

**The Ramsar Convention on Wetlands Resolution IX.4 Annex:  
The Ramsar Convention and  
Conservation, Production and Sustainable Use of Fisheries  
Resources**

**FishMAP: Fisheries Monitoring, Awareness and Protection  
Izembek National Wildlife Refuge, Alaska**



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**To**

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## **Executive Summary**

The Ramsar Convention on Wetlands, of which the United States is a signatory, is the first international treaty to foster conservation and sustainable use of wetlands worldwide. During the Ramsar Convention on Wetlands 9<sup>th</sup> Conference of Contracting Parties (COP9), which took place in Kampala, Uganda in 2005, a number of resolutions were passed. One of the resolutions, Resolution IX.4 “The Ramsar Convention and conservation, production and sustainable use of fisheries resources,” aims to promote the wise use of wetlands for fisheries resources. Individual Ramsar sites are responsible for incorporating fisheries management into their overall management plans. The Fisheries Monitoring, Awareness, and Protection Program (FishMAP) proposed in this report will be implemented in Alaska’s Izembek National Wildlife Refuge (NWR), the first Ramsar site in the U.S.

The program design incorporates three recommendations proposed in COP9 Resolution IX.4, namely managing wetland ecosystems (Izembek Lagoon Project); increasing awareness about the importance of wetlands (Promoting Izembek); and promoting international cooperation (Mortensens Creek Project). The program in Izembek will be implemented by the National Wildlife Refuge System and Region 7 branch of the U.S. Fish and Wildlife Service (USFWS), in partnership with organizations including the Alaska Department of Fish and Game, the University of Alaska, and the King Cove Native Association.

The following report is a summary of the FishMAP program, which outlines the organizational and staffing requirements, program budget, performance measurement and first year tasks. The main tasks of the FishMAP’s three programs (Izembek Lagoon Project, Mortensens Creek Project and Promoting Izembek Project) are eelgrass and salinity monitoring; weir monitoring of salmon and sharing data with Canadian Ramsar sites to increase international cooperation; as well as increasing signage around Izembek sites coupled with updating the FWS Izembek websites.

Finally, wetlands in the U.S. are diverse in nature, and different wetlands will benefit from different management techniques. The following program design illustrates how the Ramsar Convention on Wetlands COP9 Resolution IX.4 Annex guidelines may be applied at the Izembek site. Taking into account the specific circumstances and opportunities which the case presents we have chosen to concentrate on a select number of variables. If successful, FishMAP can be a useful model of fisheries incorporation into the overall management plans at other Ramsar sites.

## **Introduction**

The Ramsar Convention on Wetlands, of which the U.S. is a signatory, is the only international treaty that fosters conservation and sustainable use of wetlands worldwide. Resolution IX.4 Annex of the 9<sup>th</sup> Conference of Parties (COP9) addresses the importance of wetlands for fisheries, the subsequent need to manage fishery practices and the sustainable use of wetlands. In the U.S., as well as worldwide, wetlands are crucial as habitat, nurseries and food sources for fish and other aquatic species. The loss and degradation of wetlands, as well as the adoption of environmentally destructive fishery and aquaculture practices, endangers fisheries that depend on wetlands. COP9 Resolution IX.4 Annex provides recommendations that promote research, policy making, and management practices for the sustainable use of wetland fisheries. These recommendations will provide a useful framework for reviewing current national wetland management practices in the U.S.

## **Importance of Wetlands to Fisheries**

Wetlands are ecosystems that provide a range of important functions for humans, fish and wildlife. They contain high biological productivity and are important as habitats for fish and wildlife. Birds and mammals rely on wetlands for food, water, and shelter. Fish, amphibians and reptiles use them for breeding, egg deposition, and nurseries. Wetlands can also offer storm protection, and improve water quality by filtering pollutants from the water.

Fish represent the largest source of protein worldwide consumed by humans. The U.S. is the fourth largest fish exporter in the world, and the second largest importer.<sup>1</sup> Fishing is of great social, cultural and economic importance throughout the world and a vital source of food and income for millions of people.

The importance of wetland ecosystems to fish is becoming increasingly well understood. Over 70% of the United States' commercially important fish have life cycles that depend on wetlands.<sup>2</sup> In 1997, the Environmental Protection Agency estimated that \$79 billion was generated from the harvesting of fish dependent on wetland habitat.<sup>3</sup>

According to the Millennium Ecosystem Assessment (MA), fishery yields in many parts of the world are facing steep declines. Nearly half of the known ocean fisheries are completely exploited and 70% are in need of urgent management.<sup>4</sup> In the U.S., 39% of the 822 native freshwater species are at risk of extinction. The U.S. Fish and Wildlife Service cited aquatic habitat loss and alteration as the main cause of fishery declines in the U.S.<sup>5</sup> Thus, the fate of fisheries in the U.S. is tightly linked to that of wetlands.

## **Basic Principles of the Ramsar Convention**

The Ramsar Convention, established in 1971, aims at conserving wetlands as a vital natural resource on a global scale. The mission of the Ramsar Convention is "the conservation and wise use of all wetlands through local, regional and national actions and international cooperation, as a contribution towards achieving sustainable development

throughout the world.”<sup>6</sup> Currently, it is the only international agreement that addresses wetland conservation on a global scale, and involves a total of 153 countries as contracting parties. Although the Ramsar Convention is not binding, contracting parties are expected to:

- Designate wetlands of international importance
- Ensure the ecological character of designated sites
- Promote the wise use of wetlands
- Support wetland research, management and education
- Cooperate with other parties in the management of transboundary wetlands <sup>7</sup>

The Ramsar Convention operates under the principles of the Wise-Use framework, which is continually evolving through the conferences of parties. According to the Ramsar Convention, wise-use constitutes the "... sustainable utilization for the benefit of humankind in a way compatible with the maintenance of the natural properties of the ecosystem.”<sup>8</sup> This framework consists of several points of guidance for solutions including institutional and organizational agreements, knowledge concerning wetlands, and actions at particular wetland sites. These principles are the theoretical basis for participation in the Ramsar Convention. The Convention also recognizes the Three Pillars of Action, which include the wise use of wetlands, expansion of the Ramsar sites list and international cooperation.<sup>9</sup>

#### **COP9 Resolution IX.4 Annex**

Every three years the Contracting Parties hold a conference to promote policies and technical guidelines, to enhance the effectiveness of the Convention and to collaborate with other global and regional conventions on the environment. The most recent Conference of the Contracting Parties, COP9, was held in Kampala, Uganda in 2005. Adopted at COP9 was Resolution IX.4 Annex: Conservation, Production and Sustainable Use of Fisheries and Resources, which promotes the “wise use” management of wetland ecosystems for fisheries.

The resolution contains 41 guidelines. In brief, they begin by urging contracting parties to recognize the importance of wetlands to fisheries. Next, the convention encourages contracting parties to be aware that human development and introduced species, as well as environmentally destructive fishing and aquaculture practices, play a role in endangering wetlands. Finally, the guidelines acknowledge a need for better research, management and policy-making towards the protection of wetlands and fishery resources. The annex of the resolution provides 11 specific recommendations for action, which are listed in Appendix I of this report.

#### **Implications for U.S. management**

Unlike legislation, COP9 Resolution IX.4 Annex contains no binding enforcement or funding mechanisms, but rather, recommendations and guidelines for contracting parties to use when reviewing wetland management practices and policies. However, the

convention does provide information and advice on wise use and management planning for wetlands and fisheries through its conference of parties, websites and toolkits. The techniques and knowledge that the U.S. gains from Ramsar can be used to improve wetland management practices and the state of wetlands in the U.S.

In the U.S., wetland area had declined from 343,000 square miles to 162,000 square miles between 1780 and 1980, a loss of more than 50%.<sup>10</sup> In recent years, however, the total wetland acreage in the U.S. has experienced a net gain as a result of President Clinton's 1993 "no net loss" wetland protection policy and President Bush's 2004 policy to increase wetland area by 3 million acres in 5 years.<sup>11</sup> However, this recent gain in wetlands may in part be due to the broad definition of wetlands and the practice of constructing artificial "mitigated" wetlands to compensate for the loss of natural wetlands. A broad definition may count a newly created wetland as equal to an established, natural wetland, even though these mitigated wetland may not actually provide the same ecological services as natural wetland. As wetland types are diverse and the "no net loss" program allows creation of new wetlands for wetlands destroyed in development projects, it is important to make sure the wetland types that are most favorable to commercial fisheries are not lost and replaced with less beneficial types.

The Sustainable Fisheries Act is the primary legislation regarding sustainable fisheries in the U.S. This act manages fish stocks in order to keep them at a maximum sustainable yield. Ramsar sites can aid in promoting this goal by providing protection for nursery and spawning grounds, as well as providing information on the status of fisheries supported by the site through specific indicators.

Guidelines provided by COP9 Resolution IX focus on maintaining the quality of wetlands while incorporating the needs of fisheries. Thus, they may prove useful for complimenting U.S. wetland management programs, which emphasize maintaining quantity.

### **Ramsar sites in the U.S.**

As a signatory, the U.S.'s responsibilities to the Ramsar Convention on Wetlands include designating at least one wetland to the "List of Wetlands of International Important" and ensuring the ecological character by conserving the site through the wise use approach. Other responsibilities are promoting wise use of wetlands, including training in wetland research and management. Finally the U.S. is expected to consult with other Ramsar signatories over the implementation of the Convention guideline, especially for transboundry wetlands. As of 2006, there are 22 Ramsar sites in the U.S. The sites are dispersed throughout 18 states with a majority located on the coastline of the east and west coasts respectively.<sup>12</sup>

Ramsar sites are valuable to the U.S. because they expand the scope of wetland conservation to an international level. Many wetland sites cross national borders and many aquatic species, especially fish, migrate; therefore, international cooperation and protection is critical to ensure the quality of these shared resources. In addition, U.S.

membership in the Ramsar Convention shows our support of conservation and encourages others to do the same. It promotes sharing ideas and techniques regarding conservation and wise use of wetlands.

Last but not least, Ramsar sites can be testing-grounds for incorporating guidelines in the COP9 international agreement into current U.S. wetland management practices. The proposed program in this report will involve applying principles on wise use, increasing international cooperation and improving information on the status of fisheries on the Alaskan Izembek National Wildlife Refuge Ramsar site. Through the program, the site may provide insight to management of other wetlands in the U.S.

## **Implementation**

In the U.S. the Fish and Wildlife Service International Affairs Department is responsible for fulfilling the U.S.'s responsibilities as a signatory party to the Ramsar Convention. In order to designate a wetland as a Ramsar site, any local government, organization, or community can nominate a site if it meets any one of eight criteria specified in the Convention, listed in the appendix. A written agreement is needed from all landowners and a member of Congress is required to represent that state in order to continue the nomination proceedings. The U.S. Fish and Wildlife Service makes the final decision. The program in this report, however, will not cover site designation, but will focus on implementation of COP9 Resolution IX.4 Annex principles to an existing Ramsar site in Izembek, Alaska.

## **Program Design**

Our policy solutions focus specifically on COP 9 Resolution IX.4 Annex, which presents 11 different solutions stated previously to promote the conservation, production, and sustainable use of fisheries. For our program implementation, we have chosen to focus on the following three points:

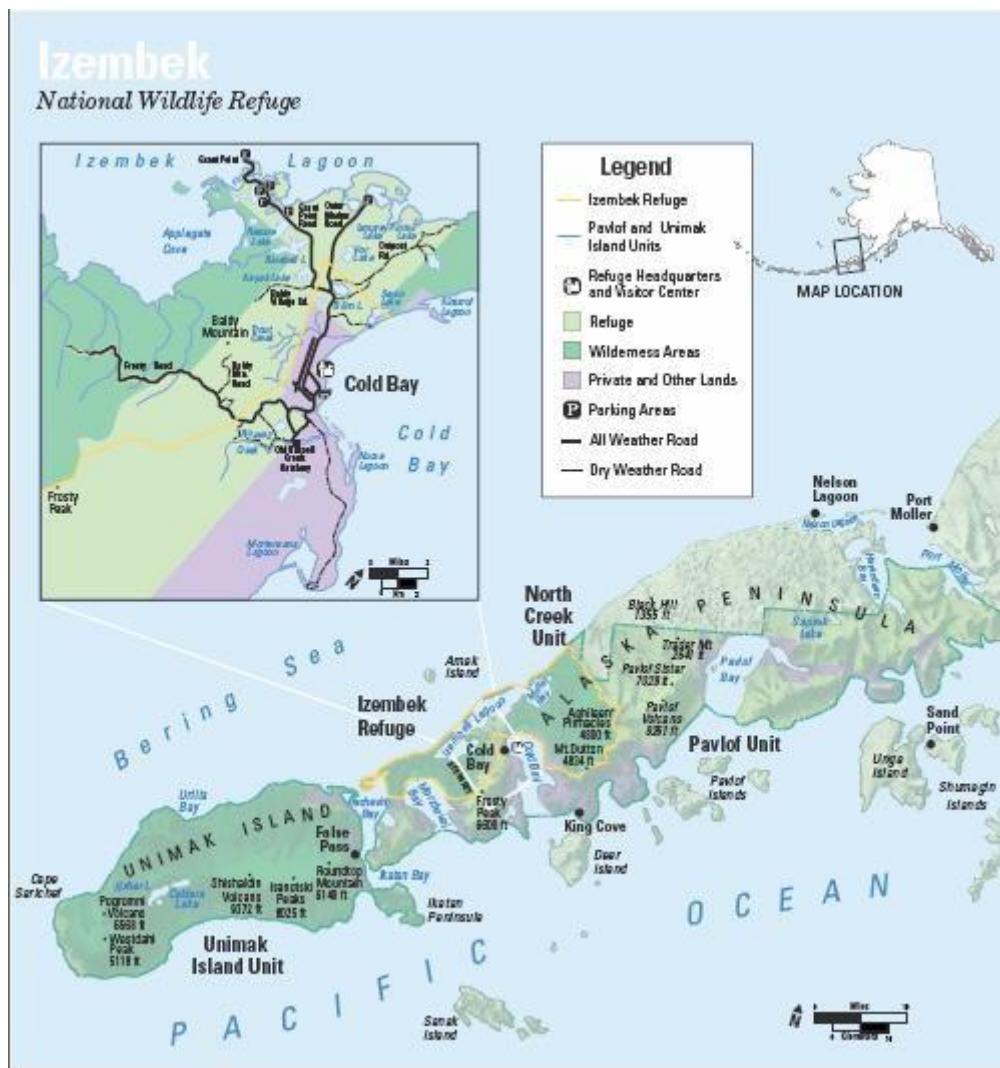
- 1) sustainable management of wetland ecosystems for fisheries, or wise use,
- 2) increased international cooperation, and
- 3) improvement to status information on fisheries in Ramsar sites.

In developing our program design priorities to address the aforementioned three proposed solutions from COP 9 IX.4 Annex, we chose to focus primarily on areas in wetland policy that differ between Ramsar and U.S. policies. To this end, we created a program design that would:

- 1) improve understanding of the basic components of a specific wetland, particularly with regards to its importance for fisheries,
- 2) utilize and improve existing systems designed to monitor the health of wetlands in areas important for fisheries, and
- 3) increase public awareness of the importance of wetlands

**Program site: Izembek, Alaska**

The decision to focus on Izembek National Wildlife Refuge (INWR) was based on a variety of reasons. Wetlands cover 60%, or over 200 million acres of Alaska, and therefore the state provides vast swathes of some of the nation’s remaining pristine wetlands. In addition fisheries are Alaska’s most valuable export resource, beating out petroleum by a wide margin. In 2004, Alaska’s commercial harvest was valued at \$1.3 million.<sup>13</sup> Izembek was also chosen for historical reasons, as it was the first Ramsar site established in the U.S. in 1996. Izembek is a wetland that provides essential nursery and other services for Alaska’s important fisheries resources. It contains the largest eelgrass bed in North America, which is necessary for habitat and food for such species as salmon, herring, pollack, and halibut.





## Program Mission, Focus, and Overview

The purpose of the Fisheries Monitoring, Awareness, and Protection Program (FishMAP) is to ensure that fisheries and fishery resources at Izembek NWR remain healthy and are used in a sustainable manner. In accordance with recommendations from the Ramsar Convention COP 9 resolution IX.4 annex FishMAP will focus on managing wetland ecosystems; increasing awareness about the importance of wetlands; and enabling international cooperation, especially between Izembek and sites in Canada which share fisheries stocks. It is important to note that Izembek was chosen with the understanding that it is a relatively pristine wetland area, and therefore, the monitoring programs being implemented under our proposed program are not intended to mitigate ongoing damage, but to rather establish a baseline of information and knowledge about a pristine wetland. By establishing such a program in a fairly pristine area, we hope to better understand how to create similar programs that may be proliferated throughout the U.S. to other less pristine Ramsar sites in order to better achieve the goals set forth by Ramsar, particularly, Resolution IX.4 Annex from COP9.

### *Managing wetland ecosystems*

Currently, there are no eelgrass and salinity monitoring projects being conducted at Izembek on an ongoing basis. In the past, weir monitoring was conducted just outside of Izembek. However, this project, which concluded that fish populations in the area were healthy, has been terminated. All of the proposed monitoring projects will be recorded in easily accessible databases so that information can be shared with other interested parties; these databases currently do not exist.

### *Enabling international cooperation*

The creation of databases on fish population will improve international cooperation between Izembek and Canadian Ramsar sites, between which salmon migrate.

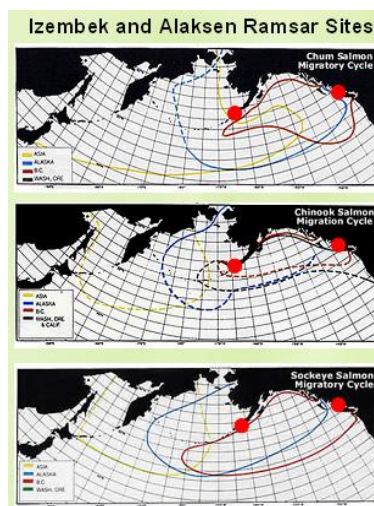


Photo: [www.sookesalmonenhancementsociety.com](http://www.sookesalmonenhancementsociety.com)

*Increase awareness about the importance of wetlands*

Data collected can be used for the U.S. FWS's National Wetlands Inventory, which currently provides no data for the Izembek area.<sup>14</sup> In addition, the Izembek website mentions fish infrequently and instead focuses on waterfowl. Adding information on the importance of wetland habitats for fisheries will help Izembek implement COP 9's recommendation to promote understanding of the role wetlands play for fisheries. This information will be made available not only to people in Izembek. Increasing signage about the relation between wetlands and fisheries in wetlands around Izembek will also accomplish the same goal of increased awareness on location.

Program Goals

Managing wetland ecosystems to ensure quality habitat for fisheries species

- Collect and analyze data to assess fisheries ecosystems' health
- Create a database for sharing fisheries ecosystem information

Enhancing international cooperation

- Monitor fish populations
- Increase cooperation between the U.S. and Canada
- Share information and research
- Monitor fish migration patterns between international sites

Increasing wetland awareness

- Educate visitors and locals of the relationship between wetland ecosystems and fishery health
- Strategically place informational signs near important and popular wetland areas
- Update the website to provide an arena for interested people (visitors or not) to learn about the importance of wetlands for fisheries
- Create an accessible and updatable information source

To implement FishMAP, the staff of Izembek NWR, under the jurisdiction of the USFWS, will begin to monitor the abundance and distribution of eelgrass beds, salinity of the Izembek Lagoon water, and will continue to monitor fish populations within a tributary leading to the lagoon. In addition, the program includes a project aimed at increasing the awareness of the importance of wetland ecosystems for healthy fisheries through increasing signage in the refuge and updating the Izembek website to reflect the importance of wetlands for fisheries.

**FishMAP Design and Implementation Tasks**

As stated above, FishMAP will focus on three smaller projects, which are monitoring wetland ecosystems, monitoring fish populations as part of a strategy for greater international cooperation, and increasing awareness of the importance of wetland

ecosystems for healthy fisheries. More explicitly, each project will be implemented as follows:

### ***Izembek Lagoon Project: Wetland Ecosystem Monitoring***

#### *Eelgrass Monitoring*

The eelgrass monitoring project aims to collect and analyze data to assess the impact of eelgrass on fisheries health. The state of the eelgrass is important not only because it is a primary food for lower tropic level fish and other aquatic species, but also because monitoring for increased pollutant levels will allow for early detection of increased nitrogen, phosphorus, etc. levels. Eelgrass biomass will be continually sampled and analyzed with respect to fisheries health. This information will be entered into a database, which, along with a monitoring protocol, needs to be developed in order to have comparable data across various Ramsar sites. The University of Alaska currently has such a database; and expansion upon their database to make it more of a shared resource will accomplish this goal. While the duties of this project will fall under the supervision of the Fisheries Biologist, much of this work will be contracted out to the University of Alaska. In addition, relevant historical data of eelgrass abundance and distribution will continue to be analyzed. Field studies of ten randomly selected areas will be implemented in order to get detailed information on eelgrass health. Also aerial photography will be used in order to view eelgrass cover throughout the entire refuge. In order to collect aerial images, the Fisheries Biologist will accompany the pilot on two flights throughout the year.

#### *Salinity Testing*

Salinity testing will give an indication of changes in the tidal inflow into the lagoon. As seawater enters the lagoon only during high tide, any change in sea level will affect the salinity of the lagoon and affect the delicate balance of fish and other species living within Izembek. In order to carry out the salinity testing portion of the monitoring project, the U.S. Environmental Protection Agency's guidelines for water monitoring will be used by Izembek staff. Various monitoring systems will be set up around the Izembek Lagoon. The ten randomly selected monitoring sites used in eelgrass monitoring will also be used for salinity testing. This data will be compared with the U.S. Geological Survey (USGS) data that is available for neighboring areas. All the data collected will be recorded, reported, and analyzed in order to provide information on the health of the lagoon ecosystem.

### ***Mortensens Creek Project: Enhancing International Cooperation***

#### *Weir Monitoring*

Mortensens Creek is a major migratory route for salmon coming in and out of Izembek Lagoon on their way to spawn and after hatching. Video weirs will be used to monitor the migration of salmon in the Izembek region. A video weir is simply a structure that allows for the monitoring and counting of passing fish using state-of-the art video cameras,

which impose less stress on fish than older technologies. The video weir monitor will be installed in Mortensens Creek by a field technician. This technician will also perform maintenance operations on the weir monitor throughout spawning and migration seasons. In order to have a complete picture of fish populations the refuge needs a continuous data source.

The Fisheries Biologist will collect and analyze fish population data, such as age, size, and length of each fish caught by the video monitor. The Fisheries Biologist will record collected data into a database. In addition, a seasonal Assistant Technician from the King Cove Native Association (KCNA) will assist with the technical and biological aspects of the weir monitoring project.

#### *International Cooperation on Sharing Information*

The data collected by the video weir monitor will be entered into an international database. The field technician will create this shared database to enable coordination between various agencies, specifically the Alaksen Ramsar site in Canada, the Alaska Department of Fish and Game, and the KCNA. This database will serve as a source of information on fisheries stocks and management plans.

#### ***Promoting Izembek Project: Increasing Wetland Awareness***

##### *Increasing Signage*

Refuge staff must locate the most popular wetland access areas in the refuge. These areas will be the future location of informational signs describing the need to have healthy wetland ecosystems in order to have productive fisheries. The Deputy Director will be in charge of identifying these areas and writing the necessary educational information. A graphic designer, possibly from a university, will be contracted to design the signs and a local sign shop will produce the signs to be weatherproof and durable. After the signs are produced, a group of student volunteers, led by the Deputy Director, will install the signs in the previously selected areas.

##### *Updating the Website*

Updating the Izembek website ([www.izembek.fws.org](http://www.izembek.fws.org)) as well as the portion of the NWRS website about Izembek ([www.fws.gov/Refuges/profiles/index.cfm?id=74520](http://www.fws.gov/Refuges/profiles/index.cfm?id=74520)) will provide interested parties with access to a reliable information resource specifically regarding the relationship between wetlands and fisheries. After the Fisheries Biologist decides what information to add, he or she will forward the information to the USFWS webmaster so that updates can be made. Additionally, the Fisheries Biologist will work with IT staff to create interactive learning tools that are appropriate for all knowledge levels.

#### **Analysis of Proposed Changes**

Each of the three proposed projects will have significant benefits to the refuge.

The salinity testing and eelgrass monitoring projects will serve as an early warning system. With the possible sea level rise associated with global climate change, the lagoon may be inundated with increasing amounts of salt water, upsetting the balance of nutrient levels that many organisms depend on. Although monitoring will not in itself mitigate sea level rise, it will provide evidence of sea level rise if and when it occurs. This monitoring may lead to the development of an alleviation plan that would maintain the integrity of the lagoon ecosystem.

Currently, there is no monitoring of eelgrass, water salinity, or fish populations. In the past, weir monitoring occurred adjacent to Izembek, but this monitoring project has been discontinued, due to monetary limitations. However, because of the great economic importance of fisheries for this region, this program will reinstate weir monitoring in the area. In addition, the technologies used will be state-of-the art video weir monitors that impose less stress on fish than the older technologies. In order to have a complete picture of fish populations the refuge needs a continuous data source. Although the most recent data suggest that fisheries in the area are quite healthy, there is still a need for monitoring of fish populations in order to be aware of possible future declines of fisheries resources.<sup>15</sup>

Increasing signage and updating the website are effective ways of increasing awareness of wetlands. Visitors and locals alike will be informed of the important role that wetlands play in maintaining healthy fisheries. Currently in Alaska a debate exists over whether to build a 30-mile road through the Izembek National Wildlife Refuge, which is a Ramsar site, to connect the people of King Cove to the airport in Cold Bay<sup>16</sup>. The environmental organization “The Defenders of Wildlife” have expressed concern about this plan believing that the development will threaten the habitat of essential species such as tundra swans, emperor geese, threatened Steller's eiders, and the entire Pacific Coast population of black brant. In addition, the road construction could threaten the subsistence of brown bears, wolves, chum and king salmon. Governor Frank Murkowski and other local politicians are in favor of the road. Although many environmentalists oppose such a project, a road could likely be welcomed by many of the residents of the area. However, by increasing awareness of the importance of the natural resources in the area that would be disturbed by a road, perhaps the environmental side could gain more support for protecting the area.

### **Existing Organizational Structure and Staffing Patterns**

In the U.S., the implementation of Ramsar recommendations and the management of the National Wildlife Refuge System fall under the jurisdiction of the U.S. Fish and Wildlife Service (USFWS). The USFWS has a decentralized hierarchical management system, based in Washington, D.C. The Director and Deputy Director of the USFWS manage eleven Assistant Directors, who are in charge of specific programs such as the National Wildlife Refuge System, Migratory Birds, Endangered Species, and Law Enforcement. The Director and Deputy Director also manage eight Regional Directors who supervise USFWS actions in certain geographical areas. As Izembek is located in Alaska and is a

National Wildlife Refuge, this project is under the jurisdiction of the National Wildlife Refuge System and Region 7 branches of the USFWS.

At the local level, Izembek staff consists of seven employees: a Refuge Manager, Deputy Refuge Manager, two Administrative Technicians, an Airplane Pilot, Maintenance Mechanic, and a Wildlife Biologist. See appendix for a partial list of general job descriptions according to the USFWS as well as a complete organizational chart of USFWS.

**Year One Program Implementation Tasks:**

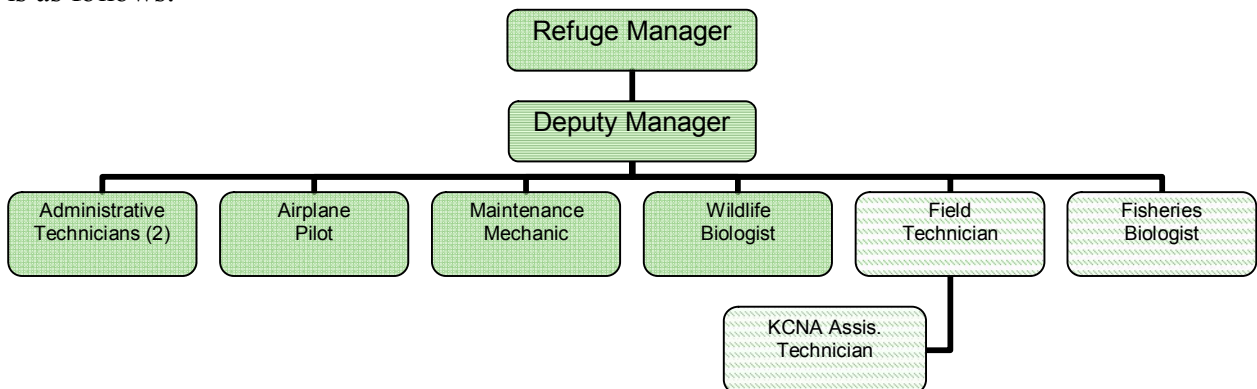
In the first year of the program, the following goals shall be met:

- Selection of appropriate monitoring sites for eelgrass and salinity testing
- Eelgrass and salinity testing
- Creation of ecosystem monitoring database
- Update of website
- Design of informational signs
- Installation of video weir monitor
- Creation of international fish population database

Included in the appendix is a project timeline for the first year.

**Proposed Program Organizational Structure**

As FishMAP is focused only on one Ramsar site the structure of the central organization, the USFWS, will not be affected. In addition, because of the small staff size at Izembek, there is not a pressing need for reorganization. However, there will be a few additions and changes to the Izembek staff. Most importantly, a Fisheries Biologist and Field Technician/Database Manager will be added to the staff, along with an Assistant Technician to assist in the new monitoring operations. The new organizational structure is as follows:



*Chart 1: Proposed Organizational Structure for the Izembek NWR after FishMAP implementation. Solid boxes represent unchanged positions. Striped represent positions that have a significantly updated position description. Cross-hatched boxes represent new positions.*

The staff will be designated to the various projects as follows:

### **Position Descriptions**

The following are position descriptions for the additional Izembek staff as well as updated descriptions of the positions that will change in order to accomplish the proposed project. These include the addition of a Fisheries Biologist and an Assistant Technician from the King Cove Native Association (KCNA) as well as changes to the job functions of the Deputy Refuge Manager and Maintenance Mechanic.

#### ***New Positions***

##### *Fisheries Biologist*

The fisheries biologist will be hired through the FWS at a series/grade of GS - 0340-5/7 with promotion potential of GS -11/12. This is an initial salary range of \$31,209.00 to \$40,569.00. The Fisheries Biologist will be in charge of collecting and analyzing lagoon salinity data and fish population data. The Fisheries Biologist will also cooperate with the eelgrass monitoring contractor. The contractor will report this information to the Fisheries Biologist, who will then report this data to the EPA and USGS databases in order to encourage cooperation between refuges. This work will involve extensive field time during the summer season. The Fisheries Biologist will go on two flights per year to take aerial photographs of eelgrass coverage. The Fisheries Biologist will also cooperate with international organizations, especially with the Alaksen Ramsar site in Canada, a major stop on the migration route of salmon in the area, and other Ramsar sites throughout the world. Using the collected information, the Fisheries Biologist will be expected to create a fisheries management plan to ensure the long-term viability of the fisheries at Izembek.

##### *Field Technician and Database Manager*

The field technician and database manager will be hired through the FWS as a GS-5 with promotion potential up to GS-10. This translates to a salary of \$25,295 TO \$32,855. During the first spring of the project, the field technician will install the video weir monitoring system in Mortensens Creek. During the summer months, the Field Technician will be responsible for maintaining the video weir system as is expected to spend extensive time in the field. In the winter months, the technician will create a database to enable sharing of fisheries information between Izembek and the Alaksen site in Canada, among other sites if possible.

##### *King Cove Native Association (KCNA) Field Technician Assistant*

The KCNA assistant will be hired by the FWS seasonally. During the summer months, the KCNA Assistant Technician will assist the Field Technician and Fisheries Biologist in monitoring eelgrass, salinity, and fish populations. In addition, the Assistant Technician will be expected to coordinate with the local community in order to increase

awareness of the wildlife refuge. The Assistant Technician must be a member of the Kings Cove Native Association with an interest in fisheries, wildlife, or wetlands.

***Existing Positions: New Duties and Responsibilities***

*Deputy Refuge Manager*

As the Deputy Refuge Manager has in depth knowledge of the wildlife refuge, he or she shall identify the most important and accessible wetland areas in the refuge as locations for informational signs concerning the importance of wetland ecosystems for fisheries. The Deputy Director will write all grant proposals and, with the Fisheries Biologist, be responsible for writing the information to be included on the signs. The Deputy Director will also coordinate with a contracted graphic designer to ensure that the signs are attractive and legible. The Deputy Director shall then coordinate with student volunteers to install the signs throughout the refuge. In a similar fashion, the Deputy Director, in cooperation with the biologists, will be in charge of producing a document about the importance of wetland ecosystems for fisheries health to incorporate into the various Izembek websites. The Deputy Director will be responsible for coordinating with the USFWS webmaster to get these updates online.

*Other Positions*

The Refuge Manager and Administrative Technicians will be required to coordinate with the different contractors. The Administrative Technicians may also be needed to assist in filling out paperwork. The Maintenance Mechanic will need to coordinate with the Deputy Director in order to ensure that all the necessary tools for installing signs are available for the student volunteers. The Airplane Pilot will take the Fisheries Biologist on two flights throughout the year and may also be required to transport various staff members to and from research locations.

**Contracting and Partnership Plan**

In order to implement this program, the Izembek staff will work in partnership with a number of institutions whose goals align with those of the refuge. These partnerships will develop relationships and ultimately be with:

- Alaska Department of Fish and Game
- University of Alaska
- Alaska Department of Environmental Conservation
- United States Geological Survey (USGS)
- Environmental Protection Agency – National and State Offices
- King Cove Native Association
- Student Volunteers

A number of tasks will need to be contracted out to other organizations. These include an experience wetland ecosystem biologist, graphic designer, sign producer, student volunteers, and an assistant technician. Job descriptions for contracted positions are as follows:



### *University of Alaska*

The USFWS fisheries biologist will be the point of contact with the ecologist at the University of Alaska and grant money will be directly allocated to the university. The university contractor will use EPA techniques to monitor and collect eelgrass samples throughout the Izembek Lagoon. The University of Alaska has previous experience with eelgrass monitoring and has access to monitoring supplies. In addition, as a research institute, the methods used and data collected by the University of Alaska will be reliable.

### *Graphic Designer*

The graphic designer will be recruited by the Refuge manager. The graphic designer will create attractive signs using the information provided by the Deputy Refuge Manager. These signs should be appealing and legible. In addition, the signs should be noticeable but not detract from the surroundings. The graphic designer should be a college or graduate student from a university in the U.S. The designer may be a single student or a group of students working on a project for a class or interested in receiving internship credit for their services.

### *Sign Producer*

The Refuge manager will solicit bids from local vendors preferably for the production of the signs. \$800 has been allocated for this task. He or she will receive the sign design from the Deputy Refuge Manager. The signs will be made using environmentally friendly materials that will withstand the harsh Alaskan climate. The signs should resist fading and cracking.

### *Student Volunteers*

The student volunteers will be hired by the Refuge manager and will be provided room and board for the duration of the project. They will install the signs around the refuge. After this work is completed, students will assist with other projects around the refuge, such as helping to clear vegetation from the video weir monitor, collecting eelgrass and salinity samples, as well as other ongoing projects in the Izembek NWR. Volunteers should be interested in fisheries, wetlands, or wildlife in general. Students will be responsible for providing their own transportation to and from Anchorage if they are not from the area.

### **Analysis of the impact on current organization, personnel, and financial and physical resources**

As explained above, FishMAP will result in an increase in the number of full and part time staff. Each one of the full time staff members must go through an extensive two-week training course and be transported to Izembek. Also, additional capital resources will be needed to begin each of the programs. In all, the new program will require

approximately \$160,860.00 in additional funding. The specific impacts of each project are discussed below.

***Izembek Lagoon Project: Eelgrass and salinity monitoring***

The monitoring projects necessitate the addition of a Fisheries Biologist to the Izembek staff. In order to compensate these employees in the long term, increased funding will need to be secured from the USFWS. In addition, the new Fisheries Biologist may require a desk and office supplies as well as field supplies and gear. The monitoring project itself will require sampling tools as well as materials needed to analyze the collected samples.

***Mortensens Creek Project: Weir monitoring and international fisheries database***

In conjunction with the eelgrass and salinity monitoring projects, the fish population monitoring project will require a Fisheries Biologist, as well as a Field Technician/Database Manager and a seasonal Assistant Technician. Transportation to and from the monitoring site at Mortensens Creek, possibly by all terrain vehicle (ATV), will have to be provided. This may require additional training in the use of ATVs. In addition, the project requires additional field supplies and the weir monitor itself.

***Promoting Izembek Project: Increased signage and website update***

The awareness-raising project requires no additional full-time staff, but does add to the job description of the Deputy Refuge Manager and Maintenance Mechanic. In addition, the Refuge Manager will have to organize the contracting agreements. Coordinating with the contracted graphic designer and sign producer may take a lot of the staff's time. In addition, the sign producer will have to be monetarily compensated. The project will involve extra supplies, room and board for the student volunteers for a few weeks during the summer.

**Program Costs and Grants**

In 2006, the Izembek National Wildlife Refuge had an annual budget of \$1,200,000. The FishMAP budget includes a program description and a program budget for each of the six implementation task. In addition, there is a line item budget for the entire FishMAP program. Line item budgets for each implementation task are included in Appendix III. The funding is allocated into two general categories: personnel services and other-than-personnel services. Personnel services include salaries and benefits. Other-than-personnel services include contracts, training, supplies, travel, and office expenses. This program will begin as a test program and as such all new employees will be term employees. This will enable us to pay USFWS full time employees with grant money.

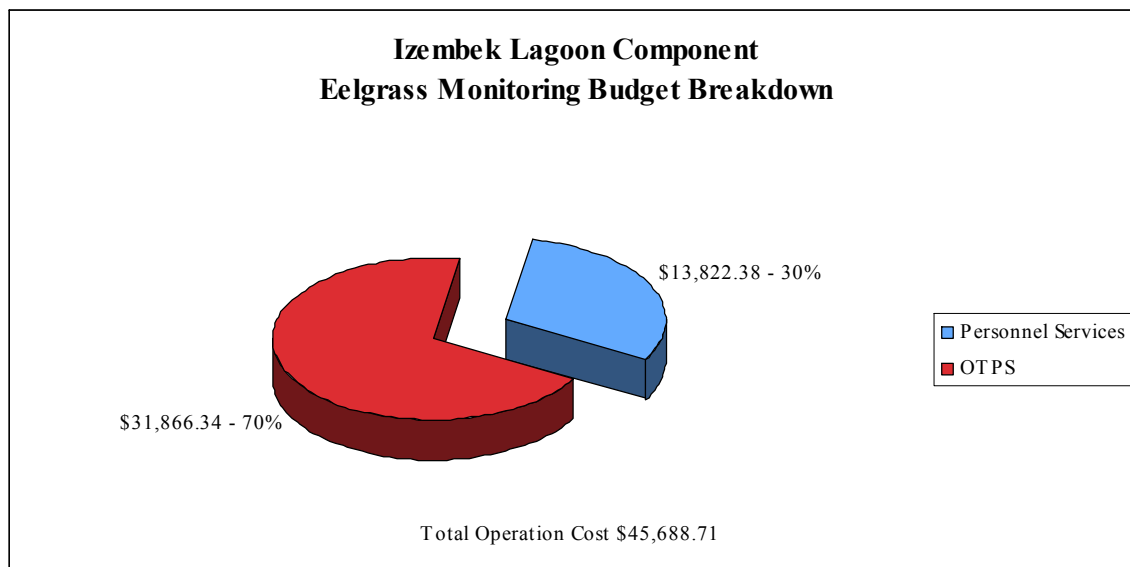
Personnel costs were determined using general schedules and pay scales for the U.S. government salary table. All employees will receive 25% benefits. The costs of eelgrass monitoring, salinity monitoring, and weir monitoring were determined using budgets and

methodologies from existing studies.<sup>17</sup> Personal interviews were conducted to determine the typical costs for utilities and office expenses for a small business in rural Alaska.<sup>18</sup> Travel expenses and training costs were estimated using internet research.<sup>19</sup>

The success of FishMAP depends on securing grant funding. The USFWS compiles a list of grants that programs in the state of Alaska are eligible to apply for. The four grants chosen for FishMAP were selected from this list. The grants were chosen because their deadlines fit within the required time frame and because FishMAP is likely to receive the grants because the implementation tasks fulfill the requirement. If only a portion of the grant funding is available, then FishMAP contains a contingency plan.

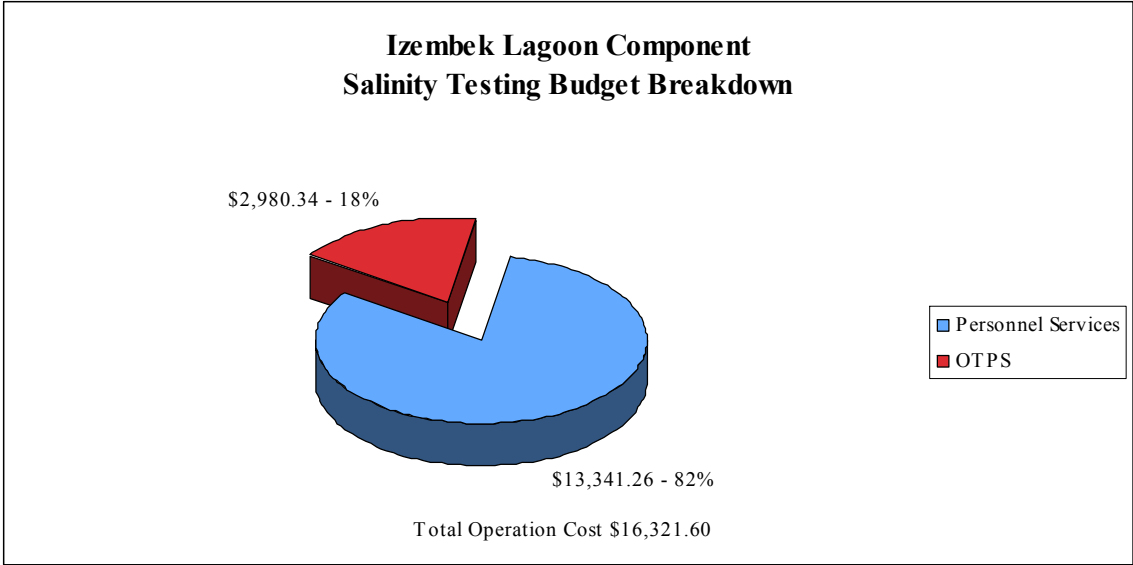
### *Izembek Lagoon Project - Eelgrass Monitoring*

The total cost for eelgrass monitoring is \$45,688.71. The total personnel services cost for eelgrass monitoring is \$13,822.38. The cost is derived from the salaries for the Fisheries Biologist, the Marine Biologist, the Assistant Technician and the Maintenance Mechanic. The total other than personnel services cost is \$31,866.32. Other than personnel services includes travel expenses to and from Izembek, University of Alaska contract fee of \$1500, and various capital equipment expenditures, such as Graphical Information System units.



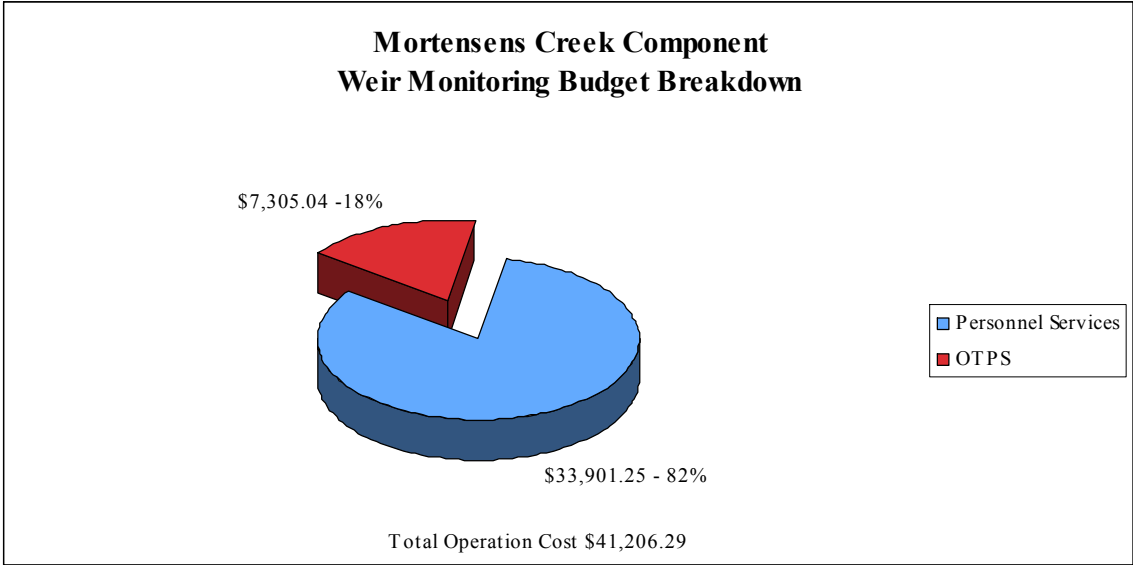
### *Izembek Lagoon Project - Salinity Testing*

The total cost for salinity monitoring is \$16,321.60. The total personnel services cost for salinity monitoring is \$13,341.26. The task will be implemented by the Fisheries Biologist, the Assistant Technician, and the Maintenance Mechanic. The total other than personnel services cost for salinity monitoring is \$2,980.34. Included in these expenses are transportation costs and testing equipment.



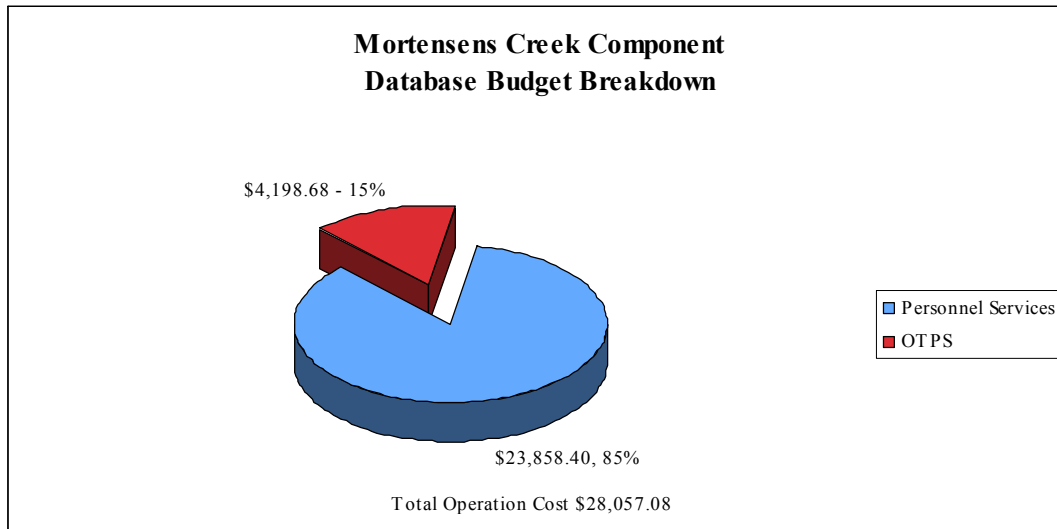
*Mortensens Creek Project - Weir Monitoring*

The total cost for weir monitoring is \$41,206.29. The total personnel services cost for weir monitoring is \$33,901.25. The task is implemented by the Fisheries Biologist, the Wildlife Biologist, the Technician, the Assistant Technician, and the Maintenance Mechanic. The total other than personnel services cost is \$7,305.04. Other than personnel services includes the cost of the materials to construct the Weir monitoring equipment station, as well as, transportation expenses to Vancouver in order to promote international cooperation. The Fisheries Biologist will be asked to travel to Vancouver for five days to meet with the Biologists at the Alaksen Wildlife Refuge to coordinate international fisheries monitoring.



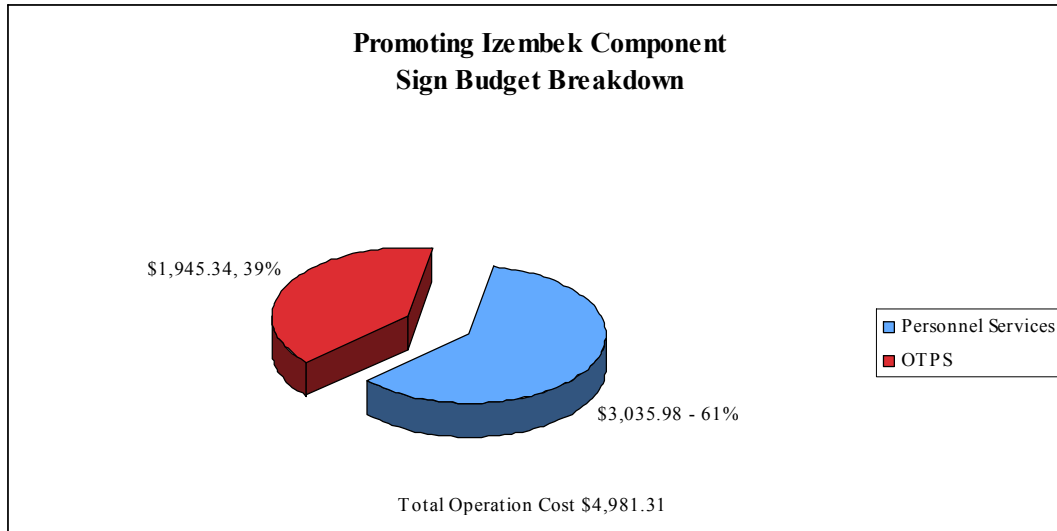
### *Mortensens Creek Project - Create Database*

The total cost for creating the database is \$28,057.08. The total personnel services cost is \$23,858.40. The database will be created and maintained by the Technician. The total other than personnel services cost is \$4,198.68. This includes capital expenditures, such as computer software and equipment. A moderate proportion (20%) of the total office expenses are allocated to travel because a majority of the project will be conducted in the office.



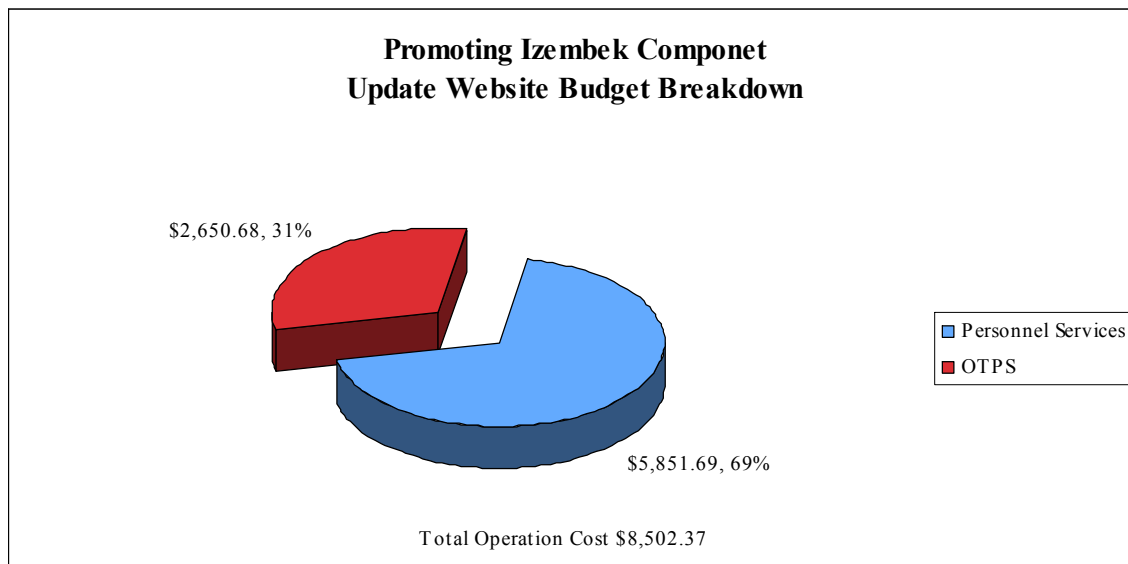
### *Promoting Izembek Project - Increase Signage*

The total cost for increasing signage is \$4,981.31. The total personnel services cost is \$3,035.98. This expense is for the salary for the Deputy Refuge Manager. The Deputy Refuge Manager will determine popular wetland areas to locate the signs. He will also write the educational information that should be written on the signs. A graphic design student from the University of Alaska will be contracted to design the layout of the signs. A sign producer will be contracted to produce the signs. Four student volunteers from the high school in Cold Bay will participate in a one week “Environmental Education” program at Izembek. During the program, the students will install the signs. The total other than personnel services cost is \$1,945.34. This expense covers the contracts for a graphic design student and a sign producer, as well as, transportation costs.



*Promoting Izembek Project - Update Website*

The total cost for updating the website is \$8,502.37. The total personnel services cost is \$5,831.69. The fisheries biologist will decide what information should be added to the website. He will also create interactive learning tools that can engage children in learning about the environment. All of the updates will be sent to the U.S. Fish and Wildlife Service (USFWS) web-master to update the website at no additional cost. The total other than personnel service cost is \$2,650.68 for computer equipment. A moderate proportion (20%) of the total office expenses are allocated to this task because a majority of the project will be conducted in the office.



### *Additional Costs*

#### ***Training***

The fisheries biologist and the technician will both participate in a one-day training course for bear safety. The cost is indicated in the budgets for the eelgrass monitoring, the salinity testing and the weir monitoring. The budgets are allocated according to the relative importance of bear safety for participating in the task.

#### ***Supplies***

In addition to the supplies required for the eelgrass monitoring, salinity testing and weir monitoring, office equipment and supplies are also required. The bulk of this expense will be two new computers purchased for the fisheries biologist and the technician as previously mentioned.

#### ***Travel***

The USFWS already owns at least one boat and one ATV that can be used for FishMAP. It is not necessary to purchase or rent additional vehicles. The USFWS airplane pilot will fly all flights between Izembek and Anchorage.

#### ***Office Expenses***

The total cost for office expenses includes utilities, overhead, wireless internet, phone, and mail. Since there are currently six full-time staff in the Izembek office and our program plans to add two more full time staff, we determined that the program will be responsible for 25% of all general office costs. We interviewed a small business owner in Alaska and determined that the cost of all utilities should be approximately \$900 per month with an additional overhead of \$400 per month. From these numbers we determined the office expenses will cost approximately \$8,258.40 per year. Rent is not factored into the office expenses. The USFWS already owns a building in the Izembek National Wildlife Refuge that can be used for office space for FishMAP at no additional charge.

#### ***Community Outreach***

The Assistant Technician is a member of the Kings Cove Native Association with connections to the area. The Assistant Technician will coordinate with the local community to increase awareness of the wildlife refuge. One third of the seasonal salary is allocated to pay for community outreach.

#### ***Administrative Costs***

The Refuge Manager, the Deputy Refuge Manager and one of the Administrative Technicians are all allocated a part of the budget for administrative tasks such as organizing plane flights and activities for student volunteers.

## *Grants*

FishMAP will depend entirely on grant funding. The USFWS recommends several grants for the state of Alaska (a complete list can be found at [http://alaska.fws.gov/grants/particular\\_state.htm](http://alaska.fws.gov/grants/particular_state.htm)). For the FishMAP program, the Deputy Refuge Manager will write grant proposals to apply for the following grants:

1. **Fisheries Resource Monitoring:** “To support projects that gather information to manage and conserve subsistence fishery resources in Alaska.”
2. **Partners for Fisheries Monitoring:** “To fund fishery biologist and social scientist positions within tribal or rural organizations in Alaska to develop scientifically sound fisheries monitoring projects.”
3. **North American Wetlands Conservation:** “To provide funding assistance to promote conservation of wetlands and associated habitats for migratory birds and other wildlife”
4. **Coastal Conservation:** “To protect, restore, and identify nationally important coastal fish and wildlife habitats with particular focus on projects benefiting migratory birds, anadromous fish, marine mammals, and endangered species.”

The proposal deadline for the grants for Fisheries Resource Monitoring and Partners for Fisheries Monitoring are due in November, 2006. The proposal deadline for the North American Wetlands Conservation grant is December 1, 2006 and the proposal deadline for the Coastal Conservation Grant is February 15, 2007. The announcement of awards is generally made the following month. Therefore, all of our funding should be available by March, 2007. All grants total \$161,000 with a detailed breakdown in the appendix.

## *Contingency Plan*

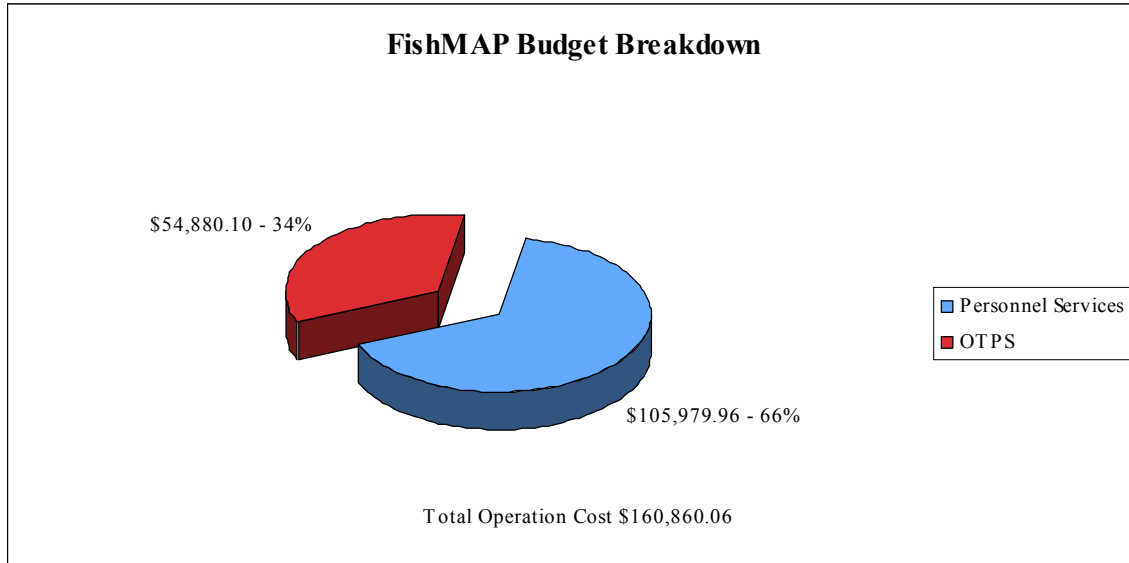
If FishMAP does not receive all of the funding from grants, some budget cuts could be made. There are several alternatives for eelgrass monitoring that will cost less money. In 2005 a researcher at the University of Alaska received a grant for eelgrass monitoring that could potentially cover the cost of a contract and flights. In addition, the university may be able to provide some of the supplies for eelgrass monitoring. Alternatively, instead of aerial photography, an underwater video monitor could be used for eelgrass monitoring which would require an underwater camera and gas to travel the thirty-mile length of the lagoon. A third option would be field monitoring, which would not include any costs for supplies. In addition, the cost for the signs could be decreased by choosing less expensive signs, and finding a Graphic Design student who would be willing to design the signs for free.



## Budget Revenue Plan Program and Analysis

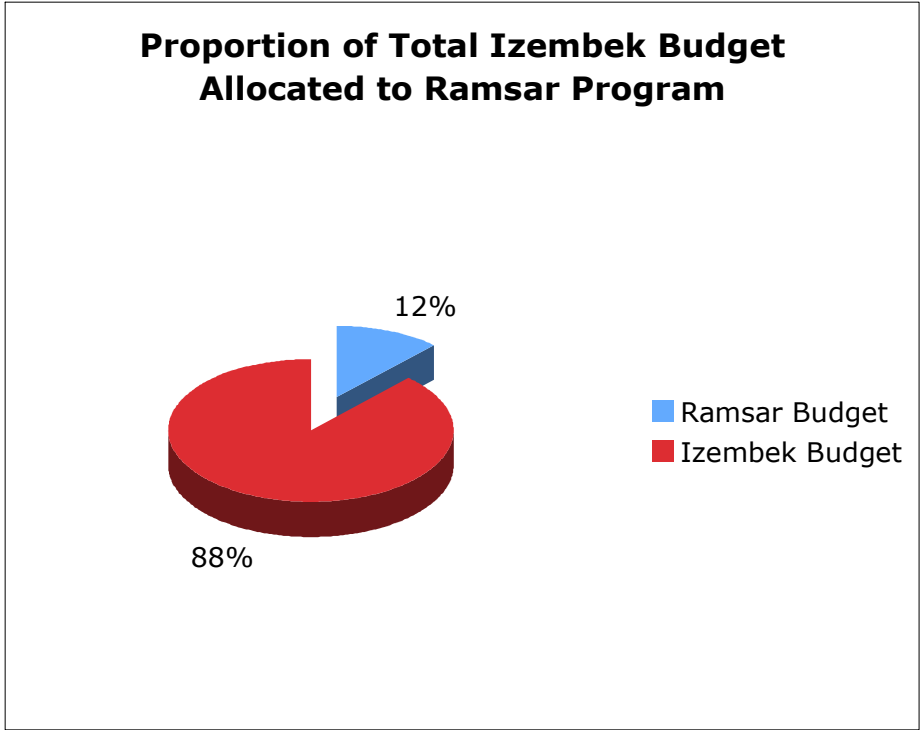
### *Summary*

The total operation cost for FishMAP is \$160,860.06. The total personnel services cost is \$105,979.96 and the total other than personnel services cost is \$54,880.10. If FishMAP receives funding from all four grants, the total grant funding will be \$161,000.

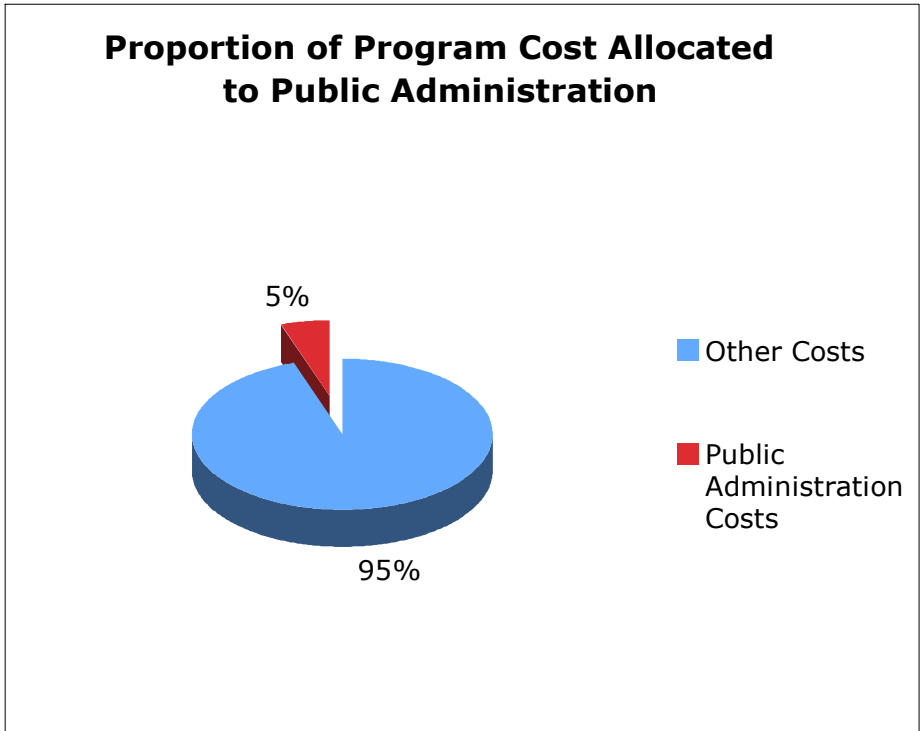


### *Analysis*

FishMAP only represents 11.82% of the Total Izembek Budget (see figure 1 below). In terms of budget requirement, FishMAP is very cost efficient. The total personnel services costs represent 65.88% of the total budget and the total other than personnel services cost represent 34.12% of the total budget. This indicates that there is an emphasis on staff in FishMAP. Furthermore, the administration costs are extremely low. In total, the administration costs represent only 5.18% of the total budget for FishMAP (see figure 2 below). Furthermore, they represent only 0.61% of the total budget for the Izembek National Wildlife Refuge (\$1,360,860.06 including FishMAP). The low administration costs suggest that the program is highly cost efficient since most of the costs are going to services. Finally, a majority of the other than personnel expenses are allocated to supplies (71.04%). Most of the supply costs are for monitoring the Izembek ecosystem, which will be essential to the success of the program.



**Figure 1:** This pie chart illustrates the proportion of the Total Izembek Budget that is allocated to Fish MAP.



**Figure 2:** This pie chart illustrates the Proportion of Fish MAP Cost Allocated to Public Administration.

## **Performance Management**

### *Rationale*

For each of the three FishMAP program tasks, which include the Izembek Lagoon Project, the Mortensens Creek Project, and the Promoting Izembek Project, a performance measurement system is required to gauge the progress of each over time. Since all of FishMAP's funding comes from grants, it is especially important for the program to demonstrate accountability of fund usage to the four Federal and State grant agencies. The performance measurement system requires three components:

- 1) Indicators to show whether the program is effective;
- 2) A system with measuring, collection and reporting mechanisms to allow program operators to keep track of indicator status; and
- 3) A feedback mechanism for the program to provide task evaluations to those responsible for performing them, and thus ensure continuous improvement.

For these three components, the first two components, 1) indicators and 2) measuring, collection and reporting mechanisms, the task descriptions will be somewhat different for the three tasks (Izembek Lagoon Project, Mortensens Creek Project, and Promoting Izembek Project). However, the third component, feedback mechanism, will essentially be the same for all three tasks. Therefore, the following section will cover the indicators and measuring, collection and feedback mechanisms of each individual task, then proceed to the feedback mechanism they have in common.

### ***The Izembek Lagoon Project***

#### *Indicators*

For both eelgrass monitoring and salinity testing, the success of monitoring will be based on its coverage of the quantity as well as quality trends of wetland health, and the frequency of monitoring and database entry. For quantity trends, eelgrass monitoring aims to survey 100% of Izembek reserve's eelgrass beds per month to keep track of area changes in time. Salinity testing aims to test salinity in 50 sampling locations in Izembek per month. Quality trends of the wetland will be assessed by eelgrass monitoring for presence of pollutants affecting eelgrass health, eelgrass population structure diversity, and the depth of eelgrass beds. Quality measurements only need to be performed in 50 sampling locations. Salinity testing will focus on quality measurement. The project aims to test salinity levels in 50 different sampling locations per month. The success of database entry will be indicated by the time between collection of data and entry into the database. The project aims to update the database within 24 hours of data collection. Another indicator for success will be the number of fisheries management agencies accessing the database. This can show whether improvements in the availability of information on wetlands can influence fisheries management.

#### *Measuring, collection and reporting*

The responsibilities for assessing and reporting these indicators will be divided among people involved in the program. The Fisheries Biologist will produce quarterly reports on

monitoring performance. The Technician will be in charge of monthly reviews of the database to determine the frequency of data entry, how many times the database has been assessed, and whether data is missing. Monthly performance on monitoring and database entry will also be recorded on a performance worksheet to be reviewed during monthly review meetings. The reports on monitoring will be submitted to the Deputy Manager. An annual report on monitoring results will be reviewed by the Refuge Manager himself. However, if drastic changes are recorded in salinity and eelgrass health trends, they can be reported to the Refuge Manager immediately.

### ***Mortensens Creek Project***

#### *Indicators*

Indicators for evaluating the performance of this task include indicators for surveying and indicators for data entry. For surveying, success will be based on the percentage of fish monitored for age, sex and length. The program aims to collect information on 10% of the total fish counted by the weir. Weir monitoring performance will also be evaluated based on the number of missed monitoring days, which the program aims to keep below two days per month. For data entry, performance will be based on the time lag between data collection and entry, and the number of fisheries management agencies accessing the database. The program aims to update the website within 24 hours of data collection.

#### *Measuring, collection and reporting*

For this project, the Fisheries Biologist will review the number of fish counted weekly to estimate the number of fish to be sampled. The technician will be in charge of monthly reviews of the database to determine the frequency of data entry, how many times the database has been accessed, and whether data is missing. Monthly performance on monitoring and database entry will be recorded on a performance worksheet to be reviewed during monthly review meetings. Like the first task, unusual trends can be reported to the Refuge Manager directly.

### ***Promoting Izembek Project***

#### *Indicators*

For the first task in this project, increasing site signage, the performance will first and foremost be evaluated by the number of signs installed, which is anticipated to be ten. Another indicator is the durability of signs, which can be evaluated by sign maintenance records. The third indicator measures the usefulness of signs. It will be assessed by surveys at the visitor's center to collect people's opinions of signs. For the website updates, a performance indicator will be the frequency of updates, which is anticipated to be once a month. The usefulness of the website will be based on the number of people visiting the site and the most popular pages. The technician accesses this information using the web counter, which can show how many people are visiting the web site. The goal is to have 50% of visitors to the Izembek website visit a Ramsar related page.

#### *Measurement, Collection and Feedback*

For the first task, increasing signage, the deputy manager will be responsible for checking

the signs a week after the reported installation to make sure they are installed. The Deputy Manager will also design a survey form that visitors can use to evaluate the usefulness of signs. The durability of the signs will be assessed by the Technician, who will make fill in a monthly performance worksheet concerning sign maintenance. The photos of the installed signs and survey results will be presented at monthly review meetings. For the second project, updating the Izembek website, the Fisheries Biologist will maintain correspondence with the U.S. Fisheries and Wildlife webmaster to ensure that the website is updated on time. The webmaster will fill in a monthly performance worksheet on the number of visitors to the Izembek webpage and the most frequently visited pages, to be reviewed during monthly review meetings.

### ***Feedback mechanism for the three projects***

The feedback mechanism is the same for the three projects mentioned above. Since this is a small project with a small number of staff, feedback will mostly be presented at monthly face-to-face review meetings involving all staff. The implementation of the program will be evaluated to see what changes are necessary, based on circumstances or inability to meet measurement standards. The idea of a performance measurement system is to identify how well the program is functioning so as to make continuous improvements. As most of the program's funding comes from grants, it is especially important to demonstrate our program's ability to meet goals in order to secure future funding.

### **Conclusion**

We hope that the implementation of this program will lead to a more integrated approach of fisheries into the overall management plan of the Izembek NWR. We also hope that this program may serve as a template that other Ramsar sites can look to for inspiration when trying to incorporate fisheries into their management plans.



## References

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- <sup>1</sup> Food And Agriculture Organization Of The United Nations, “The State of World Fisheries and Aquaculture (SOFIA) 2002,”  
<http://www.fao.org/docrep/005/y7300e/y7300e05.htm>
- <sup>2</sup> EPA, “Economic Benefits of Wetlands,”  
<http://www.epa.gov/owow/wetlands/pdf/EconomicBenefits.pdf>, EPA 2006
- <sup>3</sup> EPA, “Functions and Vaues of Wetlands,”  
[http://www.epa.gov/owow/wetlands/pdf/fun\\_val.pdf](http://www.epa.gov/owow/wetlands/pdf/fun_val.pdf), EPA 2001
- <sup>4</sup> Food And Agriculture Organization Of The United Nations, “The State of World Fisheries and Aquaculture (SOFIA) 2002,”  
<http://www.fao.org/DOCREP/003/X8002E/x8002e04.htm>
- <sup>5</sup> Dahl, T.E. 2006. “Status and Trends of Wetlands in the Conterminous United States 1998 to 2004.” U. S. Department of the Interior; Fish and Wildlife Service, Washington D.C.
- <sup>6</sup> Ramsar Convention on Wetlands 2001 <http://www.ramsar.org/>
- <sup>7</sup> Ramsar Convention on Wetlands, 2006 “The Ramsar Info Pack: What is the Ramsar Convention on Wetlands?” [http://www.ramsar.org/about/about\\_infopack\\_2e.htm](http://www.ramsar.org/about/about_infopack_2e.htm)
- <sup>8</sup> Ramsar Convention on Wetlands 2001 “The Ramsar concept of ‘wise use’”  
[http://www.ramsar.org/about/about\\_infopack\\_7e.htm](http://www.ramsar.org/about/about_infopack_7e.htm)
- <sup>9</sup> The Ramsar Convention on Wetlands 2003 “The Ramsar Info Pack: The Ramsar Strategic Plan 2003-2008 and the "three pillars" of the Convention.”  
[http://www.ramsar.org/about/about\\_infopack\\_3e.htm](http://www.ramsar.org/about/about_infopack_3e.htm)
- <sup>10</sup> Mitsch, William J. and James G. Gosselink, *Wetlands*, 3rd edition, John Wiley and Sons, New York, 1993
- <sup>11</sup> Dahl, T.E. 2006. “Status and Trends of Wetlands in the Conterminous United States 1998 to 2004.” U. S. Department of the Interior; Fish and Wildlife Service, Washington D.C.
- <sup>12</sup> Ramsar Convention on Wetlands, 2006 “The Ramsar Info Pack: What is the Ramsar Convention on Wetlands?” [http://www.ramsar.org/about/about\\_infopack\\_2e.htm](http://www.ramsar.org/about/about_infopack_2e.htm)
- <sup>13</sup> Division of Commercial Fisheries, Alaska departmane of Fish and Game, 2006 Overview, <http://www.cf.adfg.state.ak.us/geninfo/about/budget/06overview.pdf>
- <sup>14</sup> USFWS, National Wetlands Inventory [www.fws.gov/nwi/](http://www.fws.gov/nwi/)

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- <sup>15</sup> USFWS, Estimation of Sockeye and Coho Salmon Escapement in Mortensens Creek, Izembek National Wildlife Refuge, 2005  
[alaska.fws.gov/fisheries/fieldoffice/kingsalmon/pdf/reports/Mortensens%20Creek%20Weir%202005%20DS%202006-2.pdf](http://alaska.fws.gov/fisheries/fieldoffice/kingsalmon/pdf/reports/Mortensens%20Creek%20Weir%202005%20DS%202006-2.pdf)
- <sup>16</sup> Defenders of Wildlife, Harmful Road Threatens Izembek Refuge (Again)  
[www.defenders.org/habitat/highways/new/states/images/izembek.html](http://www.defenders.org/habitat/highways/new/states/images/izembek.html)
- <sup>17</sup> USFWS, Estimation of Sockeye and Coho Salmon Escapement in Mortensens Creek, Izembek National Wildlife Refuge, 2005  
[alaska.fws.gov/fisheries/fieldoffice/kingsalmon/pdf/reports/Mortensens%20Creek%20Weir%202005%20DS%202006-2.pdf](http://alaska.fws.gov/fisheries/fieldoffice/kingsalmon/pdf/reports/Mortensens%20Creek%20Weir%202005%20DS%202006-2.pdf)
- <sup>18</sup> Paul Gaskin, personal interview, Oct 22, 2006
- <sup>19</sup> [Alaskaairlines.com](http://Alaskaairlines.com)



**9th Meeting of the Conference of the Parties to the  
Convention on Wetlands (Ramsar, Iran, 1971)**

*“Wetlands and water: supporting life, sustaining livelihoods”*

Kampala, Uganda, 8-15 November 2005

**Resolution IX.4**

**The Ramsar Convention and the conservation and  
sustainable use of fish resources**

1. RECOGNIZING the important role that inland, coastal and near-shore marine wetlands play in supporting fish populations and fisheries;
2. CONSCIOUS that fishing is of great social, cultural and economic importance throughout the world;
3. RECOGNIZING that fish are a vital source of food and income for millions of people, which can assist in the further reduction of poverty, and CONCERNED that the Millennium Ecosystem Assessment (MA) has reported that fish yields in many parts of the world are declining due to unsustainable harvest, habitat degradation, and loss of fish spawning and nursery grounds, as well as feeding and refuge areas;
4. CONCERNED by the loss of fish species and the increasing number of fish species recognized in the IUCN Red List as globally threatened, and AWARE of the important role that some Ramsar sites play in the conservation of endangered fish fauna;
5. RECALLING the relevance of the guidance adopted by the Convention on integrating wetland conservation and wise use into river basin management (Resolution VII.18) and coastal zone management (Resolution VIII.4) to securing the integrated management of wetland ecosystems upon which fish and fisheries depend;
6. ALSO RECALLING that in Resolution VIII.2 the Conference of the Parties encouraged "Contracting Parties, wherever possible and appropriate, to take the necessary steps in order to maintain the migration access for indigenous fish and other species past dams";
7. COMMENDING those Parties that have taken actions to conserve or restore native fish populations and their habitats, such as through habitat restoration, the provision of

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fish passages around in-stream infrastructure, the control of invasive alien species competitors, and/or the reduction of water pollution impacts;

8. NOTING the comparative ecosystem benefits gained from supplying food from sustainable fisheries in alleviating agricultural pressure on land and in reducing water pollution;

9. ALSO NOTING the widespread growth in aquaculture, its potential benefits and environmental costs, and the need for careful planning and management to avoid negative impacts upon native fish stocks and wetland ecosystems;

10. AWARE of the adoption by the UN Food and Agriculture Organisation (FAO) of the *Code of conduct for responsible fisheries* (1995) and its subsequent associated range of Technical Guidelines, and the recognition that these give to the need to promote sustainable use of fish resources and to mitigate impacts of aquaculture practices;

11. ALSO AWARE of the ongoing work of the Comprehensive Assessment of Water Management in Agriculture (CA) led by the International Water Management Institute (IWMI) and its relevance to issues of wetlands, capture fisheries and aquaculture;

12. NOTING the ongoing preparation of the *Principles for a Code of Conduct for the Management and Sustainable Use of Mangrove Ecosystems*, including the review of the draft Principles at Ramsar COP9 regional preparatory meetings for Africa, the Americas, and Asia, and RECOGNIZING the importance of reflecting several of these principles in national legislation and policies;

13. RECALLING that Action 1.2.6 of the Ramsar Strategic Plan 2003-2008 calls for an assessment of "the contribution of Ramsar sites and other wetlands to the maintenance of fisheries, including utilizing information available from the Millennium Ecosystem Assessment (MA) and other assessment programmes, and [recommendation of] sustainable management practices which can contribute to the WSSD target of, where possible by 2015, maintaining or restoring depleted fish stocks to levels that can produce the maximum sustainable yield";

14. RECOGNIZING that coral reefs are the most complex, species-rich and productive of marine ecosystems, covering less than 1% of the ocean's area yet home to one-third of all marine fish species, and that coral reef fisheries are estimated to yield 6 million metric tons of fish catch annually, with one-quarter of the total worldwide fish production being in developing countries with coral reefs;

15. AWARE of the WSSD Plan of Implementation actions concerning the establishment of marine protected areas, the CBD COP7 Decision VII/5 on marine and coastal biological diversity, and the recent work of the FAO Committee on Fisheries (CoFi) on the role of marine protected areas (MPAs) in fisheries management, and NOTING the

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urgent need to address the under-representation of protected areas in marine and coastal habitats and in inland waters;

16. NOTING the role played by The WorldFish Center as advocates and technical advisors in relation to fish resources and sustainable fisheries; and THANKING The WorldFish Centre, IUCN and WWF, working with the Scientific and Technical Review Panel, for their financial support for the implementation of Strategic Plan Action 1.2.6 through the preparation of a 'Review of Ramsar Sites and Fisheries Maintenance' to be published as a *Ramsar Technical Report*, and the outline issues and recommendations concerning wetlands and the conservation and sustainable use of fish resources annexed to this Resolution; and

17. ALSO NOTING that Wetlands International and IUCN-The World Conservation Union have established a Freshwater Fish Specialist Group that will provide advice on priority actions for freshwater fish conservation to Contracting Parties, river basin organizations and others;

#### THE CONFERENCE OF THE CONTRACTING PARTIES

18. ENCOURAGES Contracting Parties and others to take into account the recommendations annexed to this Resolution, adapted as appropriate for national and local conditions, when addressing issues of the sustainable use of fish resources in relation to the conservation and wise use of Ramsar sites and other wetlands;

19. URGES Contracting Parties to review their policy frameworks and institutional arrangements, in line with Resolutions VII.6 on National Wetland Policies and VII.7 on reviewing laws and legislation, so as to ensure that fisheries management authorities and those involved with conserving and/or managing aquatic biodiversity are aware of, complement and support national, subnational and local efforts to implement the Convention;

20. REQUESTS fisheries authorities responsible for managing fisheries within, adjacent to, or associated with Ramsar sites to ensure that the ecological character of the Ramsar site (or sites) is maintained;

21. URGES Contracting Parties and others to use the habitat and species conservation provisions of the Convention to support the introduction and/or continuance of spatial management approaches for fisheries, particularly in coastal and marine fisheries, and ALSO URGES the Ramsar Secretariat to work with other conventions and instruments concerned with the conservation of biodiversity and the management of natural resources, in order to promote the synergy and alignment of spatial planning and management approaches that benefit the conservation and sustainable management of fish populations and recognition of the contribution this makes towards meeting WSSD goals and Millennium Development Goals (MDGs);

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22. REQUESTS those responsible for the management of Ramsar sites to incorporate into their management planning processes, in line with Resolution VIII.14 on management planning, measures to maintain the ecological services of wetlands in support of ecologically sustainable fisheries;

23. REQUESTS Contracting Parties to review and, where necessary, enhance national and regional programmes for the systematic collection of data on fisheries, including artisanal fisheries, and data on aquaculture, of relevance to Ramsar sites and associated areas;

24. URGES Contracting Parties to take the necessary steps within their frameworks for integrated river basin and coastal zone management to maintain or reinstate fish migration pathways, to reduce the impacts of point source and diffuse pollution in all its forms, to establish and implement environmental flow allocations supporting the conservation of fish, to protect critical spawning and nursery grounds, and to restore relevant habitats where these have become degraded, taking into account the guidance adopted in Resolutions VIII.1 on water allocation, VIII.4 on ICZM, and VIII.32 on mangrove ecosystems;

25. URGES Contracting Parties carefully to control aquaculture (pond and cage culture) practices in Ramsar sites and in areas that are liable to impact on Ramsar sites and other wetlands so as to prevent damage to resident fish stocks and to the aquatic environment, applying the provisions of the 1997 FAO Technical Guidelines for Responsible Fisheries - Aquaculture Development and the 2000 Bangkok Declaration and Strategy for Aquaculture Development (Network of Aquaculture Centres in Asia-Pacific (NACA)/FAO)), and taking into account the draft Principles for a Code of Conduct for the Management and Sustainable Use of Mangrove Ecosystems;

26. STRONGLY URGES each Contracting Party to enforce existing policies and legislation to suspend any promotion, creation of new facilities, or expansion of unsustainable aquaculture activities harmful to coastal wetlands, in line with Resolution VII.21 on intertidal wetlands;

27. REQUESTS Contracting Parties with mangrove ecosystems in their territories, taking into account the provisions of Resolution VIII.32, to review and, as appropriate, to modify any of their national policies and strategies that have or could have harmful effects on these ecosystems, and to implement measures to protect and restore the services of these ecosystems for human populations, recognizing their rights, uses and traditional customs and the maintenance of biodiversity, and to cooperate at the international level to agree regional and global strategies for the maintenance of these ecosystems;

28. STRONGLY URGES each Contracting Party to review its policies, laws and programmes for regulating the import of fish for aquaculture and the aquarium trade to avoid introduction of invasive alien species, and to undertake the necessary measures to

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prevent the introduction or spread of known invasive fish species, in line with Resolution VIII.18;

29. REQUESTS the Ramsar Secretariat to draw attention to the important role of wetlands in fish conservation and sustainable use through its ongoing CEPA activities, and in particular through future World Wetlands Day celebrations and events;

30. REQUESTS the Secretary General to pursue appropriate partnerships with expert bodies or organizations, such as The WorldFish Center and FAO, that are concerned with fish conservation and sustainable use so as to further expand and gain prominence for the role of the Ramsar Convention in this area; and

31. REQUESTS the STRP to consider ways and means of elaborating the annex to this Resolution, taking into account the findings of the Millennium Ecosystem Assessment (MA), the Comprehensive Assessment of Water Management in Agriculture (CA), and other relevant assessments, in order to provide further guidance for Contracting Parties on wetlands and sustainable fisheries.

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## Annex

### **Issues and recommendations for Contracting Parties concerning the management of sustainable fisheries in Ramsar sites and other wetlands**

Note: these recommendations cover issues in both inland and coastal fisheries, but do not directly address off-shore marine fisheries.

#### **Issue 1: Aquaculture**

- Aquaculture is practised in many Ramsar sites and in the waters adjacent to such sites, and is sensitive to social, economic and technological changes that can impact on the nature of associated wetlands. Aquaculture also carries with it many risks to the environment and to fish, and conversion of, for example, natural mangrove systems to aquaculture can greatly reduce the total economic value of the ecosystem services to people.

Aquaculture (pond and cage culture) practices in Ramsar sites or in areas that are liable to impact on Ramsar sites should be carefully controlled. Specifically, governments should enforce relevant national legislation, apply the provisions of the FAO Technical Guidelines for Responsible Fisheries - Aquaculture Development (FAO 1997), the Bangkok Declaration and Strategy for Aquaculture Development (NACA/FAO 2000), and the Principles for a Code of Conduct for the Management and Sustainable Use of Mangrove Ecosystems.

#### **Issue 2: Rice cultivation**

- Rice cultivation is practised at many Ramsar sites, and there are opportunities to improve the total yield of such areas by "rice-fish" systems in these and other wetlands cultivated for rice.

The significance for fisheries of rice cultivation within Ramsar sites should be further explored and documented and a more efficient combination of "rice-fish" management practices promoted.

#### **Issue 3: Management of fisheries**

- Fisheries management based on central governmental control has generally failed to halt the degradation of fished stocks. Co-management systems are an

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alternative that allows better participation of stakeholders in the management process.

Participatory management in appropriate sites should be encouraged and facilitated by revising any existing laws and regulations that exclude it, supporting research, and establishing suitable management systems at international, national and basin levels.

- Co-management systems are frequently difficult to establish because of social traditions, land and water use practices, and legislation.

Fisheries legislation and regulations should enable stakeholders to participate in formulation of policies for the management of the resource and ensure that the benefits of the fishery are distributed equitably among stakeholders.

- Growing numbers of people with access to a fishery can mean that the resource is increasingly overfished.

Measures should be adopted to control access to fisheries of Ramsar sites and other wetlands where they are not already in place.

- By-catch of globally-threatened and other wetland-dependent species in fishing gear (such as turtles and waterbirds in gill-nets) continues to threaten the survival of these species.

Measures should be put in place to minimize or prevent by-catch through the use of appropriate fishery techniques.

- Ecologically damaging fishing gear continues to be used in many fisheries.

Ecologically damaging fishing gear, including explosives, poisons, electric fishing gear, cross channel barrages that interrupt migration, and dragged gear that destroys the structure and faunal integrity of the bottom, should be banned in Ramsar sites (as everywhere) and such bans enforced.

#### **Issue 4: Management of the fish**

- Many inland and coastal fisheries rely increasingly on introductions of exotic fish species and regular stocking programmes. Both these practices involve risk and should be carried out with caution.

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A code similar to the ICES Code of Practice on the Introductions and Transfers of Marine Organisms and the GEF/UNDP/IMO International Convention for the Control and Management of Ships' Ballast Water and Sediments should be applied rigorously so that Ramsar sites are not placed at risk through unplanned introductions of aquatic species.

Reasonable practices should be adopted to reduce the risks from unregulated stocking programmes.

#### **Issue 5: Sustainable management of wetland ecosystems for fish**

- There is a general decline in the environmental health of most inland and coastal ecosystems caused by the impacts of human uses, declines found by the Millennium Ecosystem Assessment (MA) to be already more severe and to be occurring at faster rates in these ecosystems than in others. An area of major concern is the increasing withdrawal of water from inland systems that is affecting the functioning of rivers and the hydrological balance of lakes and coastal waters.

Environmental flow assessments in all rivers and associated wetlands that are threatened by flow-modifying activities such as the construction of dams, levee-ing of river channels, and water abstractions should include specific attention to fish and fisheries related aspects (see also Resolution VIII.1 and [COP9 DR1 Annex C]).

Strategies for the mitigation of negative impacts on the environment from the activities of other users of the aquatic resource should be formulated. Where such impacting uses have ceased, the possibility of rehabilitation of damaged ecosystems should be explored (with reference to COP8 Resolution VIII.16).

The establishment of formal conservation and harvest reserves within selected sites of importance to fisheries should be considered.

#### **Issue 6: Conflicts and multi-purpose use**

- A number of human uses compete with fisheries for water and aquatic environmental resources at Ramsar sites.



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Local, national and international mechanisms should be established whereby allocation of essential resources for the protection of fish and fisheries are negotiated among all users of the resource. Similar mechanisms are needed for the resolution of conflicts between competing uses.

### **Issue 7: Increasing awareness of the importance of wetland management for fisheries**

- There is an urgent need to ensure wider and better understanding of the importance of maintaining both coastal and inland wetlands for the benefit of fisheries maintenance.

Training programmes should be carried out under the Convention's programme on communication, education and public awareness (CEPA) to promote mutual understanding of the problems of the diverse sectors involved with wetland management and conservation including fisheries.

- Coastal and inland water fishers often operate at a small scale and need support.

Self-motivated initiatives such as community outreach, wildlife monitoring, codes of conduct, certification and education, and awareness-raising should be fostered within fishing communities that are fishing within, adjacent to or in ways which impact upon Ramsar sites.

### **Issue 8: Enhancing international cooperation**

- Maintenance of fisheries in shared wetlands and seas needs the countries concerned to develop enhanced collaboration.

Countries sharing rivers, coastal lagoons, seas and lakes with significant fisheries should seek to establish common mechanisms for research, information sharing and management of their fish and fisheries. If possible such mechanisms should be incorporated into existing institutions, but where no such institutions exist, measures should be taken to establish them.

### **Issue 9: Applying existing international agreements**

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- The application of a number of international agreements and existing guidance can help to ensure that fisheries in or affecting Ramsar sites and other wetlands are sustainable.

The *Code of Conduct for Responsible Fisheries* (FAO, 1995) and its various Technical Guidelines should be taken as the guiding principles in regulating marine and freshwater fisheries and aquaculture. Technical guidelines cover: 1. Fishing operations (1996); 2. Precautionary approach to capture fisheries and species introductions (1996); 3. Integration of fisheries into coastal area management (1996); 4. Fisheries management (1997); 5. Aquaculture development (1997); 5. (supplement 1) Aquaculture development: good aquaculture feed manufacturing practice (2001); 6. Inland Fisheries (1997); 7. Indicators for sustainable development of marine capture fisheries. (1999); 8. Responsible fish utilization. (1998); 9. Implementation of the International Plan of Action to prevent, deter and eliminate illegal, unreported and unregulated fishing (2002), and 10. the ecosystem-approach to fisheries.

Management strategies for the conservation of fisheries and fish species especially in relation to Ramsar sites should take into account any endangered species listed in Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), in accordance with the application of Criterion 2 of the Ramsar *Strategic Framework and Guidelines for the future development of the List of Wetlands of International Importance* (Resolution VII.11)[, as amended by COP9 DR1 - Annex B].

#### **Issue 10: The status of fisheries in Ramsar sites**

- Information on most fisheries pursued in or affecting Ramsar sites, as supplied in Ramsar Information Sheets, is sparse and generally qualitative. However, the information which does exist confirms that fisheries are practised in many Ramsar sites or in the larger wetland ecosystems with which Ramsar sites are associated. It is clear that Ramsar sites and their associated systems also provide employment to many commercial fishers and subsistence fishers and collectors. Available evidence suggests that inland and small-scale coastal fisheries, including of the types that presently dominate in Ramsar sites, have declined due to habitat modification, overfishing and other human activities [[note 1](#)].

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National and regional programmes for the systematic collection of fisheries data at Ramsar sites and associated areas should be initiated or reinforced. As a minimum this should include data on weight and size of catch, numbers and effort of fishermen, and social and economic aspects of the fishery.

### **Issue 11: Coverage of the Ramsar site network for fish**

- Since Criteria 7 and 8 for the designation of Ramsar sites for fish were adopted at the 6th Conference of the Contracting Parties (1996), 264 Ramsar sites have been designated using these Criteria (as of 21 April 2005), although these occur in only 77 of the current 145 Contracting Parties. It is clear that for fish the Ramsar site network is not yet the coherent and comprehensive national and international network envisaged by the 1999 Strategic Framework. Some systems lack representative sites to cover essential habitats for some important fish species.

Additional Ramsar sites should be designated, especially by those Contracting Parties that have not yet designated Ramsar sites under Criteria 7 and/or 8, to complete the global network of sites of international importance for their fish populations.

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Note 1. A key finding of the Millennium Ecosystem Assessment (MA) is that: "The use of two ecosystem services - capture fisheries and freshwater - is now well beyond levels that can be sustained even at current demands, much less future ones. At least one quarter of important commercial fish stocks are overharvested (high certainty). Humans increased the capture of marine fish up until the 1980s by harvesting an ever-growing fraction of the available resource. Marine fish landings are now declining as a result of the overexploitation of this resource. Inland water fisheries, which are particularly important in providing high-quality diets for poor people, have also declined due to habitat modification, overfishing, and water withdrawals." (Millennium Ecosystem Assessment, 2005. *Ecosystems and Human Well-being: Synthesis*. Island Press, Washington, DC).

Source:

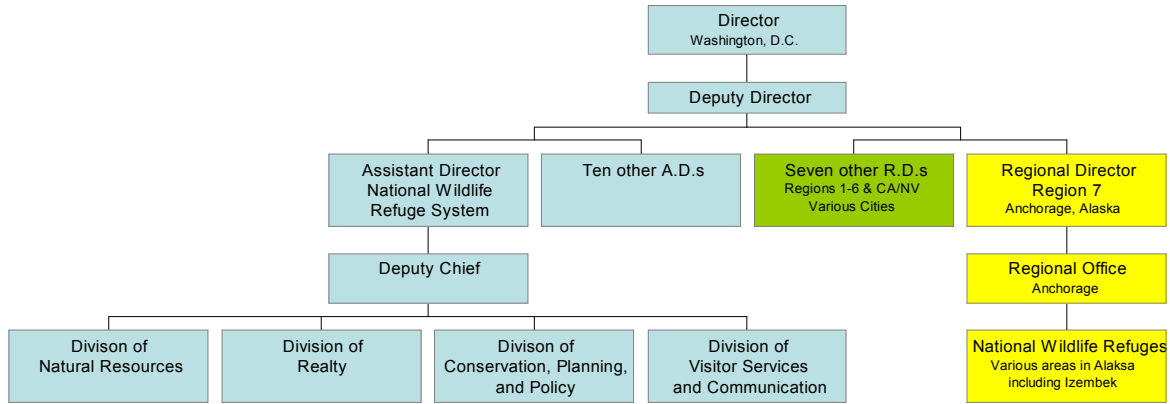
The Ramsar Convention on Wetlands. "The Conservation and Sustainable Use of Fish Resources." The Ramsar Convention on Wetlands. 6 July 2005. 4 Dec. 2006. <[http://www.ramsar.org/cop9/cop9\\_dr04\\_e.htm](http://www.ramsar.org/cop9/cop9_dr04_e.htm)>.

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**Appendix II.** USFWS organizational chart, Salary Tables, and general job descriptions.

**USFS Organizational Structure**

United States Fish and Wildlife Service



*Note:* National organizational structure of the Fish and Wildlife Service. Blue boxes indicate that the positions and divisions are located in Washington, D.C., the green box indicates that the offices are located in various regions throughout the U.S., and yellow boxes indicate that the positions and offices are located in Alaska.

**US General pay scale<sup>19</sup>**

Incorporating the 2.10% General Schedule Increase  
Effective January 2006  
Annual Rates by Grade and Step

Grade	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7	Step 8	Step 9	Step 10	WGA
1	16,352	16,898	17,442	17,983	18,527	18,847	19,383	19,925	19,947	20,450	varies
2	18,385	18,822	19,431	19,947	20,169	20,762	21,355	21,948	22,541	23,124	varies
3	20,060	20,729	21,398	22,067	22,736	23,405	24,074	24,743	25,412	26,081	669
4	22,519	23,270	24,021	24,772	25,523	26,274	27,025	27,776	28,527	29,278	751
5	25,295	26,135	26,975	27,815	28,655	29,495	30,335	31,175	32,015	32,855	840
6	28,085	29,021	29,957	30,893	31,829	32,765	33,701	34,637	35,573	36,509	936
7	31,209	32,249	33,289	34,329	35,369	36,409	37,449	38,489	39,529	40,569	1040
8	34,563	35,715	36,867	38,019	39,171	40,323	41,475	42,627	43,779	44,931	1152
9	38,175	39,448	40,721	41,994	43,267	44,540	45,813	47,086	48,359	49,632	1273
10	42,040	43,441	44,842	46,243	47,644	49,045	50,446	51,847	53,248	54,649	1401
11	46,189	47,729	49,269	50,809	52,349	53,889	55,429	56,969	58,509	60,049	1540
12	55,360	57,205	59,050	60,895	62,740	64,585	66,430	68,275	70,120	71,965	1845
13	65,832	68,026	70,220	72,414	74,608	76,802	78,996	81,190	83,384	85,578	2194
14	77,793	80,386	82,979	85,572	88,165	90,758	93,351	95,944	98,537	101,130	2593
15	91,507	94,557	97,607	100,657	103,707	106,757	109,807	112,857	115,907	118,957	3050

WGA = Within Grade Amounts

**Description of U.S. Fish and Wildlife Service Employees (from the USFWS website)<sup>19</sup>**

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*Refuge Managers.* As stewards of our National Wildlife Refuge System, Refuge Managers are experts in wildlife and habitat protection and restoration. They use the best science and technology to monitor and care for wildlife, use a range of land management techniques to ensure suitable habitat, and provide opportunities for wildlife-dependent recreation for refuge visitors. They work with their neighbors, community organizations, and other partners to represent the interests of wildlife in land-use planning and development.

*Wildlife Biologists.* Wildlife Biologists carry out a wide variety of duties associated with conserving fish and wildlife species, including population surveys, habitat restoration, reintroduction of endangered species, and evaluation of the impacts of Federal projects. A few specific examples of the work they do is to monitor the status and trends of waterfowl migrating across North America, reconstruct wildlife habitats such as wetlands and tallgrass prairie lands, use aerial and ground surveys to examine animal populations, and work with conservation officials in the states and around the world to track animals of mutual management concern, including polar bears, walrus, and seals.

*Fishery Biologists.* Like Wildlife Biologists, Fishery Biologists are also involved in a full range of conservation activities. For example, they restore imperiled aquatic species, remove barriers to fish passage, prevent and control aquatic nuisance species, monitor fish populations and health, develop fishery management plans, raise fish through captive propagation, and other activities in support of a wide variety of fish and other aquatic resources.

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**Appendix III. Line-Item Budget**

**Eelgrass Monitoring**

**Personnel Services**

Salaries	\$11,057.90
Fringe Benefits	\$2,764.48

**Total Personnel Services  
Cost** **\$13,822.38**

**Other Than Personnel Services**

Contracts	\$1,500.00
Training	\$100.00
Supplies	\$28,000.00
Travel	\$1,936.00
Office Expenses	\$330.34

**Total OTPS Cost** **\$31,866.34**

**Total Operation Cost** **\$45,688.71**

*Line-Item Budget*

**Salinity Testing**

**Personnel Services**

Salaries	\$10,673.01
Fringe Benefits	\$2,668.25

**Total Personnel Services  
Cost** **\$13,341.26**

**Other Than Personnel Services**

Training	\$100.00
Supplies	\$2,100.00
Travel	\$450.00
Office Expenses	\$330.34

**Total OTPS Cost** **\$2,980.34**

**Total Operation Cost** **\$16,321.60**

*Line-Item Budget*

**Weir Monitoring**

**Personnel Services**

Salaries	\$27,121.00
Fringe Benefits	\$6,780.25

**Total Personnel Services  
Cost** **\$33,901.25**

**Other Than Personnel Services**

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Training	\$400.00
Supplies	\$4,001.00
Travel	\$2,573.70
Office Expenses	\$330.34
<b>Total OTPS Cost</b>	<b>\$7,305.04</b>
<b>Total Operation Cost</b>	<b>\$41,206.29</b>

*Line-Item Budget*

**Create Database**

**Personnel Services**

Salaries	\$19,086.72
Fringe Benefits	\$4,771.68

**Total Personnel Services Cost** **\$23,858.40**

**Other Than Personnel Services**

Supplies	\$1,729.00
Travel	\$818.00
Office Expenses	\$1,651.68

**Total OTPS Cost** **\$4,198.68**

*Line-Item Budget*

**Increase Signage**

**Personnel Services**

Salaries	\$2,428.78
Fringe Benefits	\$607.20

**Total Personnel Services Cost** **\$3,035.98**

**Other Than Personnel Services**

Contracts	\$1,540.00
Travel	\$75.00
Office Expenses	\$330.34

**Total OTPS Cost** **\$1,945.34**

**Total Operation Cost** **\$4,981.31**

*Line-Item Budget*

**Update Website**

**Personnel Services**

Salaries	\$4,681.35
Fringe Benefits	\$1,170.34

**Total Personnel Services Cost** **\$5,851.69**



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**Other Than Personnel Services**

Supplies	\$999.00
Office Expenses	\$1,651.68
<b>Total OTPS Cost</b>	<b>\$2,650.68</b>

<b>Total Operation Cost</b>	<b>\$8,502.37</b>
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**Line-Item Budget****Line- item Budget****Personnel Services**

Salaries	\$84,783.97
Fringe Benefits	\$21,195.99

<b>Total Personnel Services Cost</b>	<b>\$105,979.96</b>
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**Other Than Personnel Services**

Contracts	\$3,040.00
Training	\$600.00
Supplies	\$36,829.00
Travel	\$6,152.70
Office Expenses	\$8,258.40

<b>Total OTPS Cost</b>	<b>\$54,880.10</b>
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<b>Total Operation Cost</b>	<b>\$160,860.06</b>
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**Grants**

Fisheries Resource Monitoring	\$35,000.00
Parteners for Fisheries Monitoring	\$11,000.00
North American Wetlands Conservation	\$80,000.00
Coastal Conservation	\$35,000.00

<b>Total Grants</b>	<b>\$161,000.00</b>
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<b>Total Program Budget</b>	<b>\$160,860.06</b>
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**Appendix IV – Grant Breakdown by Provider**

<b>Grants</b>		
Fisheries Resource Monitoring		\$35,000.00
Partners for Fisheries Monitoring		\$11,000.00
North American Wetlands Conservation		\$80,000.00
Coastal Conservation		\$35,000.00
	<b>Total Grants</b>	<b>\$161,000.00</b>

**Appendix IV. Criteria for identifying Wetlands of International Importance, guidelines for their application, and long-term targets**

55. In this Section of the Strategic Framework for the Ramsar List, the Criteria for designating sites are presented, along with the long-term target the Convention has agreed for each. For each Criterion, guidelines are also provided to assist Contracting Parties in taking a systematic approach to identifying their priority sites for designation. These guidelines should be considered in conjunction with the more general guidelines given in Section IV. In addition, Appendix E provides a Glossary of the terms used in the Criteria, long-term targets and guidelines presented in the following pages.

**Criteria for the designation of Wetlands of International Importance**

<p><b>Group A of the criteria</b></p> <p>Sites containing representative, rare or unique wetland types</p>		<p><b>Criterion 1:</b> A wetland should be considered internationally important if it contains a representative, rare, or unique example of a natural or near-natural wetland type found within the appropriate biogeographic region.</p>
<p><b>Group B of the criteria</b></p> <p>Sites of international importance for conserving biodiversity</p>	<p>Criteria based on species and ecological communities</p>	<p><b>Criterion 2:</b> A wetland should be considered internationally important if it supports vulnerable, endangered, or critically endangered species or threatened ecological communities.</p>
<p><b>Criterion 3:</b> A wetland should be considered internationally important if it supports populations of plant and/or animal species important for maintaining the biological diversity of a particular biogeographic region.</p>		
<p><b>Criterion 4:</b> A wetland should be considered internationally important if it supports plant and/or animal species at a critical stage in their life cycles, or provides refuge during adverse conditions.</p>		

	Specific criteria based on waterbirds	<b>Criterion 5:</b> A wetland should be considered internationally important if it regularly supports 20,000 or more waterbirds.
		<b>Criterion 6:</b> A wetland should be considered internationally important if it regularly supports 1% of the individuals in a population of one species or subspecies of waterbird.
	Specific criteria based on fish	<b>Criterion 7:</b> A wetland should be considered internationally important if it supports a significant proportion of indigenous fish subspecies, species or families, life-history stages, species interactions and/or populations that are representative of wetland benefits and/or values and thereby contributes to global biological diversity.
		<b>Criterion 8:</b> A wetland should be considered internationally important if it is an important source of food for fishes, spawning ground, nursery and/or migration path on which fish stocks, either within the wetland or elsewhere, depend.
	Specific criteria based on other taxa	<b>Criterion 9:</b> A wetland should be considered internationally important if it regularly supports 1% of the individuals in a population of one species or subspecies of wetland-dependent non-avian animal species.

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## **Appendix VI Project Timeframe**

### **1. ADMINISTRATION**

#### **Grants**

Write Proposals for FishMAP funding from Fisheries Resource Monitoring, Partners for Fisheries Monitoring, North American Wetlands Conservation, and Coastal Conservation Grants (Deputy Refuge Manager)

- Nov. 15, 2006 – Nov. 20, 2006

Edit Grant Proposals (Refuge Manager)

- Nov. 21, 2006 – Nov. 24, 2006

Submit Grant Proposals (Deputy Refuge Manager)

- Nov. 27, 2006

Receive Grant Funding

- Jan. 15, 2007

#### **Staffing**

Post Job Listings and Accept Applications for the Positions of Fisheries Biologist, Field Technician/Database Manager, and Assistant Technician (Refuge Manager)

- Dec. 4, 2006 – Jan. 15, 2007

Evaluate Applications (Refuge Manager)

- Jan. 16, 2007 – Jan. 31, 2007

Interview Candidates (Refuge Manager)

- Feb. 1, 2007 – Feb. 17, 2007

Final Staffing Decisions (Refuge Manager)

- Feb. 19, 2007 – Mar. 2, 2007

#### **Contracts**

Draft and submit the Request for Proposals (Refuge Manager and Deputy Refuge Manager)

- Jan 16, 2007- Jan. 31, 2007

Get Bids from Contractors (Refuge Manager)

- Jan. 16, 2007 – Feb. 2, 2007

Evaluate Bids and award Contracts (Refuge Manager)

- Feb. 5, 2007 – Feb. 17, 2007

### **2. STAFF AND COORDINATION**

Orientation and Training for New Staff (Fisheries Biologist and Technician)

- Apr. 2, 2007 – Apr. 13, 2007

Seasonal Assistant on Location

- June 1, 2007 – Aug. 31, 2007

Monthly Meeting with All Staff

- May, 25, 2007
- June 22, 2007
- July 27, 2007
- August 24, 2007

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- Sep. 28, 2007
  - Oct. 26, 2007

### 3. IZEMBEK LAGOON PROJECT

Create Salinity Database (Technician)

- Apr. 16, 2007 – Apr. 20, 2007

Select Monitoring Sites for Salinity and Eelgrass Monitoring (Fisheries Biologist)

- Apr. 23, 2007 – May 4, 2007

Monitor for Salinity and Eelgrass - Data Collection, Data Entry, Data Analysis  
(University of Alaska Contractor and Fisheries Biologist)

- May 7, 2007 – Sep. 7, 2007

Aerial Monitoring

- May 9, 2007
- Sep. 5, 2007

### 4. MORTENSEN'S CREEK PROJECT

Create Fisheries Database (Technician)

- Apr. 16, 2007 – Apr. 20, 2007

Build Weir Monitor (Technician and Fisheries Biologist)

- Apr. 23, 2007 – May 4, 2007

Monitor for Fish - Data Collection, Data Entry, Data Analysis (Fisheries Biologist)

- May 7, 2007 – Sep. 7, 2007

Fisheries Biologist Travels to the Alaksen Wildlife Refuge (Fisheries Biologist)

- Sep. 24, 2007 – Sep. 28, 2007

### 5. PROMOTING IZEMBEK PROJECT

#### **Signs**

Develop Information for Signs (Deputy Refuge Manager)

- Apr. 16, 2007 – Apr. 20, 2007

Design Signs (Contract with Student Graphic Designer)

- Apr. 23, 2007 – Apr. 27, 2007

Produce Signs (Contract with Sign Producers)

- Apr. 30, 2007 – May. 4, 2007

Install Signs (Volunteers)

- June 18, 2007 – June 22, 2007

Check Sign Installation

- June 29, 2007

Sign Maintenance (Maintenance Mechanic)

- July, 20, 2007
- Aug. 17, 2007
- Sep. 21, 2007

Analyze Survey Results

- Sep. 10, 2007 – Sep. 14, 2007

#### **Website**

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Develop Information for Website (Fisheries Biologist)

- Apr. 16, 2007 – Apr. 20, 2007

Update Website (USFWS Webmaster)

- Apr. 23, 2007 – Apr. 27, 2007

Check Website Hits (Technician)

- May 15, 2007
- June, 19, 2007
- July 17, 2007
- Aug. 21, 2007
- Sep. 18, 2007
- Oct. 16, 2007

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**Appendix VI. Ramsar sites in the U.S.**

	Ramsar site (NWR = National Wildlife Refuge)	Location	Date of designation
1	Izembek National Wildlife Refuge (NWR)	Alaska	18-Dec-86
2	Forsythe NWR	New Jersey	18-Dec-86
3	Okefenokee NWR	Georgia and Florida	18-Dec-86
4	Ash Meadows NWR	Nevada	18-Dec-86
5	Everglades National Park	Florida	4-Jun-87
6	Chesapeake Bay Estuarine Complex	Maryland and Virginia	4-Jun-87
7	Cheyenne Bottoms	Kansas	19-Oct-88
8	Cache-Lower White Rivers	Arkansas	21-Nov-89
9	Horicon Marsh	Wisconsin	4-Dec-90
10	Catahoula Lake	Louisiana	18-Jun-91
11	Delaware Bay Estuary	Delaware	20-May-92
12	Pelican Island NWR	Florida	14-Mar-93
13	Caddo Lake	Texas	23-Oct-93
14	Connecticut River Estuary	Connecticut	14-Oct-94
15	Cache River-Cypress Creek Wetlands	Illinois	1-Nov-94
16	Sand Lake NWR	South Dakota	3-Aug-98
17	Bolinas Lagoon	California	11-Sep-98
18	Quivira NWR	Kansas	12-Feb-02
19	Tomales Bay	California	21-Oct-02
20	Tijuana River National Estuarine Research Reserve	California	2-Feb-05
21	Grassland Ecological Area	California	2-Feb-05
22	Kawainui and Hamakua Marsh Complex	Hawaii	2-Feb-05

Source:

U.S. National Ramsar Committee. U.S. National Ramsar Committee. 2006. 1 Dec. 2006  
<<http://www.fws.gov/international/ramsar/usprofiles.htm>>.



**9th Meeting of the Conference of the Parties to the  
Convention on Wetlands (Ramsar, Iran, 1971)**

*“Wetlands and water: supporting life, sustaining livelihoods”*

Kampala, Uganda, 8-15 November 2005

**Resolution IX.4**

**The Ramsar Convention and the conservation and  
sustainable use of fish resources**

1. RECOGNIZING the important role that inland, coastal and near-shore marine wetlands play in supporting fish populations and fisheries;
2. CONSCIOUS that fishing is of great social, cultural and economic importance throughout the world;
3. RECOGNIZING that fish are a vital source of food and income for millions of people, which can assist in the further reduction of poverty, and CONCERNED that the Millennium Ecosystem Assessment (MA) has reported that fish yields in many parts of the world are declining due to unsustainable harvest, habitat degradation, and loss of fish spawning and nursery grounds, as well as feeding and refuge areas;
4. CONCERNED by the loss of fish species and the increasing number of fish species recognized in the IUCN Red List as globally threatened, and AWARE of the important role that some Ramsar sites play in the conservation of endangered fish fauna;
5. RECALLING the relevance of the guidance adopted by the Convention on integrating wetland conservation and wise use into river basin management (Resolution VII.18) and coastal zone management (Resolution VIII.4) to securing the integrated management of wetland ecosystems upon which fish and fisheries depend;
6. ALSO RECALLING that in Resolution VIII.2 the Conference of the Parties encouraged "Contracting Parties, wherever possible and appropriate, to take the necessary steps in order to maintain the migration access for indigenous fish and other species past dams";
7. COMMENDING those Parties that have taken actions to conserve or restore native fish populations and their habitats, such as through habitat restoration, the provision of

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fish passages around in-stream infrastructure, the control of invasive alien species competitors, and/or the reduction of water pollution impacts;

8. NOTING the comparative ecosystem benefits gained from supplying food from sustainable fisheries in alleviating agricultural pressure on land and in reducing water pollution;

9. ALSO NOTING the widespread growth in aquaculture, its potential benefits and environmental costs, and the need for careful planning and management to avoid negative impacts upon native fish stocks and wetland ecosystems;

10. AWARE of the adoption by the UN Food and Agriculture Organisation (FAO) of the *Code of conduct for responsible fisheries* (1995) and its subsequent associated range of Technical Guidelines, and the recognition that these give to the need to promote sustainable use of fish resources and to mitigate impacts of aquaculture practices;

11. ALSO AWARE of the ongoing work of the Comprehensive Assessment of Water Management in Agriculture (CA) led by the International Water Management Institute (IWMI) and its relevance to issues of wetlands, capture fisheries and aquaculture;

12. NOTING the ongoing preparation of the *Principles for a Code of Conduct for the Management and Sustainable Use of Mangrove Ecosystems*, including the review of the draft Principles at Ramsar COP9 regional preparatory meetings for Africa, the Americas, and Asia, and RECOGNIZING the importance of reflecting several of these principles in national legislation and policies;

13. RECALLING that Action 1.2.6 of the Ramsar Strategic Plan 2003-2008 calls for an assessment of "the contribution of Ramsar sites and other wetlands to the maintenance of fisheries, including utilizing information available from the Millennium Ecosystem Assessment (MA) and other assessment programmes, and [recommendation of] sustainable management practices which can contribute to the WSSD target of, where possible by 2015, maintaining or restoring depleted fish stocks to levels that can produce the maximum sustainable yield";

14. RECOGNIZING that coral reefs are the most complex, species-rich and productive of marine ecosystems, covering less than 1% of the ocean's area yet home to one-third of all marine fish species, and that coral reef fisheries are estimated to yield 6 million metric tons of fish catch annually, with one-quarter of the total worldwide fish production being in developing countries with coral reefs;

15. AWARE of the WSSD Plan of Implementation actions concerning the establishment of marine protected areas, the CBD COP7 Decision VII/5 on marine and coastal biological diversity, and the recent work of the FAO Committee on Fisheries (CoFi) on the role of marine protected areas (MPAs) in fisheries management, and NOTING the

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urgent need to address the under-representation of protected areas in marine and coastal habitats and in inland waters;

16. NOTING the role played by The WorldFish Center as advocates and technical advisors in relation to fish resources and sustainable fisheries; and THANKING The WorldFish Centre, IUCN and WWF, working with the Scientific and Technical Review Panel, for their financial support for the implementation of Strategic Plan Action 1.2.6 through the preparation of a 'Review of Ramsar Sites and Fisheries Maintenance' to be published as a *Ramsar Technical Report*, and the outline issues and recommendations concerning wetlands and the conservation and sustainable use of fish resources annexed to this Resolution; and

17. ALSO NOTING that Wetlands International and IUCN-The World Conservation Union have established a Freshwater Fish Specialist Group that will provide advice on priority actions for freshwater fish conservation to Contracting Parties, river basin organizations and others;

#### THE CONFERENCE OF THE CONTRACTING PARTIES

18. ENCOURAGES Contracting Parties and others to take into account the recommendations annexed to this Resolution, adapted as appropriate for national and local conditions, when addressing issues of the sustainable use of fish resources in relation to the conservation and wise use of Ramsar sites and other wetlands;

19. URGES Contracting Parties to review their policy frameworks and institutional arrangements, in line with Resolutions VII.6 on National Wetland Policies and VII.7 on reviewing laws and legislation, so as to ensure that fisheries management authorities and those involved with conserving and/or managing aquatic biodiversity are aware of, complement and support national, subnational and local efforts to implement the Convention;

20. REQUESTS fisheries authorities responsible for managing fisheries within, adjacent to, or associated with Ramsar sites to ensure that the ecological character of the Ramsar site (or sites) is maintained;

21. URGES Contracting Parties and others to use the habitat and species conservation provisions of the Convention to support the introduction and/or continuance of spatial management approaches for fisheries, particularly in coastal and marine fisheries, and ALSO URGES the Ramsar Secretariat to work with other conventions and instruments concerned with the conservation of biodiversity and the management of natural resources, in order to promote the synergy and alignment of spatial planning and management approaches that benefit the conservation and sustainable management of fish populations and recognition of the contribution this makes towards meeting WSSD goals and Millennium Development Goals (MDGs);

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22. REQUESTS those responsible for the management of Ramsar sites to incorporate into their management planning processes, in line with Resolution VIII.14 on management planning, measures to maintain the ecological services of wetlands in support of ecologically sustainable fisheries;

23. REQUESTS Contracting Parties to review and, where necessary, enhance national and regional programmes for the systematic collection of data on fisheries, including artisanal fisheries, and data on aquaculture, of relevance to Ramsar sites and associated areas;

24. URGES Contracting Parties to take the necessary steps within their frameworks for integrated river basin and coastal zone management to maintain or reinstate fish migration pathways, to reduce the impacts of point source and diffuse pollution in all its forms, to establish and implement environmental flow allocations supporting the conservation of fish, to protect critical spawning and nursery grounds, and to restore relevant habitats where these have become degraded, taking into account the guidance adopted in Resolutions VIII.1 on water allocation, VIII.4 on ICZM, and VIII.32 on mangrove ecosystems;

25. URGES Contracting Parties carefully to control aquaculture (pond and cage culture) practices in Ramsar sites and in areas that are liable to impact on Ramsar sites and other wetlands so as to prevent damage to resident fish stocks and to the aquatic environment, applying the provisions of the 1997 FAO Technical Guidelines for Responsible Fisheries - Aquaculture Development and the 2000 Bangkok Declaration and Strategy for Aquaculture Development (Network of Aquaculture Centres in Asia-Pacific (NACA)/FAO)), and taking into account the draft Principles for a Code of Conduct for the Management and Sustainable Use of Mangrove Ecosystems;

26. STRONGLY URGES each Contracting Party to enforce existing policies and legislation to suspend any promotion, creation of new facilities, or expansion of unsustainable aquaculture activities harmful to coastal wetlands, in line with Resolution VII.21 on intertidal wetlands;

27. REQUESTS Contracting Parties with mangrove ecosystems in their territories, taking into account the provisions of Resolution VIII.32, to review and, as appropriate, to modify any of their national policies and strategies that have or could have harmful effects on these ecosystems, and to implement measures to protect and restore the services of these ecosystems for human populations, recognizing their rights, uses and traditional customs and the maintenance of biodiversity, and to cooperate at the international level to agree regional and global strategies for the maintenance of these ecosystems;

28. STRONGLY URGES each Contracting Party to review its policies, laws and programmes for regulating the import of fish for aquaculture and the aquarium trade to avoid introduction of invasive alien species, and to undertake the necessary measures to

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prevent the introduction or spread of known invasive fish species, in line with Resolution VIII.18;

29. REQUESTS the Ramsar Secretariat to draw attention to the important role of wetlands in fish conservation and sustainable use through its ongoing CEPA activities, and in particular through future World Wetlands Day celebrations and events;

30. REQUESTS the Secretary General to pursue appropriate partnerships with expert bodies or organizations, such as The WorldFish Center and FAO, that are concerned with fish conservation and sustainable use so as to further expand and gain prominence for the role of the Ramsar Convention in this area; and

31. REQUESTS the STRP to consider ways and means of elaborating the annex to this Resolution, taking into account the findings of the Millennium Ecosystem Assessment (MA), the Comprehensive Assessment of Water Management in Agriculture (CA), and other relevant assessments, in order to provide further guidance for Contracting Parties on wetlands and sustainable fisheries.

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## Annex

### **Issues and recommendations for Contracting Parties concerning the management of sustainable fisheries in Ramsar sites and other wetlands**

Note: these recommendations cover issues in both inland and coastal fisheries, but do not directly address off-shore marine fisheries.

#### **Issue 1: Aquaculture**

- Aquaculture is practised in many Ramsar sites and in the waters adjacent to such sites, and is sensitive to social, economic and technological changes that can impact on the nature of associated wetlands. Aquaculture also carries with it many risks to the environment and to fish, and conversion of, for example, natural mangrove systems to aquaculture can greatly reduce the total economic value of the ecosystem services to people.

Aquaculture (pond and cage culture) practices in Ramsar sites or in areas that are liable to impact on Ramsar sites should be carefully controlled. Specifically, governments should enforce relevant national legislation, apply the provisions of the FAO Technical Guidelines for Responsible Fisheries - Aquaculture Development (FAO 1997), the Bangkok Declaration and Strategy for Aquaculture Development (NACA/FAO 2000), and the Principles for a Code of Conduct for the Management and Sustainable Use of Mangrove Ecosystems.

#### **Issue 2: Rice cultivation**

- Rice cultivation is practised at many Ramsar sites, and there are opportunities to improve the total yield of such areas by "rice-fish" systems in these and other wetlands cultivated for rice.

The significance for fisheries of rice cultivation within Ramsar sites should be further explored and documented and a more efficient combination of "rice-fish" management practices promoted.

#### **Issue 3: Management of fisheries**

- Fisheries management based on central governmental control has generally failed to halt the degradation of fished stocks. Co-management systems are an

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alternative that allows better participation of stakeholders in the management process.

Participatory management in appropriate sites should be encouraged and facilitated by revising any existing laws and regulations that exclude it, supporting research, and establishing suitable management systems at international, national and basin levels.

- Co-management systems are frequently difficult to establish because of social traditions, land and water use practices, and legislation.

Fisheries legislation and regulations should enable stakeholders to participate in formulation of policies for the management of the resource and ensure that the benefits of the fishery are distributed equitably among stakeholders.

- Growing numbers of people with access to a fishery can mean that the resource is increasingly overfished.

Measures should be adopted to control access to fisheries of Ramsar sites and other wetlands where they are not already in place.

- By-catch of globally-threatened and other wetland-dependent species in fishing gear (such as turtles and waterbirds in gill-nets) continues to threaten the survival of these species.

Measures should be put in place to minimize or prevent by-catch through the use of appropriate fishery techniques.

- Ecologically damaging fishing gear continues to be used in many fisheries.

Ecologically damaging fishing gear, including explosives, poisons, electric fishing gear, cross channel barrages that interrupt migration, and dragged gear that destroys the structure and faunal integrity of the bottom, should be banned in Ramsar sites (as everywhere) and such bans enforced.

#### **Issue 4: Management of the fish**

- Many inland and coastal fisheries rely increasingly on introductions of exotic fish species and regular stocking programmes. Both these practices involve risk and should be carried out with caution.

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A code similar to the ICES Code of Practice on the Introductions and Transfers of Marine Organisms and the GEF/UNDP/IMO International Convention for the Control and Management of Ships' Ballast Water and Sediments should be applied rigorously so that Ramsar sites are not placed at risk through unplanned introductions of aquatic species.

Reasonable practices should be adopted to reduce the risks from unregulated stocking programmes.

#### **Issue 5: Sustainable management of wetland ecosystems for fish**

- There is a general decline in the environmental health of most inland and coastal ecosystems caused by the impacts of human uses, declines found by the Millennium Ecosystem Assessment (MA) to be already more severe and to be occurring at faster rates in these ecosystems than in others. An area of major concern is the increasing withdrawal of water from inland systems that is affecting the functioning of rivers and the hydrological balance of lakes and coastal waters.

Environmental flow assessments in all rivers and associated wetlands that are threatened by flow-modifying activities such as the construction of dams, levee-ing of river channels, and water abstractions should include specific attention to fish and fisheries related aspects (see also Resolution VIII.1 and [COP9 DR1 Annex C]).

Strategies for the mitigation of negative impacts on the environment from the activities of other users of the aquatic resource should be formulated. Where such impacting uses have ceased, the possibility of rehabilitation of damaged ecosystems should be explored (with reference to COP8 Resolution VIII.16).

The establishment of formal conservation and harvest reserves within selected sites of importance to fisheries should be considered.

#### **Issue 6: Conflicts and multi-purpose use**

- A number of human uses compete with fisheries for water and aquatic environmental resources at Ramsar sites.



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Local, national and international mechanisms should be established whereby allocation of essential resources for the protection of fish and fisheries are negotiated among all users of the resource. Similar mechanisms are needed for the resolution of conflicts between competing uses.

### **Issue 7: Increasing awareness of the importance of wetland management for fisheries**

- There is an urgent need to ensure wider and better understanding of the importance of maintaining both coastal and inland wetlands for the benefit of fisheries maintenance.

Training programmes should be carried out under the Convention's programme on communication, education and public awareness (CEPA) to promote mutual understanding of the problems of the diverse sectors involved with wetland management and conservation including fisheries.

- Coastal and inland water fishers often operate at a small scale and need support.

Self-motivated initiatives such as community outreach, wildlife monitoring, codes of conduct, certification and education, and awareness-raising should be fostered within fishing communities that are fishing within, adjacent to or in ways which impact upon Ramsar sites.

### **Issue 8: Enhancing international cooperation**

- Maintenance of fisheries in shared wetlands and seas needs the countries concerned to develop enhanced collaboration.

Countries sharing rivers, coastal lagoons, seas and lakes with significant fisheries should seek to establish common mechanisms for research, information sharing and management of their fish and fisheries. If possible such mechanisms should be incorporated into existing institutions, but where no such institutions exist, measures should be taken to establish them.

### **Issue 9: Applying existing international agreements**

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- The application of a number of international agreements and existing guidance can help to ensure that fisheries in or affecting Ramsar sites and other wetlands are sustainable.

The *Code of Conduct for Responsible Fisheries* (FAO, 1995) and its various Technical Guidelines should be taken as the guiding principles in regulating marine and freshwater fisheries and aquaculture. Technical guidelines cover: 1. Fishing operations (1996); 2. Precautionary approach to capture fisheries and species introductions (1996); 3. Integration of fisheries into coastal area management (1996); 4. Fisheries management (1997); 5. Aquaculture development (1997); 5. (supplement 1) Aquaculture development: good aquaculture feed manufacturing practice (2001); 6. Inland Fisheries (1997); 7. Indicators for sustainable development of marine capture fisheries. (1999); 8. Responsible fish utilization. (1998); 9. Implementation of the International Plan of Action to prevent, deter and eliminate illegal, unreported and unregulated fishing (2002), and 10. the ecosystem-approach to fisheries.

Management strategies for the conservation of fisheries and fish species especially in relation to Ramsar sites should take into account any endangered species listed in Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), in accordance with the application of Criterion 2 of the Ramsar *Strategic Framework and Guidelines for the future development of the List of Wetlands of International Importance* (Resolution VII.11)[, as amended by COP9 DR1 - Annex B].

#### **Issue 10: The status of fisheries in Ramsar sites**

- Information on most fisheries pursued in or affecting Ramsar sites, as supplied in Ramsar Information Sheets, is sparse and generally qualitative. However, the information which does exist confirms that fisheries are practised in many Ramsar sites or in the larger wetland ecosystems with which Ramsar sites are associated. It is clear that Ramsar sites and their associated systems also provide employment to many commercial fishers and subsistence fishers and collectors. Available evidence suggests that inland and small-scale coastal fisheries, including of the types that presently dominate in Ramsar sites, have declined due to habitat modification, overfishing and other human activities [[note 1](#)].

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National and regional programmes for the systematic collection of fisheries data at Ramsar sites and associated areas should be initiated or reinforced. As a minimum this should include data on weight and size of catch, numbers and effort of fishermen, and social and economic aspects of the fishery.

### **Issue 11: Coverage of the Ramsar site network for fish**

- Since Criteria 7 and 8 for the designation of Ramsar sites for fish were adopted at the 6th Conference of the Contracting Parties (1996), 264 Ramsar sites have been designated using these Criteria (as of 21 April 2005), although these occur in only 77 of the current 145 Contracting Parties. It is clear that for fish the Ramsar site network is not yet the coherent and comprehensive national and international network envisaged by the 1999 Strategic Framework. Some systems lack representative sites to cover essential habitats for some important fish species.

Additional Ramsar sites should be designated, especially by those Contracting Parties that have not yet designated Ramsar sites under Criteria 7 and/or 8, to complete the global network of sites of international importance for their fish populations.

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Note 1. A key finding of the Millennium Ecosystem Assessment (MA) is that: "The use of two ecosystem services - capture fisheries and freshwater - is now well beyond levels that can be sustained even at current demands, much less future ones. At least one quarter of important commercial fish stocks are overharvested (high certainty). Humans increased the capture of marine fish up until the 1980s by harvesting an ever-growing fraction of the available resource. Marine fish landings are now declining as a result of the overexploitation of this resource. Inland water fisheries, which are particularly important in providing high-quality diets for poor people, have also declined due to habitat modification, overfishing, and water withdrawals." (Millennium Ecosystem Assessment, 2005. *Ecosystems and Human Well-being: Synthesis*. Island Press, Washington, DC).

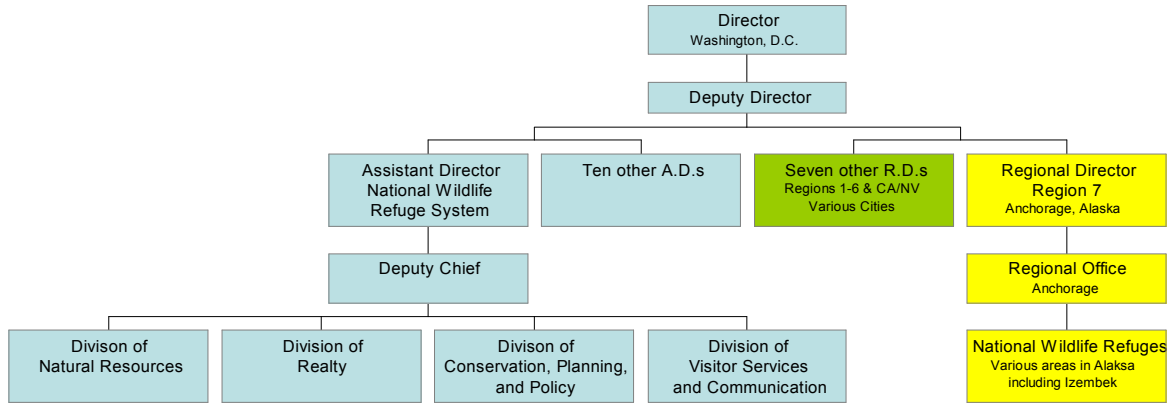
Source:

The Ramsar Convention on Wetlands. "The Conservation and Sustainable Use of Fish Resources." The Ramsar Convention on Wetlands. 6 July 2005. 4 Dec. 2006. <[http://www.ramsar.org/cop9/cop9\\_dr04\\_e.htm](http://www.ramsar.org/cop9/cop9_dr04_e.htm)>.

**Appendix II.** USFWS organizational chart, Salary Tables, and general job descriptions.

**USFS Organizational Structure**

United States Fish and Wildlife Service



*Note:* National organizational structure of the Fish and Wildlife Service. Blue boxes indicate that the positions and divisions are located in Washington, D.C., the green box indicates that the offices are located in various regions throughout the U.S., and yellow boxes indicate that the positions and offices are located in Alaska.

**US General pay scale<sup>19</sup>**

Incorporating the 2.10% General Schedule Increase  
Effective January 2006  
Annual Rates by Grade and Step

Grade	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7	Step 8	Step 9	Step 10	WGA
1	16,352	16,898	17,442	17,983	18,527	18,847	19,383	19,925	19,947	20,450	varies
2	18,385	18,822	19,431	19,947	20,169	20,762	21,355	21,948	22,541	23,124	varies
3	20,060	20,729	21,398	22,067	22,736	23,405	24,074	24,743	25,412	26,081	669
4	22,519	23,270	24,021	24,772	25,523	26,274	27,025	27,776	28,527	29,278	751
5	25,295	26,135	26,975	27,815	28,655	29,495	30,335	31,175	32,015	32,855	840
6	28,085	29,021	29,957	30,893	31,829	32,765	33,701	34,637	35,573	36,509	936
7	31,209	32,249	33,289	34,329	35,369	36,409	37,449	38,489	39,529	40,569	1040
8	34,563	35,715	36,867	38,019	39,171	40,323	41,475	42,627	43,779	44,931	1152
9	38,175	39,448	40,721	41,994	43,267	44,540	45,813	47,086	48,359	49,632	1273
10	42,040	43,441	44,842	46,243	47,644	49,045	50,446	51,847	53,248	54,649	1401
11	46,189	47,729	49,269	50,809	52,349	53,889	55,429	56,969	58,509	60,049	1540
12	55,360	57,205	59,050	60,895	62,740	64,585	66,430	68,275	70,120	71,965	1845
13	65,832	68,026	70,220	72,414	74,608	76,802	78,996	81,190	83,384	85,578	2194
14	77,793	80,386	82,979	85,572	88,165	90,758	93,351	95,944	98,537	101,130	2593
15	91,507	94,557	97,607	100,657	103,707	106,757	109,807	112,857	115,907	118,957	3050

WGA = Within Grade Amounts

**Description of U.S. Fish and Wildlife Service Employees (from the USFWS website)<sup>19</sup>**

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*Refuge Managers.* As stewards of our National Wildlife Refuge System, Refuge Managers are experts in wildlife and habitat protection and restoration. They use the best science and technology to monitor and care for wildlife, use a range of land management techniques to ensure suitable habitat, and provide opportunities for wildlife-dependent recreation for refuge visitors. They work with their neighbors, community organizations, and other partners to represent the interests of wildlife in land-use planning and development.

*Wildlife Biologists.* Wildlife Biologists carry out a wide variety of duties associated with conserving fish and wildlife species, including population surveys, habitat restoration, reintroduction of endangered species, and evaluation of the impacts of Federal projects. A few specific examples of the work they do is to monitor the status and trends of waterfowl migrating across North America, reconstruct wildlife habitats such as wetlands and tallgrass prairie lands, use aerial and ground surveys to examine animal populations, and work with conservation officials in the states and around the world to track animals of mutual management concern, including polar bears, walrus, and seals.

*Fishery Biologists.* Like Wildlife Biologists, Fishery Biologists are also involved in a full range of conservation activities. For example, they restore imperiled aquatic species, remove barriers to fish passage, prevent and control aquatic nuisance species, monitor fish populations and health, develop fishery management plans, raise fish through captive propagation, and other activities in support of a wide variety of fish and other aquatic resources.

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### Appendix III. Line-Item Budget

#### Eelgrass Monitoring

##### Personnel Services

Salaries	\$11,057.90
Fringe Benefits	\$2,764.48

**Total Personnel Services  
Cost** **\$13,822.38**

##### Other Than Personnel Services

Contracts	\$1,500.00
Training	\$100.00
Supplies	\$28,000.00
Travel	\$1,936.00
Office Expenses	\$330.34

**Total OTPS Cost** **\$31,866.34**

**Total Operation Cost** **\$45,688.71**

#### Line-Item Budget

#### Salinity Testing

##### Personnel Services

Salaries	\$10,673.01
Fringe Benefits	\$2,668.25

**Total Personnel Services  
Cost** **\$13,341.26**

##### Other Than Personnel Services

Training	\$100.00
Supplies	\$2,100.00
Travel	\$450.00
Office Expenses	\$330.34

**Total OTPS Cost** **\$2,980.34**

**Total Operation Cost** **\$16,321.60**

#### Line-Item Budget

#### Weir Monitoring

##### Personnel Services

Salaries	\$27,121.00
Fringe Benefits	\$6,780.25

**Total Personnel Services  
Cost** **\$33,901.25**

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<b>Other Than Personnel Services</b>	
Training	\$400.00
Supplies	\$4,001.00
Travel	\$2,573.70
Office Expenses	\$330.34
<b>Total OTPS Cost</b>	<b>\$7,305.04</b>
<b>Total Operation Cost</b>	<b>\$41,206.29</b>

*Line-Item Budget*

**Create Database**

<b>Personnel Services</b>	
Salaries	\$19,086.72
Fringe Benefits	\$4,771.68
<b>Total Personnel Services Cost</b>	<b>\$23,858.40</b>
<b>Other Than Personnel Services</b>	
Supplies	\$1,729.00
Travel	\$818.00
Office Expenses	\$1,651.68
<b>Total OTPS Cost</b>	<b>\$4,198.68</b>

*Line-Item Budget*

**Increase Signage**

<b>Personnel Services</b>	
Salaries	\$2,428.78
Fringe Benefits	\$607.20
<b>Total Personnel Services Cost</b>	<b>\$3,035.98</b>
<b>Other Than Personnel Services</b>	
Contracts	\$1,540.00
Travel	\$75.00
Office Expenses	\$330.34
<b>Total OTPS Cost</b>	<b>\$1,945.34</b>
<b>Total Operation Cost</b>	<b>\$4,981.31</b>

*Line-Item Budget*

**Update Website**

<b>Personnel Services</b>	
Salaries	\$4,681.35
Fringe Benefits	\$1,170.34

	<b>Total Personnel Services Cost</b>	<b>\$5,851.69</b>
<b>Other Than Personnel Services</b>		
Supplies		\$999.00
Office Expenses		\$1,651.68
	<b>Total OTPS Cost</b>	<b>\$2,650.68</b>
	<b>Total Operation Cost</b>	<b>\$8,502.37</b>

*Line-Item Budget*

**Line- item Budget**

**Personnel Services**

Salaries		\$84,783.97
Fringe Benefits		\$21,195.99

**Total Personnel Services Cost \$105,979.96**

**Other Than Personnel Services**

Contracts		\$3,040.00
Training		\$600.00
Supplies		\$36,829.00
Travel		\$6,152.70
Office Expenses		\$8,258.40

**Total OTPS Cost \$54,880.10**

**Total Operation Cost \$160,860.06**

**Grants**

Fisheries Resource Monitoring		\$35,000.00
Parteners for Fisheries Monitoring		\$11,000.00
North American Wetlands Conservation		\$80,000.00
Coastal Conservation		\$35,000.00

**Total Grants \$161,000.00**

**Total Program Budget \$160,860.06**