on consensus traditional knowledge to each of its members. The GBWA will also make oral presentations about water quality data analysis, the developing reference condition, and wetlands inventory assessments at local and regional public meetings. The GBWA will also contribute articles to newsletters and/or newspapers to inform the public on WPP progress..

NVWM will assure annual updating by uploading received datasets to the UAF hosted database.

The GBWA will prepare cumulative reports in years 2014 and 2016 of all collected data from all members. These reports will be interpretive, narrative, and include graphical analyses. They will also include statistical analyses if available. The reports will be disseminated to all GBWA members and partners and will address water quality assessment, wetlands inventory assessment, and sedimentation inventory analysis.

The reports will also attempt to define the reference condition and its relationship to traditional knowledge. The reports will be made available to EPA and DEC. NSEDC will provide peer review for the reports. The purpose of the reports will be to inform wetlands management decisions for GBWA members and to inform watershed planning.

The GBWA will also explore partnering with EPA and the Army Corps of Engineers to integrate wetland monitoring and assessment information with Clean Water Act Section 404/401 permit tracking systems.

9.0 Programmatic Evaluation

The GBWA will evaluate all aspects of the WPP for progress and effectiveness at its annual meeting each winter. GBWA partners will participate in this evaluation as technical advisors. During this evaluation, data analyses from the previous field season will be reviewed and changes for the coming field season will be considered. All ten elements of the WPP will be considered individually during the evaluation. The GBWA will document all findings as a result of the evaluation as an addendum to its meeting minutes and will note if wetlands monitoring and assessment information is supporting the goals and objectives of the WPP.

The GBWA is an unfunded organization at this time. However, GBWA tribes have EPA IGAP grants or will have EPA IGAP grants to fund environmental programs with a water and wetland component. IGAP has been a steady source of environmental funding for tribes for over a decade and will continue in the near future. However, should IGAP cease, GBWA corporations can be approached to fund the most critical monitoring tasks until alternate funding sources can be obtained, some GBWA partners may fund targeted data collection, and new partners and funders can be approached to fund WPP activities. The GBWA will also explore forming a Tribal Conservation District as a means to fund program activities.

Each GBWA member conducting environmental data collection activities will maintain detailed project accounts of associated costs in terms of both money and time.

Each GBWA tribal council or corporation board will assign someone to oversee implementation and progress of the WPP. The WPP will be included on the agenda of one regular meeting per quarter under reports. Each council or board will make those reports accessible to other GBWA members or provide a summary of their reports on a semi-annual basis.

10.0 General Support and Infrastructure Planning

The GBWA intends to implement the WPP strategy through its member organizations. The NVWM has an Environmental Coordinator, an Assistant Coordinator, a Watershed Coordinator, and a summer intern to implement its aspects of the WPP. CEC has an Environmental Coordinator and an Assistant Coordinator. When NVC applies for its IGAP grant, it will include wages for an Environmental Coordinator and an Assistant Coordinator at a minimum. WPP strategy assumes that these staffing levels will be the norm for the near future. WPP strategy also assumes that it will receive significant support from its current and future partners.

Future WPP planning and implementation should seek to wean itself off IGAP dependency. Consequently each environmental program should expand to employ at least two field technicians supervised by the tribe's Environmental Coordinator and dedicated to data collection activities and wetlands monitoring and assessment program maintenance. Each program should also take advantage of field season interns.

The GBWA itself should strive to assume all data management and analysis activities. This will entail at least two GBWA employees. The GBWA will require an office manager responsible for maintaining funding streams, data analysis, and reporting. A data manager will also be necessary and will be responsible for maintaining the database, retrieving requested information, and generating GIS products.

WPP Commitment Spreadsheet - May, 2011							
Commitment	NVWM	CEC	NVC	WMNC	GNC	CNC	GBWA
IGAP Environmental Program	yes	yes	apply				
water quality monitoring	yes	will include	will include				
water QAPP EPA/DEC approved	yes	will write	will write				
apply for additional grants	yes stream gage and AWC						
water technician training commitment	yes	yes	yes	scholarships	scholarships	scholarships	
post secondary scholarships				yes	yes	yes	
fund IGAP monitoring activities				yes	yes	yes	
Discuss Tribal Conservation District	yes	yes	yes	yes	yes	yes	yes
Assign sedimentation inventory watershed							yes
complete sedimentation site inventory	yes	yes	yes	yes	yes	yes	
verify, format, forward collected data quarterly	yes	yes	yes				
verify, format, forward outside source data	yes	yes	yes				
act as data clearinghouse	yes						
work with UAF on database	yes						

Commitment	NVWM	CEC	NVC	WMNC	GNC	CNC	GBWA
conduct traditional knowledge survey	yes	yes	yes				
conduct traditional knowledge interviews	yes	yes	yes				
analyze surveys and questionnaires	yes	yes	yes				
annual StreamTeam database update	yes	yes	yes				
develop GIS capability for wetlands assessments	yes						
develop wetlands inventory	yes	yes	yes	yes	yes	yes	yes
create graphical analyses of collected environmental data	yes	yes	yes				
create graphical analyses of traditional knowledge data	yes	yes	yes				
review and analyze all environmental data graphs and make recommendations							yes
catalog and store all environmental graphs and summaries			yes				
create combined analysis of traditional knowledge data		yes					
create combined interview comments		yes					
create narrative of consensus opinion from all combined traditional knowledge data		yes					

Commitment	NVWM	CEC	NVC	WMNC	GNC	CNC	GBWA
endorse/dissent traditional knowledge narrative	yes		yes				
catalog and store all traditional knowledge data, summaries, and narratives		yes					
report to membership at annual meeting on all environmental and traditional knowledge data collected and WPP progress	yes	yes	yes	yes	yes	yes	
report consensus traditional knowledge to GBWA members							yes
present at local and regional meetings							yes
contribute articles to newsletters and newspapers							yes
develop sedimentation site evaluation standards							yes
identify wetlands classification system and mapping system for GBWA use							yes
establish landscape development indicies							yes
prepare cummulative reports in 2014 and 2016 and distribute to members, partners, EPA, and DEC							yes

Commitment	NVWM	CEC	NVC	WMNC	GNC	CNC	GBWA
explore EPA and Army Corps of Engineers partnering re: CWA section 404 and 401							yes
evaluate WPP for progress and effectiveness at annual meeting							yes
document evaluation findings as addendum to annual meeting minutes							yes
maintain detailed data collection project accounts for money and time	yes	yes	yes				
assign an employee or council/board member to oversee WPP implementation and progress	yes	yes	yes	yes	yes	yes	
include WPP report on agenda of one regular meeting/quarter	yes	yes	yes	yes	yes	yes	
share reports with other members	yes	yes	yes	yes	yes	yes	
expand environmental programs	yes	yes	yes	yes	yes	yes	
assume data management activities							yes