Part 1: *The Wind Birds*

> *The restlessness of shorebirds, their kinship with the distance and swift seasons, the wistful signal of their voices down the long coastlines of the world make them, for me, the most affecting of wild creatures. I think of them as birds of wind, as "wind birds".*
>
> — Peter Matthiessen, The Wind Birds

Introduction

Shorebirds are indeed among the most remarkable creatures on earth. Each year, most species of shorebirds undertake phenomenal migrations from their wintering grounds as far south as Tierra del Fuego, en route to their breeding grounds as far north as the Arctic Ocean. In the United States, we see many of these birds only twice a year when they mark the seasons for us with their awe-inspiring journeys. Even those species that breed or winter in the U.S. make impressive migratory journeys between their breeding and wintering ranges.

Imagine that it is early fall in the northern arctic, and the short frenzy of the arctic summer is coming to a close. Recently hatched young shorebirds are about to embark on one of nature's most remarkable journeys. Without any help from their parents, who have already started on their own migration south, the young birds will set out on a journey of many thousands of miles, with no road map, to a distant destination they have never seen. Incredibly, shorebirds of each generation find their far-flung wintering grounds, which range from the southern coast of the United States to the most southern tip of South America. After spending the relatively mild winter season in the south, they repeat their journey back to their arctic breeding grounds to begin the cycle anew.

Along the way on these extraordinary journeys, shorebirds face increasing threats to their existence. Because they depend upon shorelines and wetlands, both coastal and along interior waterways, shorebirds are often competing with humanity for dwindling open space. Lack of habitat is compounded by increased threats from pollution of coastal and inland waters, high rates of predation, and other factors which make their journey more perilous every year.

Shorebirds occur in all 50 states, and they include the familiar sandpipers and plovers, as well as oystercatchers, avocets, and stilts. Their migrations include long-distance, non-stop flights, often exceeding a thousand miles per leg. To complete these extraordinary flights, shorebirds must lay on enormous fuel reserves. For many of the species common to North America, this is done at migration stopover areas, principally wetlands and associated habitats, which have high densities of food available at the critical times. In some cases up to 80 percent of the entire North American population of a species may visit a single site over a few weeks. The wetland habitats used by shorebirds also provide essential shelter and food for other species, including waterfowl, other avian migrants, commercial and recreationally valuable fish, and endangered and threatened species.

This Plan for the conservation of shorebirds has a simple goal: ensuring that all of our species of shorebirds are protected or restored, and that shorebirds continue to have stable populations that are capable of sustaining themselves into the long-term future. The Plan was developed by a diverse and committed group of people and organizations from across the U.S. who came together to volunteer their time and expertise to support this goal. Achieving this goal and the related objectives in this document will require ongoing and committed action on the part of all state and federal agencies that protect birds, the many non-profit organizations involved with shorebirds, as well as significantly increased understanding and involvement by the general public. Achieving these goals will ensure that future generations of people have the opportunity to marvel at these remarkable creatures as they perform one of nature's most awesome migrations each year.

An Agenda for Shorebirds

Developing a Shorebird Conservation Plan for the United States was a daunting task for a variety of biological and political reasons. Each species has different geographic breeding and non-breeding distributions, population size, and dispersion patterns. Shorebirds occur in all 50 states, and use a wide variety of habitat types. In addition, the biology and ecology of most species are poorly understood. Comprehensive planning is made even more difficult by the fact that shorebirds are highly migratory. The Shorebird Plan must take into account all situations where lands of the U.S. play critical roles for populations of shorebirds. Some species breed or winter in the U.S., while others do neither but depend upon key habitats in the U.S. for completing their migrations. Clearly, understanding basic biological characteristics of shorebirds is essential to developing sound conservation plans for their protection. Part 1 of the Plan reviews some of the biological characteristics of shorebirds that play important roles in shaping a conservation plan. To successfully address these complex conservation issues the Plan must:

- include all shorebirds that occur in the United States during breeding, non-breeding, or migration seasons;
- identify those species and populations most in need of focused national conservation efforts;
- identify those species most in need of regional conservation efforts;
- prioritize conservation objectives;
- identify mechanisms for delivery of conservation programs;
- identify mechanisms for tracking success of conservation programs;
- propose programs that can be integrated into a larger, international framework because most of the shorebirds in the United States are international migrants; and
- work within the context of the existing, successful framework of other migratory bird conservation initiatives.

Black-bellied Plovers, shown here at a migration stopover site, readily use both marine and non-marine habitats. Photo by David Twitchell.

Shorebird Biology and Conservation Planning

This section provides background on the group of species known as shorebirds, including their distribution in the U.S., and the major conservation challenges that result from their unusual biology.

Shorebird Distribution in the United States

The term shorebird is applied in North America to a large group of birds commonly called sandpipers and plovers, but also including oystercatchers, avocets, and stilts. There are 214 kinds of shorebirds world-wide, 53 of which regularly occur in the U.S. Three of these species are relatively scarce in the U.S. and breed outside of North America (Curlew Sandpiper, Sharp-tailed Sandpiper, and Ruff), and one (Purple Sandpiper) winters but does not breed in the U.S. The Shorebird Plan primarily addresses the 50 species that regularly breed or occur in the U.S. A list of additional species recorded in the U.S. is included in Appendix 4.

Thirty-seven shorebird species breed in Alaska (29 of these breed only in Alaska and not in the lower 48 states); 25 of the 37 do not breed outside of North America (three of these breed only in Alaska, while the remainder also breed in Canada). Eight species (Whimbrel, Bar-tailed Godwit, Black-bellied Plover, Red Phalarope, Red-necked Phalarope, Red Knot, Sanderling, and Ruddy Turnstone) are circumpolar breeders (Holarctic) and six (Pectoral Sandpiper, Rock Sandpiper, Long-billed Dowitcher, Western Sandpiper, Baird's Sandpiper, and Pacific Golden-Plover) breed in Alaska and eastern Siberia. There are 12 species that breed in the lower 48 but not in Alaska; six of these (Piping Plover, American Avocet, Willet, Long-billed Curlew, American Woodcock, and Wilson's Phalarope) also

breed in Canada, four breed in the U.S. and Mexico (Wilson's Plover, Snowy Plover, American Oystercatcher, and Black-necked Stilt), and one (Mountain Plover) is essentially restricted to breeding only in the U.S. A single species breeds in Hawaii, the endangered Hawaiian Stilt, but a variety of species spend the non-breeding season there.

Shorebird Conservation Challenges

This section reviews the aspects of shorebird biology that result in conservation challenges which must be addressed successfully to protect this diverse group of birds.

Red knots, Ruddy Turnstones, Sanderlings, and Semipalmated Sandpipers "refueling" on horseshoe crab eggs, whose energy will be transformed to forward feathered motion to the Canadian Arctic. Photo by David Twitchell.

Long Distance Migration

Because many shorebirds have extremely long migrations, protection efforts for critical sites must be coordinated over vast distances often involving many different countries. As a group, shorebirds undertake some of the longest-distance migrations of all animals. Pacific Golden-Plovers, Bar-tailed Godwits, and Ruddy Turnstones, for example, routinely travel more than 7,000 miles between Alaskan breeding and Australian non-breeding areas. A few species, including Snowy Plovers from Oklahoma or Rock Sandpipers from Alaska, may migrate just a few hundred miles between breeding and non-breeding habitats. However, many of the most highly migratory shorebirds use a 'long-hop' strategy, meaning that some sections of their journeys will be completed in long, non-stop flights. For example, Bar-tailed Godwits fly more than 7,000 miles across the Pacific to New Zealand without stopping for food, rest, or water. Other species may cover long migration journeys in a series of short flights. Some of the relatively short- and moderate-distance migrants also employ non-stop flights spanning from a few hundred to one or two thousand miles without stops, whereas others may have short-hop migrations.

Shorebirds have a diversity of migration routes. Although each species is different, there are three general patterns in the United States, including: migrations between Alaska and Pacific islands and continents as distant as Australia; migrations along the Pacific coast and western mountain cordilleras of North and South America, some to as far as Tierra del Fuego; and migrations to the Caribbean Basin and northeastern South America, some of which pass through central regions of the lower 48 states, and others of which are more concentrated in Atlantic coastal regions. In general - but with exceptions - the more northern-breeding species of shorebirds have longer migrations, some extending to southernmost South America. Species that breed principally in the lower 48 states generally spend the non-breeding season in the southern U.S. and Mexico, but again, there are exceptions.

Low Reproductive Potential

Shorebirds generally have low rates of reproduction, so it is difficult to reverse past declines and recover populations rapidly. Clutch sizes of almost all species are four or fewer eggs, and very few species will re-nest after a successful first nesting attempt. Predation rates of young can also be high, especially in the Arctic when lemming populations are low and food for predators is scarce, or during years when there is late snow covering breeding habitats. Shorebird populations have proven unable to withstand an improperly regulated hunting harvest. Populations of many species crashed due to excessive market and sport hunting during the late 1800's and early 1900's; some species, such as American Golden-Plover, have never recovered their historic numbers, and Eskimo Curlews may already be extinct. Only two species, the Common Snipe and the American Woodcock are still legally hunted.

Concentration

Another element of shorebird biology that raises conservation challenges is the extraordinary degree to which some species depend upon one or a small number of strategic migration stopover sites; concentration makes them extraordinarily vulnerable to environmental disruption because much of the population is in the same place at the same time.. Recognition of this special aspect of shorebird biology, and the need to devise novel conservation strategies, were the major factors driving the creation of the Western Hemisphere Shorebird Reserve Network. Documentation of concentration is costly to develop, but several examples are available. A case study of Red Knots shows that between 50 and 80 percent of the North American population stages at Delaware Bay during the spring. The population evidently depends on this stopover site for completion of northward migration into the Arctic. Survey data suggest that a number of other species also are highly dependent on small numbers of migration stopover sites. For example, during spring, most of the Buff-breasted Sandpipers recorded across the United States were at only 10 sites between the Appalachians and the Rocky Mountains. An example from the Pacific Flyway is the Western Sandpiper, where 2-4 million birds (60-80% of the population) may concentrate at the Copper River Delta in Alaska in any given year. National conservation priorities must consider the patterns of concentration at strategic migration areas in the U.S., identify which species are most at risk, and recommend appropriate regional priorities for protecting and managing strategic migration staging sites.

Dispersed and Ephemeral Habitat

Many shorebirds use habitat types, such as seasonal wetlands, that are widely dispersed across the landscape, and may be available in the same place only once every several years. Several regions within the United States where these habitat types are critical to shorebirds present special problems for efforts to monitor their numbers. The value of habitat for shorebirds in areas such as the Prairie Pothole region of the upper Midwest or the Playa Lakes region tends to be underestimated since wetlands are typically small, dispersed, and numbers of birds using any particular wetland may be small. However, when the complex of wetlands or the region is considered as a whole, numbers of birds using the area may be quite large. Additionally, these pothole wetlands, some managed wetlands, and larger alkali lakes, particularly in the Great Basin, may hold water one year and be dry the next. This causes great variance in the numbers of shorebirds using these wetlands in any particular year. Turnover rates of birds at these sites tend to be rapid. The overall effect on monitoring studies in these areas is that they need to be longer term and cover a wider area than some of the monitoring efforts at sites with predictable water resources (largely coastal) that attract large numbers of shorebirds.

Loss of Habitat

Shorebirds, like all other wildlife, need appropriate habitats to live in, including habitats for breeding, for the non-breeding season, and for migration. In many cases, strikingly different habitats are used in different seasons (e.g., many tundra-breeding species also depend on coastal habitats during migration and non-breeding seasons). Populations of almost all kinds of shorebirds have been affected by loss of essential habitat. For some species, losses of habitat have been severe in migration or non-breeding areas, whereas for others losses have been severe in breeding habitat. Some species have suffered severe habitat loss during two or more seasons.

In general, habitat loss has been very high for temperate-zone breeders, especially coastal-nesting species such as Snowy Plover and Piping Plover. Prairie-breeding shorebirds also have been affected substantially by breeding habitat loss, as prairie pothole habitat has been converted to agricultural uses. On the other hand, populations of some species such as Killdeer and Upland Sandpiper probably have increased due to human activities in some areas. In general, breeding habitat loss has been minimal in boreal- and arctic-breeding shorebirds, but there is growing concern that global warming may change this.

Loss of migration habitat also has been extensive. Coastal development and human activities in coastal zones of the U.S. have grown enormously since European settlement, reducing intertidal habitats and/or prey base used for foraging, and perhaps more importantly, usurping high tide resting areas used by shorebirds when feeding grounds

are inundated. For many kinds of shorebirds, migration stopover areas play a vital role in their ability to accumulate fat reserves, which are then spent to fuel the next leg of migration. Shorebirds unsuccessful in gaining necessary fat apparently have very low survival rates. Even where suitable habitats remain intact, they may be degraded by a wide variety of factors that limit their value for shorebirds, such as increased salinity, toxicants, or disturbance. Because the majority of shorebirds migrate southward throughout the United States during July and August, they frequently are competing with humans for coastal space during the peak of the human summer outdoor recreation season. In other situations, they are directly competing with humans for food and/or habitat resources (e.g., Red Knots and horseshoe crab harvest).

Population Change in Shorebirds

There have been no broad-scale projects designed to identify shorebird population sizes or to monitor changes in shorebird populations of North American species. Nevertheless, large habitat losses and existing data indicate that many shorebird species are likely to be experiencing significant declines. Evaluations of information from projects operated for other purposes are possible, but precision is low. Population changes need to exceed 50% before they are detectable using databases such as the International Shorebird Surveys. Nevertheless, evaluations of existing databases indicate declines in many of the species that have been examined, declines that in some cases have been large and rapid. A 1995 summary showed that more than half of the shorebird species evaluated were declining, while only one species was increasing nationally.

The U.S. Shorebird Conservation Plan provides population estimates based on a synthesis of existing information from the Western Hemisphere. While these numbers are sure to be revised, they provide a solid basis for beginning the shorebird conservation planning and monitoring processes. The Plan proposes monitoring protocols that will increase our ability to detect changes in shorebird populations. The protocols also should increase opportunities for identifying causes of population change, which heretofore have largely been elusive. Finally, improved monitoring will be essential for tracking effectiveness of the Plan itself.

Planning Across International Boundaries

Forty-nine species of shorebirds regularly breed in the United States. Table 1 summarizes their principal non-breeding distribution patterns and Figure 1 shows some of the major migratory pathways. The species that breed in the U.S spend their non-breeding seasons or migrate through no less than 41 nations (13 in South America, 7 in Central America, 3 in North America, 11 in Oceania, and Australia, New Zealand, Japan, New Guinea, Philippines, China, and Russia). An additional four species from Russia and Canada do not breed in the U.S. but use U.S. lands during non-breeding seasons. Meeting the goals of the U.S. Plan will require cooperative conservation planning and implementation with similar efforts in many other nations. Clearly, what happens to shorebirds in one part of the world may dramatically affect their status in another part.

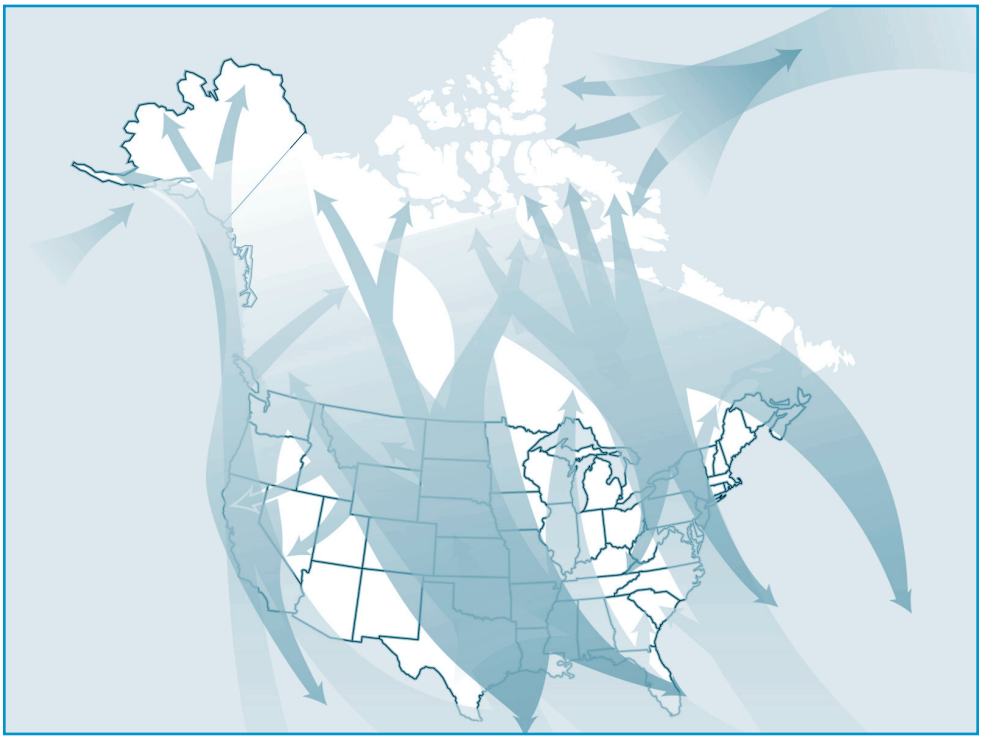
The Western Hemisphere Shorebird Reserve Network, Partners in Flight, and the North American Waterfowl Management Plan have pioneered the development of international networks for migratory bird conservation. Shorebird planning efforts have benefited from those successful models. The U.S. Shorebird Plan has been developed in close coordination with the Canadian Shorebird Conservation Plan, and also has included input from Mexico and Australia. In this process, we have formed new alliances and have provided impetus for our countries to reconfirm their commitment to migratory bird conservation.

Young shorebirds like this Semipalmated Sandpiper often migrate south on later dates than their parents, and, like other young shorebirds, will frequently use different habitats from adults. Having adequate habitat available when young migrate is an important management and conservation consideration. Photo by Dennis Paulson.

Table 1. Number of United States-breeding shorebird species showing different non-breeding distribution patterns.

NUMBER	NON-BREEDING DISTRIBUTION	SPECIES
10	Widespread Species	Black-bellied Plover, Semipalmated Plover, Greater Yellowlegs, Willet, Spotted Sandpiper, Ruddy Turnstone, Red Knot, Least Sandpiper, Sanderling, Surfbird.
8	Southern U.S. and Northern Mexico	Piping Plover, Snowy Plover, Mountain Plover, Black-necked Stilt, American Avocet, Long-billed Curlew, Black Turnstone, Marbled Godwit, Long-billed Dowitcher, Wilson's Plover.
8	Southern South America	American Golden-Plover, Upland Sandpiper, Hudsonian Godwit, White-rumped Sandpiper, Baird's Sandpiper, Pectoral Sandpiper, Wilson's Phalarope, Buff-breasted Sandpiper.
5	Oceania (including Australia and New Zealand)	Bar-tailed Godwit, Wandering Tattler, Sharp-tailed Sandpiper, Bristle-thighed Curlew, Pacific Golden-Plover.
10	Principally North America	Killdeer, American Oystercatcher, Black Oystercatcher, Purple Sanpiper, Rock Sanpiper, Dunlin, American Woodcock, Common Snipe.
7	Central America and Northern South America	Lesser Yellowlegs, Solitary Sandpiper, Whimbrel, Semipalmated Sandpiper, Western Sandpiper, Stilt Sandpiper, Short-billed Dowitcher.
2	Pelagic	Red-necked Phalarope, Red Phalarope.

Figure 1. Major routes of concentrated shorebird migration to and from the United States during spring and fall. In addition to these major pathways, shorebirds also cover much of the landscape in smaller numbers.



Part 2: A Vision for Shorebird Conservation

National Vision

The Vision of the U.S. Shorebird Conservation Plan is to ensure that stable and self-sustaining populations of all shorebirds are distributed throughout their range and diversity of habitats in the U.S. and across the Western Hemisphere, and that species which have declined in distribution or abundance are restored to their former status to the extent possible at costs acceptable to society.

Shorebird Conservation Goals

To effectively conserve the populations of North American shorebird species that occur in the United States, the U.S. Shorebird Conservation Plan must address conservation challenges at several different scales. The hemispheric goal below addresses the international cooperation necessary to conserve shorebirds throughout their range, and to ensure their survival. The national goal addresses the activities that must be undertaken within the United States to ensure that shorebird populations are not limited during their life history stages that occur here. Regional goals address the specific activities that must be undertaken to protect and manage habitats and the shorebirds that occur within each region of the country.

Roosting sites are important for shorebirds, such as these Surfbirds, because they provide an opportunity to rest while feeding areas are covered by the tides, allowing the birds to conserve the energy they will need during migration. Photo by Robert Gill.

Hemispheric Goal

Restore and maintain stable and self-sustaining populations of all species of shorebirds in the Western Hemisphere.

Appendix 1 lists current estimates of the sizes of North American shorebird populations, and target population sizes necessary to meet this goal.

Strategy 1. Develop monitoring programs to determine whether shorebird populations are declining.

Strategy 2. Focus research efforts on determining factors limiting populations of declining shorebird species, and focus international conservation efforts on reducing the effects of these limiting factors.

Strategy 3. Develop coordinated shorebird conservation efforts with Canada, Mexico, the Caribbean, Central America, South America, and Oceania/East Asia.

National Goal

Stabilize populations of all shorebird species known or suspected of being in decline due to limiting factors occurring within the U.S., while ensuring that stable populations are secure.

Strategy 1. Integrate shorebird conservation as part of a regionally-based, biologically driven, landscape-oriented, integrated migratory bird management program to deliver shorebird conservation in coordination with other migratory bird initiatives.

Strategy 2. Focus research to identify factors limiting populations of shorebirds in the U.S.

Strategy 3. Identify management actions that can ameliorate factors limiting shorebird populations in the U.S., and implement regional conservation programs to ensure that populations of shorebird species are not limited by any environmental factors within the U.S.

Common Regional Goals

Each Shorebird Planning Region (see Appendix 5) developed its own goals and objectives through the regional working group process. The specific goals and strategies developed by these groups are summarized in Part 5 of this document. In addition, the groups have collectively endorsed these common regional goals:

A. Provide sufficient high quality habitat to ensure that shorebirds in each region are not unduly limited by habitat availability or configuration.

Strategy 1. Identify and monitor key ecosystem and landscape variables that may affect shorebird use of the region (e.g., prey density, availability of roost sites, distance between high quality sites).

Strategy 2. Monitor shorebird use of available habitats to determine contributions of important sites to support of local populations of shorebirds.

Strategy 3. Coordinate management efforts for shorebirds among agencies and organizations within each region and flyway.

Strategy 4. Establish a specific habitat budget for the region, including amounts of specific habitat types that should be acquired, managed, or restored for shorebirds.

B. Ensure that efforts to provide habitat for shorebirds are integrated into multiple species habitat management initiatives where appropriate.

Strategy 1. Promote management of wetland habitats as dynamic natural systems to provide habitat for the entire range of wetland-dependent species, including shorebirds, at appropriate points in natural wetland cycles.

C. Increase understanding of how local habitat conditions affect shorebird abundance and use of a region and, in turn, how conditions affect hemispheric shorebird populations.

Strategy 1. Encourage management strategies and/or modeling exercises that will help clarify the most important determinants of shorebird use of particular habitat types.

Strategic Direction

Development of a conservation strategy for shorebirds in the U.S. has required close coordination with the other major bird conservation initiatives seeking to implement landscape-scale bird conservation, including the North American Waterfowl Management Plan, Partners in Flight, and the North American Colonial Waterbird Conservation Plan. The future of bird conservation clearly lies in the direction of implementing integrated programs that can address the needs of all birds. This section outlines the rationale for integration of shorebird conservation efforts with a broad partnership of organizations working to protect all birds.

The Role of Science in Shorebird Conservation

Effective shorebird conservation strategies must be based on sound science. The conservation goals outlined below cannot be achieved without the underlying foundation of scientific knowledge about shorebird species and the threats facing them. This scientific foundation forms the link between the broad goals laid out in this document, and the specific conservation projects that are necessary to protect bird species. Science provides both the information necessary to effectively identify critical conservation needs, and an understanding of what to do about them. Among the most important areas where information is lacking are the factors limiting the populations of each species, and the critical life history stages and geographic locations where these factors operate. For most shorebirds, this information is only partially complete, and in some cases, it is entirely lacking. In addition, we do not know whether the populations of many shorebirds are changing, and if so how quickly. We must strive to develop sound scientific information that will guide the refinement of shorebird conservation priorities, support the design and development of critical conservation projects, and help measure the effectiveness of our actions toward meeting our goals.

Bird Conservation Regions and Shorebird Planning Regions

Effective shorebird conservation requires a wide variety of habitat and species management efforts and the restoration of landscapes with suitable quantity, quality, and diversity of habitats. Programs aimed at providing for the needs of shorebirds will overlap with efforts to protect other bird species in almost every instance. Coordination of shorebird conservation efforts with those of other bird initiatives requires a common spatial language defining ecological regions where similar habitats and land uses result in similar conservation issues. The ecological framework of bird conservation regions developed jointly by all four major bird conservation initiatives in the U.S. (the North American Waterfowl Management Plan, Partners In Flight, the North American Colonial Waterbird Conservation Plan, and the U.S. Shorebird Conservation Plan) attempts to meet this goal (details are available at **http//:www.manomet.org/USSCP.htm**).

The development of geographic regions that could reflect the wide range of shorebird populations and conservation issues within the United States was a major challenge. It was even more challenging given the goal of developing regions that could organize conservation issues for all birds as part of the North American Bird Conservation Initiative (NABCI) process. Each Shorebird Planning Region is made up of NABCI Bird Conservation Regions (BCR's), and includes large areas of the country where the ecological characteristics of the landscape result in common shorebird conservation needs and issues. Appendix 5 shows the Shorebird Planning Regions and the NABCI Bird Conservation Regions contained in each Planning Region. The regional groups that developed the specific conservation goals and objectives for shorebirds in each part of the country focused on these Shorebird Planning Regions.

Planning, Implementation, and Evaluation

Integrated Planning, Implementation, and Evaluation

Effective shorebird conservation requires a dynamic process of strategic planning, project implementation, and evaluation of success. This process allows managers and scientists to move forward with critical conservation projects that will support bird species, even though they do not have all the information they would like to have. Because many conservation challenges are clear and pressing, the conservation community needs a process that supports actions known to be of high priority, and that also supports ongoing refinements and assessment of effectiveness. This process is called adaptive management.

The three components of the adaptive management approach proposed here are: 1) planning; 2) implementation; and 3) evaluation.

Planning in this context means the development of goals and objectives for specific groups of shorebirds. It is most effectively completed by the experts familiar with each species or guild, and with the complex ecological information that is already available describing the life history needs and the factors limiting the populations of shorebirds. Effective planning also requires consideration of a wide range of non-biological factors, including existing management activities, land-ownership patterns, and many other factors. The plans developed by each Shorebird Planning Region are the heart of this process. Each plan prioritizes the most important conservation actions that must be undertaken for shorebirds within the region. While the regional plans will require ongoing additions and revisions, they set the stage for a coordinated effort to achieve significant shorebird conservation. In addition, the overall national programs needed to support the regions, and to address issues of national importance, are detailed in this document.

Implementation in this context means the process of carrying out the specific conservation projects necessary to effectively protect and conserve populations of shorebirds. In contrast to planning, implementation is most effectively carried out in an integrated (i.e., multiple species groups) fashion, where the overlapping habitat and management needs of shorebirds are combined as part of an overall strategy for conservation of all birds using similar habitats at the landscape scale. The integration of implementation activities for shorebirds with conservation programs for other birds is the central vision of this Plan. Successful implementation requires the participation of a wide range of partnerships, both public and private, as described below.

Arctic-nesting American Golden-Plovers are some of the longest distance migrants of all animals; conservation and management planning must be integrated on a comparable scale. Photo by Elizabeth P Mallory.

Evaluation is the process of determining how successful each specific conservation strategy has been at achieving its overall conservation goals. It requires sound scientific information and research on shorebirds and on their habitats as conditions change. Evaluation is not an end in itself, and should never become the primary focus of the overall strategy, but is nevertheless critical to ensuring that conservation goals are being achieved. Evaluation activities span a wide range, including scientific analysis of changes in populations of shorebirds, assessments of habitat quality and availability, targeted studies where critical information is lacking that will define future priorities, and overall assessments of individual conservation programs. A successful evaluation program eventually leads to a revision of the conservation strategies described in the planning stage, as science increases our ability to understand what limits bird populations and what should be done about it.

Integrated Bird Conservation

Shared conservation needs at the landscape level

Managing the conservation of the more than 700 bird species that occur in this country would be hopelessly complex on a species by species basis. Each species may use many different habitats during the year and each habitat type often has unique management issues. However, at the scale of landscapes, the needs of many different bird species are similar. Combining management needs for species that use the same types of habitat in the landscape increases the efficiency of management, reduces costs, and increases the effectiveness of specific projects by addressing the needs of a variety of birds simultaneously.

Integrating the needs of many bird species is not an easy task. Detailed plans are required for each group of species. Therefore, it is important that each initiative, based on a specific group of birds, continues to provide the best information possible about what is needed for those species. In addition, integration requires a focused effort

to look for overlapping opportunities for habitat conservation. In some cases, there will be conflicts among the needs of different bird species that share habitats; creative approaches to ensuring that all species are protected then will be critical. Overall, the challenge of integrating bird conservation for multiple species groups will yield significant benefits in terms of the efficiency of the conservation achieved on the ground, and the broad base of support that can be generated for bird conservation by working together.

Integrated Conservation Delivery

All conservation is ultimately local. The regional shorebird working groups formed as part of the Plan provide the expertise necessary to guide the successful delivery of shorebird conservation in their respective regions. The wide range of public and private organizations operating in each part of the country are the most knowledgeable about local conditions and needs and should work cooperatively with regional planning efforts for all groups of birds. The Shorebird Plan should be implemented in full cooperation with the North American Bird Conservation Initiative because it advances the vision of regionally-based partnerships that build on local knowledge and enthusiasm to deliver conservation activities for all groups of birds.

The most critical step in achieving integration is determining where the goals and objectives of initiatives for different bird groups overlap. The regional partnerships should be the focus for efforts to assemble the various plans for different groups of birds, and for determining how best to apply them. Integration will require different approaches in each part of the country, depending on the specific birds that occur, the threats to various habitat types, and the range of existing conservation activities already taking place. Allowing each regional partnership to determine its own course toward integration will ensure full and active participation by regional and local organizations.

Shorebird Plan Revision Schedule

The U.S. Shorebird Conservation Plan was developed with active participation from most of the organizations and individuals working to protect and learn more about shorebirds, and represents the best information available about priority education, research, monitoring, and management needs. However, many gaps in our knowledge of these birds and their needs have been identified. Developing better approaches and increasing funding to obtain the missing information are the subjects of many of the recommendations presented here. As more information becomes available in upcoming years, there will be a need to systematically revisit the recommendations and goals laid out here. This will ensure that they are modified to represent the best available scientific information. For this reason, the Plan partnership recommends that the U.S. Shorebird Conservation Plan be revised every five years over the next 15 years, and thereafter as determined to be necessary.

American Oystercatchers have a relatively small population estimated at only 7,500, which makes them more vulnerable than species with similar threats but larger populations. Photo by Brad Winn.