

Appendix 1.

United States Shorebird Conservation Plan - Executive Summary (from Brown et al. 2001)

The U.S. Shorebird Conservation Plan is a partnership involving organizations throughout the United States committed to the conservation of shorebirds. This document summarizes all of the major technical reports and recommendations produced by the various working groups that participated in developing the Plan. The organizations and individuals working on the Plan have developed conservation goals for each region of the country, identified critical habitat conservation needs and key research needs, and proposed education and outreach programs to increase awareness of shorebirds and the threats they face. The shorebird partnership created during the development of the Plan will remain active and will work to improve and implement the Plan's recommendations.

Natural landscapes in the United States have been altered significantly, and the wetlands, shoreline habitats, and grasslands used by shorebirds have been particularly disturbed. For many shorebird species, existing information is insufficient to determine how these alterations have affected populations. Many shorebird species face significant threats from habitat loss, human disturbance, and from different forms of habitat degradation such as pollution, prey resource depletion, and increasing threats from predators. Despite ongoing conservation efforts, many shorebird populations are declining, in some cases at alarming rates. Because development pressure will continue, critical conservation actions must be identified, integrated management practices must be developed, and ongoing changes in habitat configuration, quality, and availability must be controlled. Focused conservation action is needed now to protect and restore necessary habitats and address other threats to prevent additional shorebird species from becoming threatened or endangered.

The Plan has three major goals at different scales. At a regional scale, the goal of the Plan is to ensure that adequate quantity and quality of habitat is identified and maintained to support the different shorebirds that breed in, winter in, and migrate through each region. At a national scale, the goal is to 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 common species are also protected from future threats. At a hemispheric scale, the goal is to restore and maintain the populations of all shorebird species in the Western Hemisphere through cooperative international efforts.

The Plan was developed by a wide array of state and federal agencies, non-governmental conservation organizations, and individual researchers throughout the country. Major partners include all 50 States, the U.S. Fish and Wildlife Service, the North American Waterfowl and Wetlands Office, most of the Joint Ventures established through the North American Waterfowl Management Plan, the Bureau of Land Management, the U.S. Geological Survey, the USDA Forest Service, the International Association of Fish and Wildlife Agencies, The Nature Conservancy, National Audubon Society, Ducks Unlimited, the Canadian Wildlife Service, the Western Hemisphere Shorebird Reserve Network, Point Reyes Bird Observatory, and many other regional organizations. Manomet Center for Conservation Sciences initiated the project, obtained the funding to develop the Plan, and hired the coordinators who oversaw all aspects of the project to date as well as publication of these reports.

Three major working groups were formed at a national level. The research and monitoring group developed scientifically sound approaches for tracking populations of shorebirds, identified the critical research questions that must be answered to guide conservation efforts, and determined funding requirements to meet these needs. The habitat management group worked with the regional groups to assemble specific regional habitat management goals into a national program. The education and outreach group focused on development of materials for schools and public education programs to help build awareness of shorebirds and the risks facing them throughout the country, and identified areas where increased funding for education and outreach are needed.

Eleven regional groups were formed during the development of the Plan. The major focus of these

groups was to determine what habitats need to be protected and managed to meet the requirements of the shorebirds in each region. Each group set its own regional goals and objectives, and collected information about ongoing management efforts and how they can be improved. In addition, the regional groups provided input to the development of the research and monitoring programs, and helped identify education and outreach needs.

The loss of wetland habitat in the U.S. has motivated federal, state, and private agencies to increase conservation and management of wetlands to preserve the public values of these critical habitats. Wetland management and restoration have developed rapidly in recent years, and the North American Waterfowl Management Plan has stimulated significant increases in funding for wetland conservation activities. There is growing recognition among land managers of the opportunity to integrate management practices beneficial to shorebirds and other waterbirds into current management practices focused predominantly on game species. This changing orientation reflects the rapidly growing number of people who engage in bird watching, wildlife photography, and ecotourism in addition to traditional activities such as fishing and hunting. This growing constituency brings substantial economic benefits to wetlands and waterfowl areas, and has broadened public support for wetland conservation. We need management practices to focus on entire landscapes, but this requires an unprecedented level of coordination among multiple partners. No single conservation initiative can be effective alone. Wetland conservation for wildlife across entire landscapes requires the coordination of multiple efforts. The Shorebird Conservation Plan represents a significant contribution to the development of landscape-level wildlife conservation, and can contribute significantly to these larger goals as part of a broad partnership for wetland conservation.

The Shorebird Plan is designed to complement the existing landscape-scale conservation efforts of the North American Waterfowl Management Plan, Partners in Flight, and the North American Colonial Waterbird Conservation Plan. Each of these initiatives addresses different groups of birds, but all share many common conservation challenges. One major task is to integrate these efforts to ensure coordinated delivery of bird conservation on the ground in the form of specific habitat management, restoration, and protection programs. The newly developing North American

Bird Conservation Initiative addresses conservation needs for all birds in North America, and the Shorebird Plan partnership will work closely with this initiative toward common goals.

Each partner organization involved in the Shorebird Plan will take on implementation roles suited to its focus and skills. The U.S. Shorebird Plan Council, which includes representatives of all partners in the Plan, will coordinate implementation. Major implementation partnerships are being set up with interested Joint Ventures organized under the North American Waterfowl Management Plan and with Partners in Flight. International coordination is also underway between the U.S. Shorebird Plan and the Canadian Shorebird Conservation Plan, which share responsibility for many of the same species at different points in their annual cycles. These partnerships will work to ensure that all of the recommendations provided in this document and the accompanying technical reports are addressed, and to ensure that stable and self-sustaining shorebird populations are maintained into the distant future.

Appendix 2.

Scientific Names of Shorebirds

Scientific Name

Actitis hypoleucos
Arenaria interpres
Calidris acuminata
Calidris alba
Calidris alpina
Calidris bairdii
Calidris canutus
Calidris ferruginea
Calidris himantopus
Calidris mauri
Calidris melanotos
Calidris minuta
Calidris minutilla
Calidris pusilla
Calidris ruficollis
Calidris subminuta
Calidris temmickii
Calidris tenuirostris
Catoptrophorus semipalmatus
Charadrius alexandrinus
Charadrius dubius
Charadrius hiaticula
Charadrius leschenaultii
Charadrius mongolus
Charadrius morinellus
Charadrius semipalmatus
Charadrius veredus
Charadrius vociferus
Gallinago gallinago
Gallinago hardwickii
Gallinago megala
Gallinago stenura
Haematopus ostralegus
Heteroscelus brevipes
Heteroscelus incanus
Himantopus mexicanus
Himantopus mexicanus mexicanus
Himantopus mexicanus knudseni
Himantopus himantopus
Himantopus leucocephalus
Himantopus melanurus
Himantopus novaezelandiae
Limicola falcinellus
Limnodromus griseus
Limnodromus scolopaceus
Limosa fedoa

Common Name

Common Sandpiper
Ruddy Turnstone
Sharp-tailed Sandpiper
Sanderling
Dunlin
Baird's Sandpiper
Red Knot
Curlew Sandpiper
Stilt Sandpiper
Western Sandpiper
Pectoral Sandpiper
Little Stint
Least Sandpiper
Semipalmated Sandpiper
Red-necked Stint
Long-toed Stint
Temminck's Stint
Great Knot
Willet
Snowy Plover
Little Ringed Plover
Common Ringed Plover
Greater Sand-Plover
Mongolian Plover
Eurasian Dotterel
Semipalmated Plover
Oriental Plover
Killdeer
Wilson's Snipe
Japanese (Latham's Snipe)
Swinhoe's Snipe
Pin-tailed Snipe
Eurasian Oystercatcher
Grey-tailed Tattler
Wandering Tattler
Black-necked Stilt
North American Black-necked Stilt
Hawaiian Stilt
Black-winged Stilt
White-headed Stilt
Black-backed Stilt
Black Stilt
Broad-billed Sandpiper
Short-billed Dowitcher
Long-billed Dowitcher
Marbled Godwit

Appendix 2. Continued

Scientific Name

Limosa haemastica
Limosa lapponica
Limosa limosa
Numenius arquata
Numenius madagascariensis
Numenius minutus
Numenius phaeopus variegatus
Numenius tahitiensis
Phalaropus fulicaria
Phalaropus lobatus
Phalaropus tricolor
Philomachus pugnax
Pluvialis fulva
Pluvialis squatarola
Prosobonia cancellata
Tringa erythropus
Tringa flavipes
Tringa glareola
Tringa guttifer
Tringa melanoleuca
Tringa nebularia
Tringa ochropus
Tringa solitaria
Tringa stagnatilis
Tryngites subruficollis
Xenus cinereus

Common Name

Hudsonian Godwit
Bar-tailed Godwit
Black-tailed Godwit
Eurasian Curlew
Far Eastern Curlew
Little Curlew
Asiatic Whimbrel
Bristle-thighed Curlew
Red Phalarope
Red-necked Phalarope
Wilson's Phalarope
Ruff
Pacific Golden-Plover
Black-bellied Plover
Tuamotu Sandpiper
Spotted Redshank
Lesser Yellowlegs
Wood Sandpiper
Nordmann's Greenshank
Greater Yellowlegs
Common Greenshank
Green Sandpiper
Solitary Sandpiper
Marsh Sandpiper
Buff-breasted Sandpiper
Terek Sandpiper

Appendix 3.

U.S. Pacific Islands Covered in the USPI Shorebird Conservation Plan

<u>Subregion/Island Name</u>	<u>Type</u>	<u>Archipelago</u>	<u>Group</u>	<u>Political Status</u>	<u>Administration</u>	<u>Special Status</u>
HAWAII SUBREGION						
Hawaii						
Hawai'i	Basalt Island	Hawaiian	Main Hawaiian Islands	State of Hawaii	State of Hawaii	
Maui	Basalt Island	Hawaiian	Main Hawaiian Islands	State of Hawaii	State of Hawaii	
Kaho'olawe	Basalt Island	Hawaiian	Main Hawaiian Islands	State of Hawaii	State of Hawaii	former military bomb range
Lana'i	Basalt Island	Hawaiian	Main Hawaiian Islands	State of Hawaii	Kaho'olawe Commission	
Moloka'i	Basalt Island	Hawaiian	Main Hawaiian Islands	State of Hawaii	State of Hawaii	
O'ahu	Basalt Island	Hawaiian	Main Hawaiian Islands	State of Hawaii	State of Hawaii	
Kaua'i	Basalt Island	Hawaiian	Main Hawaiian Islands	State of Hawaii	State of Hawaii	
Ka'uila	Basalt Island	Hawaiian	Main Hawaiian Islands	State of Hawaii	State of Hawaii	State Seabird Sanctuary former military bomb range
Ni'ihau	Basalt Island	Hawaiian	Main Hawaiian Islands	State of Hawaii	State of Hawaii; privately owned	
Niihoo	Basalt Island	Hawaiian	Leeward Hawaiian Islands	State of Hawaii	USFWS	National Wildlife Refuge
Necker	Basalt Island	Hawaiian	Leeward Hawaiian Islands	State of Hawaii	USFWS	National Wildlife Refuge
French Frigate Shoal <i>comprised of 10-12 sandy islets & 1 basalt pinnacle</i>	Atoll	Hawaiian	Leeward Hawaiian Islands	State of Hawaii	USFWS	National Wildlife Refuge; former Coast Guard Station
Gardener Pinnacles	Basalt Island	Hawaiian	Leeward Hawaiian Islands	State of Hawaii	USFWS	National Wildlife Refuge
Maro Reef	Atoll-like reef	Hawaiian	Leeward Hawaiian Islands	State of Hawaii	USFWS	National Wildlife Refuge
Laysan	Coral Island	Hawaiian	Leeward Hawaiian Islands	State of Hawaii	USFWS	National Wildlife Refuge
Lisianski & Neva Shoal	Coral Island & atoll-like reef	Hawaiian	Leeward Hawaiian Islands	State of Hawaii	USFWS	National Wildlife Refuge
Pearl and Hermes Reef <i>comprised of 7 islets</i>	Atoll	Hawaiian	Leeward Hawaiian Islands	State of Hawaii	USFWS	National Wildlife Refuge
Kure <i>comprised of 4 islets</i>	Atoll	Hawaiian	Leeward Hawaiian Islands	State of Hawaii	State of Hawaii	State Seabird Sanctuary former Coast Guard
Midway Atoll	Atoll	Hawaiian	Leeward Hawaiian Islands	unincorporated unorganized insular area	USFWS	National Wildlife Refuge former Naval Station
AMERICAN SAMOA SUBREGION						
American Samoa						
Tutu'ila	Basalt Island	Samoa		unincorporated, unorganized territory	American Samoa Government	
Aunu'u	Basalt Island	Samoa			American Samoa Government	
Ta'u	Basalt Island	Samoa	Manua Islands		American Samoa Government	
Oftu	Basalt Island	Samoa	Manua Islands		American Samoa Government	
Olosega	Basalt Island	Samoa	Manua Islands		American Samoa Government	
Swains <i>(To'elau Lata Ma'i)*</i>	Coral Island	Tokelau	* Samoan names for Swains Island and Rose Atoll		American Samoa Government	
Rose <i>(Ni'u Mamu)*</i>	Atoll	Samoa			USFWS	National Wildlife Refuge

Appendix 3. Continued

<u>Island Name</u>	<u>Type</u>	<u>Archipelago</u>	<u>Group</u>	<u>Political Status</u>	<u>Administration</u>	<u>Special Status</u>
MARIANA ISLANDS SUBREGION						
Commonwealth Northern Mariana Islands (CNMI)						
Farallon de Pajaros	Basalt Island	Mariana		commonwealth in political union with United States	CNMI Government	
Maug	Basalt Island	Mariana			CNMI Government	Seabird Sanctuary
<i>comprised of 3 islands</i>						
Ascension	Basalt Island	Mariana			CNMI Government	
Agrihan	Basalt Island	Mariana			CNMI Government	
Pagan	Basalt Island	Mariana			CNMI Government	
Alamagan	Basalt Island	Mariana			CNMI Government	
Guguan	Basalt Island	Mariana			CNMI Government	
Sarigan	Basalt Island	Mariana			CNMI Government	
Anatahan	Basalt Island	Mariana			CNMI Government	
Farallon de Medinilla	Limestone Island	Mariana			CNMI Government	
Saipan	Limestone/Basalt Island	Mariana			CNMI Government	military bomb range
Tinian	Limestone Island	Mariana			CNMI Government	
Aguijan	Limestone Island	Mariana			CNMI Government	
Rota	Limestone/Basalt Island	Mariana			CNMI Government	
Guam						
	Limestone/Basalt Island	Marian		unincorporated organized territory	Guam Government	
Cocos	Coral Island	Mariana	Guam		Guam Government	
CENTRAL PACIFIC ISLANDS SUBREGION						
Johnston Atoll	Atoll			unincorporated unorganized territory	jointly administered: USFWS & Defense Threat Reduction Agency	National Wildlife Refuge; military base
<i>comprised of 4 islets</i>						
Wake Island	Atoll	Marshall		unincorporated territory	Air Force/Dept of Interior	Air Force Base
<i>comprised of 3 islets</i>						
Palmyra	Atoll	Line		incorporated territory	USFWS & The Nature Conservancy	National Wildlife Refuge; TNC Reserve
<i>comprised of 54 islets</i>						
Kingman Reef	Atoll	Line		possession	USFWS	National Wildlife Refuge
Jarvis Island	Atoll	Line		possession	USFWS	National Wildlife Refuge
Baker Island	Coral Island	Phoenix		possession	USFWS	National Wildlife Refuge
Howland Island	Coral Island	Phoenix		possession	USFWS	National Wildlife Refuge

Appendix 4.

Status and Regional Occurrence of Shorebirds in the U.S.P.I.

TABLE 1. Migratory Shorebird Species List, U.S. Pacific Islands - Circumpolar, Holarctic Breeders (Asia and North America).

Species	Hawaiian Islands	Mariana Islands	Central Pacific Islands	American Samoa
Pacific Golden-Plover	MW	MW	MW	MW
Black-bellied Plover	mw	*	*	
Snowy Plover		*		
Whimbrel	*	mw	*	*
Bar-tailed Godwit	*	*	*	*
Ruddy Turnstone	MW	mw	mw	mw
Red Knot	*			
Sanderling	MW	*	mw	m
Dunlin	mw	*	*	
Long-billed Dowitcher	mw		*	
Common Snipe	*	*	*	
Red-necked Phalarope	*			
Red Phalarope	*		*	

TABLE 2. Migratory Shorebird Species List, U.S. Pacific Islands - Nearctic Breeding Species.

Species	Hawaiian Islands	Mariana Islands	Central Pacific Islands	American Samoa
Semipalmated Plover	*		*	
Killdeer	*			
Greater Yellowlegs	*	*	*	
Lesser Yellowlegs	mw		*	
Solitary Sandpiper	*			
Willet			*	
Wandering Tattler	MW	mw	MW	MW
Spotted Sandpiper	*		*	
Bristle-thighed Curlew	MW	*	MW	mw
Hudsonian Godwit	*			
Marbled Godwit	*			
Semipalmated Sandpiper	*			
Western Sandpiper	*		*	
Least Sandpiper	mw			
Baird's Sandpiper	*			
Pectoral Sandpiper	m	*	m	
Buff-breasted Sandpiper	*		*	
Stilt Sandpiper	*			
Short-billed Dowitcher	*			
Wilson's Phalarope	*			

Appendix 4. Continued

TABLE 3. Migratory Shorebird Species List, U.S. Pacific Islands - Palearctic Breeding Species.

Species	Hawaiian Islands	Mariana Islands	Central Pacific Islands	American Samoa
Mongolian Plover	*	mw		
Greater Sand-Plover	*	*		
Common Ringed Plover	*	*		
Little Ringed Plover		*		
Oriental Plover				
Eurasian Dotterel	*			
Eurasian Oystercatcher		*		
Black-winged Stilt	*	*		
Common Greenshank		*		
Marsh Sandpiper	*	*		
Spotted Redshank		*		
Nordmann's Greenshank		*		
Green Sandpiper		*		
Wood Sandpiper	*	mw		
Grey-tailed Tattler	*	mw	*	
Common Sandpiper	*	mw	*	
Terek Sandpiper		*		
Little Curlew		*		
Far Eastern Curlew	*	*		
Eurasian Curlew		*		
Black-tailed Godwit	*	*		
Great Knot		*		
Little Stint	*	*		
Red-necked Stint	*	mw		
Temminck's Stint		*		
Long-toed Stint	*	*		
Sharp-tailed Sandpiper	m	*	m	
Curlew Sandpiper	*	*		
Ruff	*	*	*	
Pin-tailed Snipe	*	*		
Japanese (Latham's) Snipe		*		
Swinhoe's Snipe		*		

Appendix 4. Continued

TABLE 4. List of Species Occurring in the U.S. Pacific Islands - Where U.S. Pacific Islands are of Minor Importance to North American Breeding Species. Conservation Actions will have Little Impact on Overall Population Levels.

Species	Status	Population Trends in Pacific Islands
Black-bellied Plover	Winter Visitor	Unknown
Semipalmated Plover	Transient	Unknown
Lesser Yellowlegs	Transient	Unknown
Bar-tailed Godwit	Transient	Unknown
Western Sandpiper	Winter Visitor	Unknown
Least Sandpiper	Winter Visitor	Unknown
Pectoral Sandpiper	Transient	Unknown
Dunlin	Winter Visitor	Unknown
Long-billed Dowitcher	Winter Visitor	Unknown
Common Snipe	Winter Visitor	Unknown
Wilson's Phalarope	Transient	Unknown

TABLE 5. List of Species Occurring in U.S. Pacific Islands - Where the U.S. Pacific Islands are of Minor Importance to Asian Breeding Species. Conservation Actions will have Little Impact on Overall Population Levels.

Species	Status	Population Trends in Pacific Islands
Gray-tailed Tattler	Winter Visitor	Unknown
Sharp-tailed Sandpiper	Transient	Unknown
Ruff	Transient	Unknown
East Asian Whimbrel	Winter Visitor	Unknown
Mongolian Plover	Winter Visitor	Unknown
Rufous-necked Stilt	Winter Visitor	Unknown
Wood Sandpiper	Winter Visitor	Unknown

Appendix 5.

Prioritization Scores - Shorebirds of Primary Conservation Importance in the U.S. Pacific Islands

PRIORITIZATION SCORES - Shorebirds of primary conservation importance in the U.S. Pacific Islands.

Species	PT	RA	TB	TN	BD	ND	Area Importance	Conservation Category
Pacific Golden-Plover	U	5	2	2	5	4	5	4
Hawaiian Stilt	3	5	5	5	5	5	5	5
Bristle-thighed Curlew	U	5	2	4	5	3	5	4
Wandering Tattler	U	5	2	2	3	2	4	3
Ruddy Turnstone	U	3	2	2	2	2	3	2

U.S. Pacific Island shorebirds were ranked according to the criteria used in the U.S. Shorebird Conservation Plan (Brown et al. 2002) and defined in the National Shorebird Conservation Assessment (Brown et al. 2000). The section on Shorebird Species Conservation Priorities is excerpted below, from Brown et al. (2001).

Shorebird Species Conservation Priorities (from Brown et al. 2000)

National Shorebird Conservation Priorities

This system for prioritizing shorebird species of concern was developed as part of the U.S. Shorebird Conservation Plan with input from many individuals participating in the Research and Monitoring working group, including representatives from across the country and from Canada. The goal of the system is to provide a clearly organized method for categorizing the various risk factors that affect the conservation status of each species in a format that can be easily updated as additional information becomes available. The system was designed in collaboration with Partners In Flight to ensure that it was as compatible as possible with existing approaches to bird species prioritization (Carter et al. 2000), while reflecting the unique conservation risks for shorebirds. Modifications suggested by Beissinger et al. (2000), including the use of categories for species priorities, were incorporated.

Even though there is widespread agreement that the variables used in this system affect the conservation status of bird species, they are difficult to estimate. Nevertheless, prioritization is important to ensure that species more at risk are given the attention needed to avoid significant declines. Because appropriate data is often lacking, the classifications produced by this system are considered estimates of the actual conservation status of each species. Further study is needed for

most species with respect to most of these variables. The classifications presented here will be revised at regular intervals as appropriate, and should not be considered final. Current national priority scores for each species and subspecies are presented in Appendix 5.

Variables for National Priorities

1) Population Trend, PT, and Population Trend Uncertainty, PTU

The population trend variable uses existing information on shorebird trends to estimate broad categories of population decline. Species with known declines in populations are likely to be at higher risk than species where ongoing study has detected no risk. However, many species may be declining even though trends have not been detected using current monitoring techniques. This is particularly true for species under-represented in ongoing monitoring programs. Only species with documented significant population declines ($p < 0.10$) are included in category 5.

PT

- 5 Significant population decline ($p < 0.10$)
- 4 Apparent population decline
- 3 Apparently stable population or status unknown*
- 2 Apparent population increase
- 1 Significant population increase

*Note: If the population trend cannot be classified at all due to the lack of appropriate data, the PT score is represented as “U” for Unknown.

Population Trend Uncertainty rates the relative level of uncertainty associated with the estimate of population. We rate uncertainty scores on a scale of 1-5. These scores emphasize the need for additional monitoring, and uncertainties associated with decisions based on reported trends, but do not enter into the categorization process for determining conservation priorities. High uncertainty about the trend estimate results in a high score. For the purposes of determining how representative available data are for the entire species, the data are classified into one of two categories: 1) comprehensiveness high = data estimated to represent more than half of the species range and/or half of the estimated population; or 2) comprehensiveness low = data represent less than half of both. Scores for these uncertainty estimates are being developed.

PTU

- 5 No information about population trend
- 4 Significance test has medium or low power (<0.8) and comprehensiveness is low; or, no data but informed estimates about population trend possible
- 3 Significance test has medium or low power (<0.8), and comprehensiveness is high
- 2 Significance test has high power (>0.8), but comprehensiveness is low
- 1 Significance test has high power (>0.8), and comprehensiveness is high

2) Relative Abundance, RA

This variable uses population size estimates to classify each species into 5 categories based on breaks in the distribution of population sizes among shorebirds. Species with smaller absolute population sizes are likely to be more at risk, either as a result of historic declines or from catastrophic disturbances. Population estimates were developed by Morrison et al. (ms.). For some species the population estimates may be low due to lower counts resulting from higher dispersion. For these species, the estimates may be inaccurate. However, most of these species are near the midpoints of their categories, so this factor may not result in misclassification. With increasing data about current population sizes, these estimates will be revised.

RA

- 5 <25,000
- 4 25,000 - <150,000
- 3 150,000 - <300,000
- 2 300,000 - <1,000,000
- 1 >1,000,000

3) Threats During Breeding Season, TB

This variable ranks the threats known to exist for each species, and the categories reflect the limited knowledge available for determining threats to most shorebirds. Species are scored as follows:

TB

- 5 Known threats are actually occurring (i.e. significant loss of critical habitat), and can be documented.
- 4 Significant potential threats exist (i.e. oil spills) but have not actually occurred
- 3 No known threats, or information not available
- 2 Threats assumed to be low
- 1 Demonstrably secure

4) Threats During Non-breeding Season, TN

This score uses the same criteria listed above for TB scores, with the additional factor of concentration risk explicitly considered as follows:

TN

- 5 Known threats are actually occurring (i.e. significant loss of critical habitat), and can be documented. Concentration results in actual risk.
- 4 Significant potential threats exist (i.e. oil spills) but have not actually occurred. Concentration results in high potential risk.
- 3 No known threats, or concentration not a risk, or information not available
- 2 Threats assumed to be low from all factors including concentration
- 1 Demonstrably secure

5) Breeding Distribution, BD

This variable ranks the size of the breeding range for species that breed in North America, and only applies during the actual breeding season. The assumption is that species with relatively more restricted ranges are more susceptible to breeding failure from natural or human-induced causes. Threats that occur during migration to or from the breeding grounds are addressed in ND below.

BD

- 5 <2.5% of North America (212,880 sq. mi., or 551,493 km²)
- 4 2.5-4.9% of North America
- 3 5-9.9% of North America
- 2 10-20% of North America
- 1 >20% of North America (1,703,008 sq. mi., or 4,411,940 km²)

6) Non-breeding Distribution, ND

This variable refers to distribution during the non-breeding season, which includes migration to and from the breeding grounds. Threats resulting from concentration at some point during migration are addressed in TN above. This variable rates the relative risks associated with having a smaller absolute range size during the non-breeding season. Because different risk factors occur during the non-breeding season, the absolute sizes of these categories are different from those for BD. In addition, the added variable of length of coastline is used for coastal species where measuring area is not as representative of distribution.

ND

- 5 Highly restricted <50,000 sq. mi., or very restricted coastal areas, or interior uplands,
- 4 Local = 50,000 - 200,000 sq. mi., or <1,000 mi. of coast
- 3 Intermediate = 200,000 - 2,000,000 sq. mi., or along 1,000 - 3,000 mi. of coast
- 2 Widespread = 2,000,000 - 4,000,000 sq. mi., or along 3,000 - 5,000 mi. of coast
- 1 Very widespread = 4,000,000 - 7,000,000 sq. mi., or along 5,000 - 9,000 mi. of coast

Criteria for National Priorities

The following categories are modified from those proposed in Beissinger et al. (ms.), developed by the AOU committee established to review the PIF prioritization system. The primary change is to move species with high PT scores and some other high score into the highest category. In addition,

Priority Categories:

5) Highly Imperiled

All species listed as threatened or endangered nationally, plus all species with significant population

declines and either low populations or some other high risk factor.

- a. PT=5 and RA, BD, TB, or TN=5

4) Species of High Concern

Populations of these species are known or thought to be declining, and have some other known or potential threat as well:

- a. PT = 4 or 5 and either RA, BD, TB, or TN = 4 or 5
- b. RA = 4 or 5 and either TB or TN = 4 or 5
For regional lists only:
- c. AI = 5 and RA >3

3) Species of Moderate Concern

Populations of these species are either a) declining with moderate threats or distributions; b) stable with known or potential threats and moderate to restricted distributions; c) and d) relatively small and restricted; or e) declining but with no other known threats.

- a. PT = 4 or 5 and RA, BD, ND, TN, or TB = 3
- b. PT = 3 and RA, BD, ND, TN, or TB = 4 or 5
- c. RA = 3 and BD or ND = 4, or 5
- d. RA = 4 and BD and ND <4
- e. PT=5 and RA, BD, ND, TN, or TB > 1
For regional lists only
- f. AI=4 and RA>3

2) Species of Low Concern

Populations of these species are either a) stable with moderate threats and distributions; b) increasing but with known or potential threats and moderate to restricted distributions; or c) of moderate size.

- a. PT = 3 and RA, BD, ND, TN, or TB=3
- b. PT = 2 and RA, BD, ND, TN, or TB=4 or 5
- c. RA = 3
For regional lists only:
- d. AI = 3

1) Species Not at Risk

All other species

Regional Shorebird Conservation Priorities

Variables for Regional Priorities

Considering area importance at the regional scale ensures that conservation effort will not be misdirected toward species that are rare in a particular region only because it is close to the edge of their range. Regional shorebird groups have also assessed the relative importance to each shorebird species of each Bird Conservation Region (Appendix 7), which are the smaller areas within Planning Regions (i.e. the Mississippi Alluvial Valley BCR and the Gulf Coast BCR are both within the Lower Miss./Western Gulf Coast Planning Region). Regional priorities have been calculated by the regional groups, and are presented in their individual regional reports. Area importance within each BCR can be used for finer scale planning and prioritization needs within BCR's.

1) Area Importance, AI

Area importance scores are based on knowledge of distributions, expert opinion, and data on distributions for species where it is available. Species are ranked on a relative scale within each BCR.

Because management decisions based on species priorities must often be conducted at appropriate seasons, the scores for these variables are reported using a system that reflects both the relative area importance and the season or seasons during which the area is important, including breeding, wintering, and migration (spring and fall). This system is used at two scales, for describing the importance of both the Shorebird Planning Regions and also the smaller Bird Conservation Regions included in each Planning Region.

For each score, a description is provided of the frequency of occurrence within BCR or Planning Region, including relative abundance, importance relative to other regions, and importance of management and protection activities.

Score Symbol

5 **B, W, M**

High concentrations known to occur. Area of high importance to the species relative to the majority of other regions. The area is critical for supporting hemispheric populations of the species.

4 **B, W, M**

Common or locally abundant, with large numbers occurring or suspected to occur. Area of known or suspected importance relative to other regions, especially within the same flyway. The area is important to supporting hemispheric or regional populations.

3 **b, w, m**

Uncommon to fairly common. Area is within the primary range of the species, and it occurs regularly, but the species is present in low relative abundance.

2 *

Rare occurrences. Area is within the expected range of the species, but it occurs at a low frequency. (In general, management for these species is not warranted within the region.)

1 **Blank**

Does not occur in the area, or only unpredictable, irregular occurrence as a vagrant. Area is outside of expected range.

Criteria for Regional Priorities

The regional prioritization system uses the same criteria as for national priorities, with the additional rule that species can be assigned to a different category based on their area importance within the region. In addition, regions may remove species from their lists if the regional area importance score is less than 3 to ensure that conservation priority is given to species with significant populations within the region. For simplicity, the criteria are listed above with the national criteria lists, under the regional headings for categories 2, 3, and 4. Species in the highest conservation category are high priority wherever they occur. Each region determined whether to leave species with AI scores less than 3 off their regional priority lists to concentrate conservation effort on the species with higher area importance.

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