PIPING PLOVER (*Charadrius melodus*)

SPOTLIGHT SPECIES ACTION PLAN
for the threatened Atlantic Coast and Northern Great Plains populations

Prepared and assembled by:

Endangered Species Program
Northeast Region

Other Contributors:

Corpus Christi, Texas Field Office
Southwest Region

Panama City, Florida Field Office
Charleston, South Carolina Field Office
Southeast Region

North Dakota Field Office
Mountain-Prairie Region

Approved:

Acting Regional Director, Northeast Region

12/4/09
Date

U.S. FISH AND WILDLIFE SERVICE - SPOTLIGHT SPECIES ACTION PLAN

Common Name: Piping Plover

Scientific Name: *Charadrius melodus*

Lead Region: Region 5 (Northeast Region)

Lead Field Office: Not applicable

Species Information:

Status: Threatened (except in the watershed of the Great Lakes, where endangered and addressed in a separate spotlight species action plan)

Recovery Priority Number: 2C

Recovery Plans: Piping Plover (*Charadrius melodus*) Atlantic Coast Population, Revised Recovery Plan, May 1996

Great Lakes and Northern Great Plains Piping Plover Recovery Plan, May 1988

Most Recent 5-year Review: September 2009

Threats: In the Atlantic Coast breeding range, primary threats include loss and degradation of habitat due to development and artificial beach stabilization, disturbance by humans and pets, and predation. Major threats in the Northern Great Plains breeding range include predation and loss and degradation of habitat due to impoundments, river channelization, and manipulation of water flows, sand and gravel mining, oil and gas development, and invasive species. All piping plover populations, including the endangered population breeding in the watershed of the Great Lakes, face continuing habitat degradation and increasing human disturbance during the two-thirds of the annual cycle spent in their coastal migration and wintering range. Wind turbine generators and climate change are emerging rangewide threats.

Accelerating sea-level rise is a widely-accepted climate-change-induced threat affecting the Atlantic Coast breeding population throughout its annual cycle and both inland breeding populations during more than two-thirds of their life cycle spent in their coastal migration and wintering range. Near-term decisions regarding coastal management will be key influences determining whether and where coastal piping plover habitat will be maintained in the face of accelerating sea-level rise.

Following are 5-year goals, measures, and actions for the Atlantic Coast and Northern Great Plains breeding populations, and the coastal migration and wintering range, respectively.

ATLANTIC COAST BREEDING RANGE (provided by the Northeast Region)

Goal: The 5-year goal is to maintain or improve the status of the Atlantic Coast population in its breeding range.

Measures:

1. Reduced or stabilized threat from effects of accelerating sea-level rise in the Atlantic Coast breeding range.

2. Increased abundance of the Atlantic Coast breeding population. Specifically, we will recoup and maintain the New York-New Jersey recovery unit target (≥575 pairs, reached in 2007 but not maintained in 2008) and attain ≥365 pairs in the Southern recovery unit, while maintaining the target (≥625 pairs) for the New England recovery unit. See the discussion below regarding increased cooperation with partners in Canada to foster population growth in the Atlantic (Eastern) Canada recovery unit.

3. Demonstrated progress towards meeting Atlantic Coast recovery criterion 4, i.e., long-term agreements for protection and management of piping plovers and habitat in their breeding range.

Actions:

For Measure 1, reduced or stable threat from effects of sea-level rise:

The piping plover's coastal breeding habitats (barrier beaches) are dynamic systems, innately adapted to respond to fluctuations in sea level (and thereby providing protection to landward areas), but acceleration of sea-level rise poses risk of overwhelming natural response mechanisms. High quality piping plover habitats, including wash-over fans, naturally-functioning inlets, and bayside flats, are indicators of healthy barrier beaches that can also maximize long-term protection of mainland developments from coastal storms and flooding. Although the piping plover recovery program has little or no potential to directly influence the rate of sea-level rise, assiduous conservation of natural habitat formation processes via near-term coastal management decisions offers considerable hope for this species to withstand threats from sea-level rise. This measure responds to recommendation 4 for the Atlantic Coast breeding range in the 5-Year Review.

Actions:

A. Develop a specific strategy synthesizing information about effects of sea-level rise (listing factor E, identified in the 2009 status review) on piping plover breeding habitat, articulating sea-level-rise-related habitat conservation recommendations, and providing outreach materials.

B. Work with land managers to incorporate explicit measures to preserve resilience of piping plover habitat to sea level rise into at least one pilot management plan for an

important breeding site. Summarize this plan and its relevance to piping plover conservation in a written case study to demonstrate an approach to proactive planning for sea-level rise to managers of other sites in the piping plover's Atlantic Coast breeding range.

Roles and responsible parties: The Northeast Regional Office Endangered Species Program will lead development of a strategy addressing sea-level rise threats and the demonstration management plan. Opportunities for partnership with the Region 5 Coastal Program have already been broached and will be pursued. Expertise of External Affairs will be sought during development of outreach materials. Participation from at least one Region 5 field office will be required to accomplish management planning for the breeding site.

Discussions are underway to foster a critical partnership relative to this threat with experts at the U.S. Geological Survey (USGS) Coastal and Marine Geology Program. Interest has also been expressed by a number of State wildlife agencies and other important cooperating agencies and organizations. Managers of potential sites for management planning include (but are not limited to) National Park Service, State parks agencies, municipal or county beach agencies, and nongovernmental organizations.

Estimated costs and additional funding analysis: Primary U.S. Fish and Wildlife Service (USFWS) costs will be salaries and travel, estimated at $40,000 ($8,000 per year) over the life of this plan. If no additional funding is made available, this can be accomplished using existing staff, but will detract from other duties and projects. The USGS has committed substantial funds to improve decision support capabilities related to sea-level rise for other Department of Interior agencies over a concurrent 5-year period, so a USFWS commitment to this action positions the piping plover recovery program to fully participate in inter-agency efforts. However, $30,000 additional funding would allow for development of two additional site-specific plans, providing a more diverse set of case studies and thereby encouraging wider application by other land managers throughout the range.

For Measure 2, increased abundance of Atlantic Coast breeding population:

Actions:

Productivity needed to increase abundance of breeding Atlantic Coast piping plovers requires continuing implementation of intensive annual management activities to reduce human disturbance, predation, and habitat degradation (listing factors A, C, D, and E). The USFWS will work with its many Federal and non-Federal partners to continue vigorous implementation of Atlantic Coast recovery plan tasks 1.1 through 1.5. In addition, contracts with U.S. Department of Agriculture (USDA) Wildlife Services will be used to accomplish targeted predator management at strategic sites where predation has been identified as a major factor limiting productivity. Collaborative efforts (especially information exchange) with partners in eastern Canada will also be increased to encourage management efforts and foster population growth in the Atlantic (Eastern) Canada recovery unit.

Roles and responsibilities: The USFWS Northeast Regional Endangered Species staff and Ecological Services Field Offices in Maine, New England, New York, New Jersey, Chesapeake Bay, Virginia, and North Carolina (Southeast Region) have lead responsibility for working with our many piping plover conservation partners to attain this measure by continuing annual protection of breeding Atlantic Coast piping plovers in the U.S. portion of their range. As in the past, recovery efforts for breeding Atlantic Coast piping plovers will make full use of authorities under the Endangered Species Act, (ESA) sections 7 and 9. The National Wildlife Refuge System, the Office of Law Enforcement, and External Affairs will continue to play very important roles in this action.

Increasing abundance of Atlantic Coast piping plovers is fundamentally dependent on continued efforts by a broad network of dedicated cooperators. In 2002, for example, 73 Federal, State, and local governmental agencies and private organizations played key roles in conservation efforts at 281 U.S. Atlantic Coast piping plover breeding sites. It is anticipated that USDA Wildlife Services will be an especially important partner in predator management activities to boost piping productivity at critical sites.

Estimated costs and additional funding analysis: Conservation of breeding Atlantic Coast piping plovers entails expensive, labor-intensive monitoring, fencing, signing, wardening, predator management, and other activities that require continued implementation to counter threats that are present every year. In 2002, U.S. Atlantic Coast piping plover cooperators expended 95 hours/pair of paid staff time and >$3.4 million total on conservation activities for breeding piping plovers. Only a small portion of recent expenditures derives from endangered species recovery funds (however, national wildlife refuges are major participants). Merely maintaining current piping plover abundance will necessitate similar effort and expenditures during the next 5 years. However, attainment of population growth targets described above will necessitate additional USFWS commitment of $200,000 per year to support intensive efforts at selected sites that include predator management, public use management, outreach, and law enforcement. Collaborative efforts by Rachel Carson National Wildlife Refuge, Maine Audubon Society, Maine Department of Inland Fisheries and Wildlife, USFWS Office of Law Enforcement, USDA Wildlife Services, and the Maine Warden Service in 2009 provide a model for this approach.

For Measure 3, progress towards long-term agreements for protection and management of breeding Atlantic Coast piping plovers and habitat:

Actions:

Complete at least one proto-type agreement to assure long-term protection of Atlantic Coast piping plovers and their habitat at an important site(s) in New England (responds to listing factors A, C, D, and E; recovery task 1.62; and recommendation 3 for the Atlantic Coast breeding range in the 5-Year Review). Alternatively, a General Conservation Plan (per Director's memorandum, dated 5 October 2007) may be developed.

Roles and responsibilities: The New England Field Office and the Northeast Regional Office will lead efforts to complete this action, which may involve use of conservation planning and permits under the ESA, section 10(a)(1)(B) or a section 7 consultation with a Federal land management agency. Advice will be sought from the relevant State wildlife agency(ies).

Estimated costs and additional funding analysis: Primary USFWS costs will be salaries and travel by existing staff, estimated at $40,000 over the life of this plan. With additional funding ($50,000), up to two more agreements could be completed.

NORTHERN GREAT PLAINS BREEDING POPULATION (provided by the Mountain-Prairie Region)

Goal: The 5-year goal for the Northern Great Plains piping plover population is to minimize population fluctuations during wet periods and maintain progress toward breeding pair abundance targets set in the 1988 Northern Great Plains Recovery Plan. The Northern Great Plains piping plover population and reproductive success fluctuates in conjunction with region-wide wet/dry cycles. After a multi-year drought (extending from 2001-2008), the region appears to be entering a wet cycle. During such wet cycles, there is a decrease in available habitat as water levels rise on rivers, reservoirs and alkali lakes and habitat is submerged. In order achieve our goal during this wet period, we plan to work with our partners to intensively manage to provide quality breeding habitat even during wet years. Furthermore, recovery efforts must maintain fledge ratios (the number of chicks fledged per adult pair) high enough to minimize population fluctuations. The most recent published study found a fledge ratio of 1.24 throughout the Northern Great Plains is necessary to maintain a stable population.

Measures:

1. Maintenance of the U.S. Northern Great Plains piping plover population at or above 2,250 individuals over the next 5 years.

2. Continued exchange of information with Canadian biologists to assess trends across the entire Northern Great Plains population.

Actions:

A. Continue monitoring and management work on the U.S. alkali lakes, the Missouri River, and other rivers and sandpits in Nebraska and elsewhere to provide habitat and improve productivity. Federal, State, and non-profit agencies are currently deeply involved in actions designed to provide habitat to plovers and improve nesting and fledging success. These activities require significant inputs of time and funds, with benefits evident in improved reproductive success and increasing population numbers. State wildlife and water management agencies in Montana, North Dakota, South Dakota, and Nebraska are engaged with the U.S. Army Corps of Engineers (Corps) in identifying and planning habitat creation and monitoring projects. State employees from Montana, North Dakota, South Dakota, Nebraska, Colorado, Kansas, Minnesota, and Iowa assist with piping plover surveys, especially during the International Piping Plover Census, conducted every 5 years. In Nebraska, the State has taken an especially active role, engaging in habitat rehabilitation, research and annual monitoring. While we are concerned about range constriction and consider all recovery efforts important, the vast majority of U.S. Northern Great Plains piping plovers currently breed in Montana, North Dakota, South Dakota, and Nebraska. Thus, we will focus this plan on continuing management in those states. Ongoing activities must continue or expand to achieve the population abundance goal.

A.1. Alkali lakes (Montana and North Dakota): Continue and expand ongoing monitoring and management activities such as working with landowners, placing predation exclusion cages on nests, predation control, and habitat manipulation.

Roles and responsibilities: This work is primarily done by refuges and The Nature Conservancy which monitor nests annually and place predator-exclusion cages on nests. In addition, the USFWS Partners program has collaborated with refuges, The Nature Conservancy, and other landowners to perform management activities to improve productivity on the alkali lakes. These activities include: burying rock piles, removing old buildings and trees to reduce predation pressure; burning and herbicide application to improve plover habitat; fencing to exclude cattle and predators; and providing alternate water points for cattle so that they can be kept off of plover beaches. The North Dakota Ecological Services office works closely with these entities to coordinate these projects.

Estimated costs and additional funding analysis: Primary USFWS costs to cover this work at the existing level will be salaries, estimated at $177,200 per year. However, without a stable source of funding, it is uncertain whether this work can be maintained at the existing level. Currently, several personnel (especially refuge personnel) are working extensively on plovers to the detriment of other duties and projects. Additional annual funding of $166,200 for 10 technicians would ensure that the plover work could continue on the alkali lakes without detracting from other duties. This program is currently coordinated by a six-month permanent position. Funding this position full-time ($40,000 for an additional six months per year) would enhance public outreach opportunities (especially landowner contacts), data management to analyze the effects of management activities more closely and implement alterations as needed, as well as more on-the-ground activities to improve habitat and reduce predation pressure.

A.2. Missouri River (Montana, North Dakota, South Dakota, Nebraska): Continue to cage nests and monitor reproductive success. The Corps has been monitoring bird success on the entire Missouri River system since 1994. While their monitoring methods may change somewhat based on results of a recently completed study, extensive annual monitoring in some form will continue.

Roles and responsibilities: The Corps, through a 2003 Biological Opinion, has primary responsibility to performing monitoring and management work on the Missouri River. The USFWS Ecological Service offices in Montana, North Dakota, South Dakota, and Nebraska, as well as the National Park Service, coordinate with the Corps. South Dakota Game, Fish and Parks funds three seasonal employees to assist with monitoring work.

Estimated costs: Primary USFWS costs to cover this work at the existing level are salaries for Region 3 and Region 6 biologists to consult with the Corps. The Corps budget for monitoring is approximately $1 million annually.

A.3. Nebraska (Platte, Elkhorn, Loup, Niobrara Rivers, sandpits, and lakeshore housing developments): Continue to monitor nesting and brood-rearing success. The Nebraska Tern and Plover Conservation Partnership, the Central Nebraska and Irrigation District, the National Park Service, and the USFWS participate in annual monitoring of nesting birds in Nebraska. Cages are deployed in most locations, and nesting areas are posted and signed as needed. The Nebraska Tern and Plover Conservation Partnership and the Central Nebraska and Irrigation District are very actively manipulating habitat and performing extensive public outreach to improve plover reproduction.

Roles and responsibilities: This work is done in coordination with a number of partners, including Nebraska Tern and Plover Conservation Partnership, the Central Nebraska and Irrigation District, the National Park Service, and the USFWS Ecological Services field office and Partner's Program.

Estimated costs: Primary USFWS costs for this work are salaries and airboat use for biologists assisting with surveys and coordinating with partners. The Nebraska Tern and Plover Conservation Partnership has an annual budget of approximately $94,500 for monitoring and coordination work on part of the Platte River, sandpits, and housing developments around sandpits. The Central Nebraska and Irrigation District spends approximately $48,000 annually for monitoring, public outreach, and habitat improvement projects on Lake McConaughy.

B. Continue and expand sandbar creation and rehabilitation projects. Because of river alterations (dams, channelization, water extraction, bank reinforcement, hydropeaking, etc.) throughout the Northern Great Plains breeding range, the ephemeral unvegetated sandbars that plovers nest on are rarely created or maintained through contemporary flows. Without ecosystem improvements so that the river systems can naturally create sandbars or scour them of vegetation, ongoing management is needed to provide sufficient breeding habitat throughout a large part of the species' U.S. Northern Great Plains breeding range.

B.1. Missouri River (Montana, North Dakota, South Dakota, Nebraska): Through the 2003 Amendment to a 2000 Biological Opinion, the Corps has committed to ensuring that approximately 11,886 acres of plover nesting and brood-rearing habitat are available on the Missouri River starting in 2011, with an interim goal of 5,502 acres available in 2005. The Corps started constructed sandbar habitat in 2004. They are experimenting with methods to remove vegetation from existing sandbars to make them suitable for nesting again. However, the acres available for plover use thus far have fallen far short. Only an estimated 2,013

acres were available in 2005, and a 2009 Corps analysis suggests that more habitat is being lost annually than is being created.

Roles and responsibilities: The Corps has primary responsibility for implementing the Biological Opinion by implementing the Reasonable and Prudent Alternatives for plovers. This work is being done in coordination with a number of partners, including State agencies in North Dakota, South Dakota, and Nebraska, the National Park Service, USDA, and more recently, the Missouri River Recovery Implementation Committee (a group of stakeholders involved in Missouri River management). Various USFWS Ecological Service offices work closely with the Corps during planning and implementation of these projects and other provisions of the Biological Opinion.

Estimated costs: The Corps funds all of the ongoing work on the Missouri River, as well as some USFWS salaries and all travel costs associated with Missouri River work. In addition to personnel time, the Corps spends approximately $3 to 5 million dollars annually on habitat creation and improvement projects that benefit plovers on the Missouri River. As current management is resulting in the loss of more habitat annually than is created on the system, additional funding or altered management is necessary to meet the habitat goals for the system. Primary cost to the USFWS is personnel time.

B.2. Nebraska (Platte, Elkhorn, Loup, Niobrara Rivers, sandpits, and lake-side housing developments): On the lower Platte River in 2009, a program was initiated to spray herbicide and remove vegetation from islands that were created in an unusual 2008 high-water event. The islands created in this event supported 47 plover nests as well as 264 endangered least tern nests in 2009. This was the first successful nesting in this part of the river in a number of years. Although plovers nest on the rivers, sandpits, and lakeshore housing developments in Nebraska, the birds that nest on the river are more successful than those nesting on sandpits. Efforts are continuing to reduce adverse to breeding piping plovers by sandpit operators, housing developers, and builders.

Roles and responsibilities: On the Platte River, the Nebraska Tern and Plover Conservation Partnership is working with the USFWS Partners Program, the Nebraska Game and Parks Department, and the Girl Scouts to experimentally clear a sandbar to make it suitable for plover and least tern nesting.

Estimated costs: Primary USFWS costs are salaries and travel for Ecological Services biologists to work with the Nebraska Tern and Plover Conservation Partnership. The cost of this work is estimated to be $300/acre. The Nebraska Tern and Plover Conservation Partnership is scheduled to clear 50 acres in 2010 for a total cost of $15,000. The Partnership hopes to continue to do at least this much annually.

C. Continue information exchange with piping plover biologists in Prairie Canada: Northern Great Plains plover management and recovery efforts face many of the same issues both in Canada and the United States. Biologists currently discuss (via periodic conference calls and email exchanges) population numbers and trends, as well as management challenges and solutions. Since U.S. and Canadian populations are linked, both by some exchange of birds on the breeding grounds and by shared wintering areas, recovering the metapopulation will require management on both sides of the border.

Roles and responsibilities: USFWS biologists from Ecological Services and Refuges regularly exchange information with Canadian biologists.

Estimated costs: Primary USFWS costs are salaries and occasional travel for Ecological Services biologists to work with their Canadian counterparts.

D. Revise the Northern Great Plains Recovery Plan. The Northern Great Plains recovery plan is over 20 years old, does not discuss several threat factors, and includes numeric recovery goals that may not provide for the population's long-term conservation. Substantial new information has become available to inform recovery needs. An updated recovery plan would allow managers to re-examine the population's conservation needs in light of this new information. In light of the amount of scientific research conducted since the original recovery plan was drafted, the USFWS would like to initiate this effort with a conference to discuss plover biology, successful conservation actions, and recovery needs.

Roles and responsibilities: The North Dakota Ecological Services Field Office would likely lead the effort to rewrite the recovery plan, with a team drawn from experts from many of the organizations discussed above, in addition to the academic community.

Estimated costs and additional funding analysis: Primary USFWS costs would be salaries and travel for Ecological Services biologists to organize the team, meet with experts, and write the plan. Cost of completing the plan is estimated at approximately $250,000.

Roles of other agencies: As discussed above, a number of State and Federal agencies and non-profit organizations work on projects to benefit piping plovers. Piping plover recovery is highly dependant on these partnerships.

Roles of other FWS programs:

Refuges Division: The refuges in North Dakota and Montana play key roles in piping plover recovery. The refuges provide staff (often out of their station funds) to work with landowners, perform plover habitat enhancement projects, cage nests to exclude

predators, and monitor reproductive success. Approximately half of the U.S. Northern Great Plains population nests on the alkali lakes, so the refuges' work is critical to the population's survival and recovery. Refuges in South Dakota help to survey for plovers during the International Piping Plover Census, conducted every 5 years.

Law Enforcement Division: On the breeding grounds, law enforcement patrols popular river and lake areas on busy summer weekends to reduce the impacts of recreation on piping plover productivity. Because of the large geographic area and the small law enforcement staff, many plover areas are still impacted by human disturbance. A greater law enforcement presence on the rivers would likely improve reproductive success by ensuring that the public respects closures posted for plover nesting.

Partners Program: In Nebraska, the Partners Program is working with the Nebraska Tern and Plover Conservation Partnership to devegetate sandbars for nesting and brood-rearing habitat. In North Dakota, the Partners Program has worked with refuges and The Nature Conservancy on projects to reduce predation pressure and keep cattle off of plover nesting beaches. With additional funds, more projects could be completed.

Realty: In North Dakota, the Realty Division has worked with Ecological Services and the Refuges to target landowners with plover alkali lakes for inclusion into the easement program.

Additional funding analysis:

Several of the actions listed above describe potential benefits from funding above that provided by existing budgets. Additional funding also could be directed towards habitat improvement, outreach, law enforcement, predation control research and meta-population movement research.

Habitat enhancement

Nebraska: With additional USFWS funding, additional acres of sandbar on the lower Platte River could be cleared annually to provide riverine nesting habitat. Because of altered river dynamics, these islands are unlikely to be naturally scoured of vegetation or reshaped by river action regularly enough to provide consistent habitat for plover nesting. Therefore, annual work is necessary to keep these areas available for nesting. While one year of funding would not provide a permanent solution, it would provide more habitat in the short term. This project could be funded at a lower level, with the acreage cleared varying depending on the funding provided.

Estimated Cost: $30,000 annually ($300/acre for 100 acres)

Alkali Lakes: Projects on private lands to improve plover productivity. Perform activities near plover breeding areas to keep predators and cattle off of plover habitat. This could be done by seasonal refuge staff. The USFWS Partners program may also assist with this work. This work could be funded at almost any level, with the amount of

work done varying with the funding level. While some ongoing maintenance is required for some of these projects (e.g. fences need maintenance over time), these projects should have long-term benefits for the species.

Estimated Cost: 12 miles of fencing at $4,500/mile = $54,000; six junk piles at $1,000/pile = $6,000; burying six rock piles at $500/pile = $3000, six wells at $15,000/well = $90,000, Total = $153,000. Refuge staff time to perform this work (could be the same seasonals described in Measure 1 above): 6 months total time annually = $16,620/year

Non-natural island removal on the alkali lakes

On both the alkali lakes and river systems, plovers nest successfully on bare islands. However, as the islands age, they become vegetated and support populations of a variety of plover predators. On the alkali lakes, a number of islands built originally for duck nesting have been taken over by gull colonies. The gulls have been observed eating plover chicks, and it is thought that their presence severely depresses plover productivity in the surrounding area, up to several miles away. Refuge staff have begun to do predation control on the gulls nesting near plover beaches, but removing some gull habitat may be a more efficient method to help reduce predation pressure on plovers. This work would need to be coordinated with Ducks Unlimited, which originally built the islands.

The work would be coordinated with USFWS refuge staff, the Ecological Services office, as well as Ducks Unlimited. This project could be funded at a lower level, with the number of islands removed dependant on the amount of funding provided.

Estimated Cost: $50,000 (10 islands at $5,000 each).

Outreach

Fund two outreach positions, one in the northern region to work on alkali lakes landowner outreach and along the Missouri River system in North Dakota and Montana, the other to focus on birds in Nebraska and South Dakota. The alkali lakes work would be modeled after the successful Canadian program "Plovers On Shore," which recognizes the importance of private landowners to plover recovery and works with them so that plover beaches and the surrounding prairie remain undisturbed. This may involve projects such as fencing to keep cattle off beaches seasonally. The current alkali lakes coordinator position (described under Action A.1) conducts some landowner outreach, primarily to obtain permission for work on private lands. However, most of the coordinator's time is spent on organizing and running field season logistics, followed by data analysis. A separate position focused primarily on public outreach on both alkali lakes and the Missouri River would provide sufficient time to instigate and implement a number of outreach programs.

The second position would focus on birds in Nebraska and South Dakota, particularly Lake McConaughy in Nebraska, where human recreation on limited available habitat can conflict with plover nesting. This position could also work with the Platte River Recovery Implementation Program in the central Platte, the National Park Service's National Scenic River-Niobrara River program, the Federal Energy Regulatory Commission, lakeshore housing developments, power plants, the aggregate mining industry, power generating companies, irrigators, natural resources districts in Nebraska, and agriculture organizations (e.g., county weed boards).

Both outreach positions would work with the public to engender a better understanding and appreciation for piping plover needs on the Missouri River system and the U.S. Northern Great Plains. Because of threats (factor A, identified in the 2009 status review), it is important that the habitat that is available remains free from human activity so that plovers can successfully nest and raise young.

The northern position could be located at a refuge in North Dakota. The southern position could be located with the non-profit Tern and Plover Conservation Partnership in Nebraska. The Corps may assist with part of the salaries for Missouri River work. Work to improve plover productivity on private lands would be coordinated through the USFWS Partners program and/or The Nature Conservancy.

Estimated Cost: Two permanent positions at a 9-11 grade level, $130,550 to 157,952 annually ($65,275 to $78,976/position).

Law Enforcement

Because there are so few sandbar islands remaining on the Missouri River, recreators often use the islands that the plovers are nesting on, even if the nesting areas are delineated with "No Trespassing" signs. With limited law enforcement staff, the river is very lightly patrolled, often only on 2 or 3 weekends per year. A law enforcement agent focusing on the river during the summer would reduce the impact that recreators have on breeding plovers. The loss of productivity due to human disturbance is difficult to assess, because the impacts may not be obvious (e.g. a nest may fail if a bird is kept off of the nest for too long), and are likely much larger than the documented losses due to direct mortality (e.g., crushing).

Estimated Cost: $150,000. Part of the cost may be paid by the Corps. The USFWS is currently in discussions with the Corps regarding this work.

Research

Predation Control Research: Some of the refuges in North Dakota and Montana began to perform predation control (primarily gull control) in 2008. The refuges are evaluating their data to assess whether this project improved plover productivity, however they have not performed this review in a rigorous scientific manner. A well designed landscape level research project, including controls and experimental treatments is critical to

determine conclusively the effect that these actions are having on the piping plover population.

Estimated cost: $250,000 for a 4-year research project.

Metapopulation movement within the Northern Great Plains: It has been postulated that if there is not much habitat on the Missouri River system, birds will nest on the alkali lakes and vice versa. Sightings of banded birds have established that birds do move between the Missouri River, Nebraska, and the alkali lakes. There have been some sightings of birds hatched in Saskatchewan apparently breeding on the alkali lakes in Montana. However, it is not known if there are large-scale movements of piping plovers from one habitat type to another, in particular between the alkali lakes in the U.S. and Canada and the Missouri River system. A study of large-scale piping plover movements over time would help to identify where to focus management actions to ensure that there is habitat available in areas where birds may go if habitat in one area is not suitable in a given year.

Estimated cost: $419,428 for a 4-year research project.

COASTAL MIGRATION AND WINTERING RANGE (provided by the Southeast and Southwest Regions)

Goal: The 5-year goal is stable or declining threats in the coastal migration and wintering range of all three breeding populations.

Measures:

1. Increased effectiveness and consistency of recommendations pertaining to reduction of threats (including threats from accelerating sea level rise) from proposed coastal development and shoreline stabilization projects on the quality and quantity piping plover's coastal migration and wintering habitat.
2. Decreased disturbance to piping plovers in their coastal migration and wintering range.

Actions:

For Measure 1, improved recommendations to reduce threats from proposed coastal development and shoreline stabilization projects on the piping plover's coastal migration and wintering habitat:

Review of threats to piping plovers and their habitat in their migration and wintering range indicates a continuing loss and degradation of habitat due to sand placement projects, inlet stabilization, sand mining, groins, seawalls and revetments, exotic and invasive vegetation, and wrack removal. This cumulative habitat loss is, by itself, of grave concern for piping plovers, as well as the many other shorebird species competing with them for foraging resources and roosting habitats in their nonbreeding range. However, artificial shoreline stabilization also impedes the processes by which coastal habitats adapt to accelerating sea-level rise, thus setting the stage for compounding future losses[1].

Actions:

A. Initiate pilot projects in Texas (fiscal year 2010-11) and NW Florida (fiscal year 2011-12) by creating maps for each bay system to show the current location and quantify the areal extent of current piping plover habitat. Data showing known plover use will be overlaid on these maps. Important use areas and sites that continue to support natural coast formation processes will be highlighted as areas needing special protection and incorporated into sea level rise predictive models (see Action B, below). Responds to recommendations 1.b.i and iii for the wintering and migration range in the 5-Year Review.

   Roles and responsibilities: USFWS Texas coastal Ecological Services Field Offices in Corpus Christi (CCFO), Clear Lake (CLFO),) and Panama City Ecological

[1] See also introduction to sea-level rise threats under measure 1 for the Atlantic Coast breeding range.

Services Field Office (PCFO) in Florida will supervise and assist in map-making and provide resources needed to accomplish this task. If additional funding is made available in FY 2010, two Student Conservation Association (SCA) interns would be hired to assist with this process over the period from June through August, 2010.

Years: 2010 - 2012

Estimated costs: Fiscal year 2010-11: SCA = $5,000 per intern x 2 = $10,000 FO staff salary = 15 percent of a FTE (total salaried biologist time, split between the 2 offices and possibly involving multiple staff in each office) = $15,800. Total estimated cost = $25,800.

Fiscal year 2011-12: FO staff salary or intern assistance [GIS support: $10,000 and 15 percent of FTE: $15,800]. Total estimated cost = $25,800.

Overall total = $51,600. Field Office salaries are anticipated from existing budgets, but SCAs will require additional (new) funding[2].

B. Estimate potential piping plover habitat losses due to rising sea levels at key areas along the Texas coast using SLAMM (Sea Level Affecting Marshes Model) and/or other modeling programs. The modeling and field data collection will generate products useful for assessing of habitat vulnerability and formulating recommendations for protecting (or possibly enhancing) areas. Responds to recommendations 1.b.v and 9.a-b for the wintering and migration range in the 5-Year Review.

Roles and responsibilities: Staff from the CCFO and CLFO will collaborate with USFWS' National Wetlands Inventory (NWI) to develop appropriate sea level rise modeling. The CCFO will assist in this effort by gathering elevation data and water level data from seasonally-emergent seagrass beds, mud flats, and oyster reefs known to be used by plovers in mid-winter. This data collection will augment information currently being produced about sea level rise in the Corpus Christi Bay area through a cooperative effort between the Coastal Bend Bays and Estuaries Program and the Harte Research Institute for the Gulf of Mexico.

Years: Fiscal years 2011-2012

Estimated costs: FO staff salary 5 percent (half CCFO, and half CLFO) of one FTE each year ($5,280) for 5 years = $26,400 total from existing budgets. NWI is already committed to updating the NWI maps for some areas of the Texas coast with their existing funding. The Southwest Region NWI has committed funding via an interagency agreement with USGS' National Wetlands Research Center to update

[2] New funding for SCA and STEP positions, Coastal Workshop, and elevation surveys of seasonally-emergent habitat will be sought from a variety of sources including discretionary 1113 funds, Climate Change funds (if available), section 6 grants, etc. If new sources of funds are not available, the work may still be accomplished, but not within the timeframes indicated and likely not before the end of the 5-year horizon of this Action Plan.

maps of the most southern part of the Texas coast. Additional funds (see footnote 2) needed to collect elevation data for seasonally-emergent habitat in Corpus Christi Bay = $10,000. Total estimated cost = $36,400

C. Ecological Services offices in coastal Texas (CCFO and CLFO); Florida (PCFO), and South Carolina (SCFO) will closely coordinate to develop a consistent approach and recommendations for use in section 7 consultations for projects that could destroy or degrade piping plover habitat, especially projects that would impede the ability of the barrier islands to respond to natural habitat building processes in the context of accelerating sea-level rise. Development of recommendations will be closely coordinated with other Ecological Services field offices along the southeast Atlantic and Gulf coasts. Funding for a half-time STEP position will be needed to help compile conservation measures, reasonable and prudent measures, and terms and conditions from all biological opinions across the non-breeding range of the plover. A workshop will be conducted to assist development of sound recommendations from appropriate Federal and State partners as well as scientific and technical experts. Responds to recommendations 3.a-f for the wintering and migration range in the 5-year Review.

Roles and responsibilities: CCFO, CLFO, PCFO, and SCFO and Coastal Program staff will collaborate in this effort. The Coastal Program will assist with the workshop and coordination with the coastal National Wildlife Refuges, the National Park Service, the Corps, State wildlife and coastal management agencies, and research scientists.

Years: Fiscal years 2010 to 2012.

Estimated costs: Staff costs from existing budgets include CCFO and CLFO – Staff salary = 30 percent of one FTE (20 percent CCFO & 10 percent CLFO) = $32,000; PCFO staff salary and overhead (one FTE, 10 days per year for 2 years) = $8,660; SCFO $3000 per year for 2 years = $6000. Additional funds (see footnote 2) will be required to fund a half-time GS-5 STEP position ($15,000) and the workshop ($10,000). Total estimated cost = $71,660.

D Conduct research to refine understanding of shoreline stabilization project impacts to piping plover habitat quality (e.g., prey resource reduction and recovery rates, roosting habitat availability and proximity to foraging habitat, project-induced recreational disturbance). In the past, USFWS has relied on piping plover presence/absence surveys to detect project impacts on nonbreeding piping plovers. Since piping plovers have high site fidelity that may cause them to remain in degraded habitats, more meaningful approaches are needed to assess impacts to roosting and foraging habitat. Research results will be used to developing a new pre-project survey and habitat evaluation protocol to better predict project impacts on piping plover habitat and facilitate more targeted and consistent recommended measures to minimize adverse effects. Responds to recommendation 8 for the wintering and migration range in the 5-Year Review.

Roles and responsibilities: The SCFO will lead development of field research to determine shoreline stabilization project impacts to piping plover habitat quality including prey resource reduction and recovery rates, roosting habitat availability and proximity to foraging habitat, and facilitation of increased recreational disturbance. Primary partners will include the South Carolina Department of Natural Resources and local universities. This will be directly tied to development of a comprehensive monitoring protocol and habitat management plan template.

Estimated costs: Primary USFWS costs will be salaries and travel by existing staff, estimated at $75,000 ($15,000 per year) over the life of this project, as well as $500,000 ($100,000 per year) in additional funds (see footnote 2) for research data collection, processing, and analysis in order to develop the comprehensive monitoring and protocol management plan.

For Measure 2, decreased disturbance to piping plovers in their coastal migration and wintering range:

Inadequate management of increasing numbers of beach recreationists has been identified as a major threat that reduces the functional suitability of coastal migration and wintering habitat and increases pressure on piping plovers and other shorebirds depending upon a shrinking habitat base. A demonstration project will develop and implement a conservation management plan to decrease disturbance to piping plovers at sites under local government and State control. Responds to recommendation 2 for the wintering and migration range in the 5-Year Review.

Actions:

A. Conduct surveys to gather data needed to compare levels of piping plover use and human disturbance on Mustang Island Gulf beach sites belonging to Nueces County and Texas Parks and Wildlife Department (TPWD). Work with both governing entities to develop and implement conservation management recommendations for each area.

   Roles and responsibilities: CCFO, SCA intern, STEP position, TPWD Park staff, Nueces County Park Staff will work together to identify study sites and develop disturbance minimization recommendations.

   Years: Fiscal years 2010 to 2011.

   Estimated costs: 3 months of SCA intern time = $5,000 and 4 months of half-time STEP position GS 5 = $4,900, both from additional funds (see footnote 2). CCFO staff supervision and participation from existing budgets 7 percent FTE = $7,500. Total estimated cost = $17,400.

B. Monitor effectiveness of implemented actions from Action A (above) and produce annual reports summarizing results and recommendations to improve future

implementation.

Roles and responsibilities: Same as Action A; CCFO STEP position will assume lead for monitoring and report production in collaboration with other partners.

Years: Fiscal years 2011 to 2015.

Estimated costs: Additional funds (see footnote 2) required for 40 percent of a half-time STEP position - $6,000/year x 4 years = $24,000; CCFO staff supervision and participation (from existing budgets), 2 percent FTE/year = $2,000/year x 4 years = $8,000. Total estimated cost = $32,000.

Additional funding analysis:

As specified, timely implementation of every action described above for the nonbreeding range is contingent on at least partial funding beyond existing budgets. Further demonstrated progress towards long-term maintenance of wintering habitat sufficient to support breeding populations (Atlantic Coast recovery plan delisting criterion 5, Great Lakes recovery plan delisting criterion 3, Northern Great Plains recovery plan recovery criterion B) can be attained by:

A. Develop a comprehensive conservation plan for piping plovers in the U.S. portion of their coastal migration and wintering range that summarizes important information about biology, habitat use, and threats and outlines the tasks needed to conserve the species in this portion of its life cycle. This action is best accomplished by a contractor working in close coordination with USFWS field office staff in Regions 2 and 4. Responds to recommendation 1 for the wintering and migration range in the 5-Year Review. *Preliminary cost estimate* - $75,000 for outside contracting, plus $30,000 for USFWS staff coordination in Regions 2 and 4.

B. Conduct a study to refine understanding of factors that determine plover use of wintering habitats with emphasis on understanding effects on piping plover fitness. Responds to recommendations 8, 10, and 11 for the wintering and migration range in the 5-Year Review. *Preliminary cost estimate* - $150,000 per year for 4 years; contract with academic institution, plus $10,000 per year ($40,000 total) for USFWS coordination and oversight.