Photo: Melissa Bimbi

Nonbreeding Piping Plover Conservation Workshop Proceedings

Fernandina Beach, Florida 32034

December 7–9, 2010

Compiled by:
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Monday, December 6		
Registration open from 4:00-8:00 pm		
Tuesday, December 7		
Registration open from 7:30-8:15 am		
Time	**Topic**	**Presenter(s)**
8:30-8:45	Welcome and Introductions	Melissa Bimbi and Walker Golder
8:45-9:10	Piping Plover Status Review – Population Status	Anne Hecht
9:15-9:45	Northern Great Plains Recovery Plan	Carol Aron and David Newstead
9:50-10:15	Piping Plover Status Review – Current Threats On Migration And Winter Grounds	Robyn Cobb
10:15-10:30	***Break***	
10:30-10:55	Non-breeding Piping Plover Comprehensive Conservation Strategy (CCS)	Karen Terwilliger
11:00-11:25	International Cooperation For Shorebird Conservation	Brad Andres
11:30-12:00	Overview Of Sea-Level Rise And Coastal Landform Evolution	Ben Gutierrez
12:00-1:15	***Lunch***	***On your own***
1:15-1:35	Piping Plover In Eastern Canada: Recovery Links To The Wintering Grounds	Andrew Boyne
	Session 1: Gulf Oil Spill	
1:40-2:00	Effects Of A Recent Oil Spill On Louisiana Coastal Birds	Michael Seymour
2:05-2:25	Assessing The Impact Of The Deep Water Horizon Oil Spill On Piping Plovers	Dan Catlin and Jim Fraser
2:25-2:45	Session 1 CCS Talking Points	Karen Terwilliger
2:45-3:00	***Break***	
	Session 2: Regulatory Mechanisms	
3:05-3:25	Adequacy of Existing Regulatory Mechanisms	Patty Kelly
3:30-3:50	Municipal And Community-Based Beach Management Plans In New Jersey	Stephanie Egger and Todd Pover
3:55-4:15	South Carolina Case Studies: Incorporating Recovery and Section 7	Melissa Bimbi
4:15-4:30	Session 2 CCS Talking Points	Karen Terwilliger
	Adjourn	

5:30-7:30	Social and Poster Session	Melissa Bimbi and Walker Golder
Wednesday, December 8		
8:30-8:45	Workshop Announcements	Melissa Bimbi and Walker Golder
	Session 3: Habitat Use and Conservation	
8:45-9:05	Partitioning The Annual Survival Of Great Lakes Piping Plovers	Erin Roche
9:10-9:30	Turnover Rates and Population Size of Piping Plovers in South Carolina	Jonathan Cohen
9:35-9:55	Breeding Origin Of Piping Plovers Wintering In The Bahamas	Sidney Maddock
9:55-10:10	***Break***	
10:15-10:35	Assessing Diet and Habitat Quality for Overwintering Piping Plover Populations in SC	Derk Bergquist
10:40-11:00	Winter Ecology Of Piping Plovers At Oregon Inlet, North Carolina	Jonathan Cohen
11:05-11:20	Migratory And Wintering Abundance And Distribution Of Piping Plovers in Texas	Margo Zdravkovic
11:25-11:45	Building and Maintaining Cooperator Networks for Piping Plover Conservation	Scott Melvin
11:50-12:10	Three Decades Of Observing Wintering Piping Plovers In South Texas	Tony Amos
12:15-1:30	***Lunch***	***On your own***
1:30-1:50	Session 3 CCS Talking Points	Karen Terwilliger
1:55-2:25	2011 International Piping Plover Winter Census	Elise Elliott-Smith
2:30-3:00	Band Identification Skills For Non-breeding Piping Plovers	Sidney Maddock
3:00-3:15	***Break***	
	Session 4: Recreational Disturbance	
3:15-3:35	Managing For Public Access And Listed Species In The Coastal Zone	Olivia LeDee
3:40-4:00	Migratory and Wintering Shorebird Monitoring and Management at CHNS	Mike Byrne
4:00-4:15	Session 4 CCS Talking Points	Karen Terwilliger
	Session 5: Outreach and Education	
4:20-4:40	The Florida Shorebird Alliance: Florida's Shorebird Partnership Network	Nancy Douglass
4:45-5:05	South Carolina Shorebird Project	Melissa Bimbi, Sidney Maddock, Walker Golder, and Felicia Sanders
5:05-5:20	Session 5 CCS Talking Points	Karen Terwilliger

5:20-5:30	**Workshop Wrap-up**	Melissa Bimbi and Walker Golder
Thursday, December 9		
8:00-2:00	**Piping Plover Winter Habitat Field Trip**	Lt. Talbot Island State Park

ABSTRACTS

2009 RANGEWIDE PIPING PLOVER STATUS REVIEW – POPULATION STATUS

Anne Hecht[1], Jack Dingledine[2], and Carol Aron[3]

[1]U.S. Fish and Wildlife Service, Northeast Region
[2]U.S. Fish and Wildlife Service, East Lansing Field Office, Michigan
[3]U.S. Fish and Wildlife Service, North Dakota Field Office

Section 4(c)(2)(B) of the Endangered Species Act requires the U.S. Fish and Wildlife Service (USFWS) to review the status of each listed species at least once every five years to determine if it should be removed from the list or reclassified. In September 2008, the USFWS published a request for new information regarding the status of the piping plover. In September 2010, we finalized a detailed summary and review of the best available information, and recommended retaining the piping plover's current classification, i.e., endangered in the watershed of the Great Lakes and threatened in the remainder of its range. At a population of 63 breeding pairs in 2008, the Great Lakes piping plover has attained approximately 40% of the 150 breeding-pair recovery goal. Although there has been progress toward many of the recovery goals established for the population, Great Lakes piping plovers are in danger of extinction due to their low abundance, limited distribution, and persistent threats from habitat degradation, human disturbance, and predation. Recent disease outbreaks and an increase in raptor predation highlight the population's precarious status. Long-term agreements and funding are needed to maintain the annual management activities aimed at reducing human disturbance and predation threats.

The Northern Great Plains piping plover estimated population size has increased since 2001, but it remains below the recovery goals set out in the 1988 recovery plan. Furthermore, the factors that led to the species' listing (i.e., habitat loss and degradation due to water management on the river systems, predation, and human disturbance), as well as other activities (e.g., growing oil and gas production) continue to threaten piping plovers on the Northern Great Plains. The Atlantic Coast piping plover remains vulnerable as a result of low abundance in the Eastern Canada and Southern (and, to a lesser extent, the New York-New Jersey) recovery units. All of the factors that led to the piping plover's 1986 listing remain operative on the Atlantic Coast, and many of these threats have increased. Reliable funding and long-term agreements are needed to assure conservation of habitat and continuation of the intensive annual management activities to reduce human disturbance and predation. In addition to the considerations pertinent to each breeding population, all piping plovers remain at risk due to continuing habitat loss and increasing human disturbance during the two-thirds of their annual cycle spent in the migration and wintering range. Immediate efforts are needed to reduce threats from sea-level rise throughout the species' coastal range. Actions may also be required to provide protection against other effects of climate change and from potential rangewide threats posed by wind turbine generators. The Status Review also presented recommendations for future piping plover recovery actions. Prominent recommendations included accelerated implementation of recovery actions in the piping plover's coastal

migration and wintering range, and revision of the recovery plan for the Northern Great Plains breeding population.

INTERNATIONAL COOPERATION FOR SHOREBIRD CONSERVATION

Brad A. Andres

National Coordinator, U. S. Shorebird Conservation Plan, U. S. Fish and Wildlife Service, Division of Migratory Bird Management, Denver, CO

Shorebirds are one of the most migratory groups of animals on the planet. Of 51 species that breed in northern North America, substantial portions of the populations of 40 species (78%) spend the boreal winter in Latin American and Caribbean countries. Shorebirds breeding in northern North America can also be found wintering in eastern Asia, Australia, Polynesia, and northern Europe. In their wintering grounds, migrant shorebirds share habitats with numerous resident bird species and austral migrants. Clearly, an understanding of the relationships between shorebirds and their environments throughout their annual cycle is needed to develop effective conservation actions. The shorebird community has a solid foundation of using a hemispheric approach to conservation issues. Recognizing the hemispheric connections of shorebirds, biologists established the Western Hemisphere Shorebird Reserve Network in 1986. Since that time, numerous organizations and funding entities have embraced an approach to shorebird conservation that addresses their annual cycle, examples include: the Neotropical Migratory Bird Conservation Act, Packard Foundation, National Fish and Wildlife Foundation, USDA Forest Service's International Programs, and the Western Hemisphere Shorebird Group. Despite these efforts, gaps in knowledge, capacity, communications, and management activities and the social context hamper our ability to develop an effective, hemispheric approach to shorebird conservation — local policy makers are unaware of conservation issues, little land area is highly protected, the skilled professional pool is inadequate, conservation resources are limited, and living conditions are barely tolerable. Further collaboration and cooperation would greatly enhance overall shorebird conservation efforts. This past summer, the Society for the Conservation and Study of Caribbean Birds (SCSCB) launched the Caribbean Waterbird Census (CWC), which is intended to link to the Neotropical Waterbird Census. An inaugural workshop was held to provide training in implementing the CWC, (including how to design and implement surveys, levels of monitoring and CWC protocols), waterbird identification, count training tools and habitat monitoring, field sessions to practice survey methods, data entry and analysis, and presenting results to decision-makers. Participants were also guided in the development of projects and preparation of proposals to implement monitoring on their islands. The SCSCB subsequently applied for funding for a small-grant program to support these applications and is now able to distribute funds for up to ten projects. There is an opportunity for North Americans to contribute to this effort.

EFFECTS OF A RECENT OIL SPILL ON LOUISIANA COASTAL BIRDS: THE BALANCING ACT BETWEEN COLONY DISTURBANCE AND THE CAPTURE OF OIL-IMPACTED BIRDS

Michael A. Seymour and Michael R. Carloss

Louisiana Department of Wildlife and Fisheries, Coastal and Nongame Resources Division, Baton Rouge, LA

Louisiana's coastal zone is home to >25 species of breeding, colonial nesting waterbirds, several of which are species of conservation concern. The state's critical barrier and coastal islands support >30% of the US population of a few species. Therefore, the responsibility to protect our nation's vital breeding and feeding grounds rests on Louisiana. In April 2010, a time when most birds were either actively nesting or initiating nesting activities, large quantities of leaked oil began reaching important nesting and loafing areas in southeastern Louisiana. The suite of birds apparently affected ranged from summering shorebirds to nesting or summering wading birds and seabirds. In addition to directing efforts to protect important bird areas, Louisiana Department of Wildlife and Fisheries also led the response effort to capture oil-impacted birds for rehabilitation. The response effort remained dynamic, shifting with the oil across the landscape and with modifications to best suit the different habitat types impacted. In some situations, oil-impacted birds were left in colonies to avoid excessive disturbance that could cause greater loss of individuals. Such big picture topics, including objective decision-making in a subjective- and emotionally-charged event, will be discussed.

ASSESSING THE IMPACT OF THE DEEP WATER HORIZON OIL SPILL ON PIPING PLOVERS

Daniel H. Catlin[1], Jonathan B. Cohen, Joy Felio[1], James D. Fraser[1], Sarah M. Karpanty[1], Sidney Maddock[1], and Cheri Gratto-Trevor[2]

[1] Department of Fisheries and Wildlife Sciences, Virginia Tech
[2] Canadian Wildlife Service

On April 20, 2010, the Deep Water Horizon drilling rig caught fire and exploded. The resultant oil spill lasted until the wellhead was capped on July 15, and the well was pronounced "dead" on September 19 2010, after mud and cement were pumped into the well. Some of the oil spilled during this incident washed up on beaches which could be habitat for the threatened piping plover. Here we report the design of a project to determine what, if any, effect the oil spill had on piping plovers. The project was funded by the Natural Resource Damage Assessment Program (NRDA). The spill portion of the study will be conducted on coastal beaches and barrier beaches from Raccoon Island, LA to Dauphin Island, AL. Reference data will be collected in Florida, Georgia and Texas. We expect all three sub populations (Atlantic Coast, Great Plains, and Great Lakes) to be represented in the sampling. Many piping plovers are marked from previous studies. We will mark additional birds to provide adequate sample sizes in the studied areas. Periodic surveys will be conducted and individually marked birds will be noted. We will estimate true and apparent survival, and immigration and emigration rates in the spill area and in control areas. Sightings of marked birds are solicited.

MUNICIPAL AND COMMUNITY-BASED BEACH MANAGEMENT PLANS FOR FEDERALLY AND STATE-LISTED SPECIES IN NEW JERSEY: POTENTIAL MODEL FOR PIPING PLOVER WINTERING SITES?

Todd Pover[1] and Stephanie Egger[2]

[1]Conserve Wildlife Foundation of New Jersey on behalf of New Jersey Division of Fish and Wildlife – Endangered and Nongame Species Program
[2]U.S. Fish and Wildlife Service – New Jersey Field Office

Through a partnership between the U.S. Fish and Wildlife Service-New Jersey Field Office (USFWS), the New Jersey Division of Fish and Wildlife-Endangered and Nongame Species Program, and the U.S. Army Corps of Engineers (Philadelphia and New York Districts) (USACE), coastal municipalities in New Jersey are being engaged in a process of developing and implementing beach management plans to protect federally and state-listed species, primarily piping plover (*Charadrius melodus*), least tern (*Sterna antillarum*), black skimmer (*Rynchops niger)*, and seabeach amaranth (*Amaranthus pumilus*). Under two Programmatic Biological Opinions between the USFWS and USACE, any municipality (or other land manager) participating in federal or state beach nourishment activities is required to develop a beach management plan. In addition, the New Jersey Department of Environmental Protection, the local sponsor of the nourishment projects in the state, is requiring the participants to complete a management plan to be eligible for state aid to help fund the project. Because of the significant cost of such projects, this serves as a strong incentive to complete the management plans. The management plans help meet one of the five Recovery Criteria in the USFWS Recovery Plan for the Atlantic Coast Population of Piping Plover – 4) *Institute long-term agreements to assure protection and management sufficient to maintain the population targets and average productivity in each recovery unit.* The management plans are comprehensive in nature, covering a variety of factors impacting reproductive success, including human disturbance, predators, and habitat quality and availability. Particular emphasis within the plans is placed on implementing actions and strategies that minimize the impacts of human disturbance. Among the major activities addressed are beach management and maintenance (i.e. mechanical beach raking, sand scraping, placement of dune fence), vehicle use (recreational and municipal), fireworks, pet use on beach, trash removal, and various recreational activities (i.e. surf kites, catamarans, personal watercraft, etc.). Requirements for biological monitoring, protocols for erection of fence and signage to protect nesting areas, and designation of species protection and transition zones are also addressed in the management plans. Although the management plans are focused on breeding populations and their associated issues, the factors addressed in the plans may have applicability for wintering and migratory populations of piping plover (and other coastal species). A few select management plans include conservation measures for the protection of migratory/wintering shorebirds and would be directly applicable. Furthermore, the mechanism of using Biological Opinions as a means to require the management plans may be a useful and efficient conservation tool for sites within the wintering range of piping plovers, especially if they are developed in a regional manner (i.e. programmatically rather than on a project by project basis).

SOUTH CAROLINA CASE STUDIES: INCORPORATING RECOVERY AND SECTION 7

Melissa Bimbi

U.S. Fish and Wildlife Service, South Carolina Field Office, Charleston, SC

In the past four years, South Carolina has had two shoreline stabilization projects permitted and one proposed within Piping plover (*Charadrius melodus*) designated critical habitat. The U.S. Fish and Wildlife Service's South Carolina Field Office (SCFO) has worked with the regulatory agencies and the project applicants to modify project designs and construction timing to minimize impacts to nonbreeding piping plovers and their habitat. The SCFO has also required pre and post project monitoring, which includes three components: (1) Piping plover surveys, (2) prey base sampling, and (3) habitat assessments, as a term and condition of each biological opinion to assess project impacts. Since the planning, permitting process, and monitoring last for many years, the SCFO is able to establish relationships with the parties involved. In recent years, these relationships have fostered collaboration and conservation efforts for Piping plovers as well as other shorebird species that migrate through, winter, or nest on beaches in South Carolina.

PARTITIONING THE ANNUAL SURVIVAL OF GREAT LAKES PIPING PLOVERS

Erin A. Roche[1], Todd W. Arnold[1], Olivia E. LeDee[2], and Francesca J. Cuthbert[1]

[1]Department of Fisheries, Wildlife and Conservation Biology, University of Minnesota, Saint Paul, MN
[2]Department of Forest and Wildlife Ecology, University of Wisconsin, Madison, WI

Despite the various fitness benefits that may result from migration, there is extensive evidence suggesting this is an energetically stressful time of heightened predation risk. Although temperature, precipitation and predation are known to influence migratory timing, there are few studies that have documented a similar effect on migratory survival, which should be the underlying factor governing migratory timing. The piping plover (*Charadrius melodus*) is a migratory shorebird species endemic to North America. There is a small and federally endangered breeding population in the US Great Lakes that has been the subject of a population-wide mark-recapture program since 1993, including observations on both the breeding and wintering grounds. This data set provides us with a unique opportunity to partition annual estimates of survival into four separate seasons: breeding, fall migration, winter and spring migration. This allowed us to estimate survival during both stationary and migratory periods and to assess the influence of various environmental covariates on seasonal survival. We generated estimates of weekly survival for Great Lakes piping plovers during 1999 – 2009 by season. The lowest weekly survival rates occurred during the spring and fall migratory seasons. Spring survival rates were positively associated with increasing mean minimum temperatures on primary wintering sites during the same period. Our study is the first to partition the annual survival of a single population of a migratory shorebird into its seasonal components. Our results demonstrate a 'cost of migration' in which weekly survival rates are higher during the stationary periods of summer and winter than they are during spring and fall. The strong association between local climate and survival during migratory intervals will inform us of some of the factors driving this endangered population.

TURNOVER RATES AND POPULATION SIZE OF PIPING PLOVERS IN SOUTH CAROLINA

Jonathan B. Cohen[1], Sidney Maddock[2], Melissa Bimbi[3]

[1]Dept. Fisheries and Wildlife Sciences, Virginia Tech, Blacksburg, VA
[2]North Carolina Audubon, Buxton, NC
[3]U.S. Fish and Wildlife Service, South Carolina Field Office, Charleston, SC

The extent to which migration and winter are a limiting period for piping plover populations have just begun to be addressed in the literature, and no links between survival and ecological factors in nonbreeding areas have been made quantitatively. To do so requires estimating demographic rates (i.e., survival, emigration, and immigration) and population size in a reliable way. We used resightings and flock counts of piping plovers in South Carolina in the winters of 2006/2007 and 2007/2008 to estimate immigration rate and apparent survival during migration and winter, and population size during winter, using mark-recapture models. The banded population included birds known to be after hatch year subadults, as well as some birds very likely to be hatch year birds from the Great Lakes. Immigration rates were highest in July and decreased through December when it was near zero for both age classes. During fall migration, immigration rates were higher for subadults than for adults. Apparent survival (including both survival and emigration) of subadults increased from July through December in both age classes until it was around 100%. Apparent survival of adults was higher than for subadults during fall migration. Thus, turnover rate of subadults was much more rapid than for adults throughout the fall, then became zero for both age classes in the winter. We estimated 69 [95% CI: 45 – 93] piping plovers in the winter of 2006/7 and 63 [95% CI: 38—87] piping plovers in the winter of 2007/8 in the core areas that we surveyed. Estimates and variances of turnover rate and population size collected over several years will provide important inputs for models of winter population dynamics and will allow for better-informed management decisions. For instance, adult piping plovers tended to stay in South Carolina even if they arrived early in Fall migration, indicating that habitat conditions in late summer and fall could affect the winter population size of piping plovers in the region.

WINTER ECOLOGY OF PIPING PLOVERS AT OREGON INLET, NORTH CAROLINA

Jonathan B. Cohen[1], Sarah M. Karpanty[1], Daniel H. Catlin[1], James D. Fraser[1], Richard A. Fischer[2]

[1]Department of Fisheries and Wildlife Sciences, Virginia Tech, Blacksburg, VA
[2]U.S. Army Engineer Research and Development Center, Environmental Laboratory, Vicksburg, MS

Humans may modify winter habitat of the imperiled Piping Plover (*Charadrius melodus*), yet published accounts of the species' winter ecology are rare. We studied Piping Plovers at Oregon Inlet, North Carolina from December 2005 to March 2006. Plovers used a 20.1 km^2 area (100% minimum convex polygon home range) containing narrow barrier islands with ocean and sound-side beaches, and small shoals, dredged-material islands, and marsh islands in shallow-water sounds. Plover activity was concentrated in twelve areas totaling 2.2 km^2 (95% fixed kernel home range). When plovers were on ocean beaches, they spent less time foraging (18%) than when on Sound Island beaches (88%) and islands (83%, $P = 0.003$). Sound island use increased and beach use decreased as the tide dropped (Logistic regression, $P < 0.001$). Plover use of dredged-material islands implied that habitat managers can create or restore attractive foraging sites where habitat may be declining or limiting. Wintering habitat management should aim to provide foraging opportunities during most of the day and across a range of tide conditions and ensure that foraging habitat is close to roost sites.

MIGRATORY AND WINTERING ABUNDANCE AND DISTRIBUTION OF PIPING PLOVERS AND OTHER IMPERILED SHOREBIRDS IN THE LOWER LAGUNA MADRE OF TEXAS

Margo Zdravkovic

Coastal Bird Conservation/Conservian

In 2009 Coastal Bird Conservation (CBC) conducted migratory and wintering surveys for Piping Plovers (*Charadrius melodus)*, and other priority shorebirds, in the lower Laguna Madre region of Texas. The key survey focal species included the federallylisted Piping Plover (*Charadrius melodus*) and Snowy Plover (*Charadrius alexandrines*). The lower Laguna Madre region has been identified as a major wintering area for Piping Plovers (Haig & Oring 1985, Haig & Plissner 1992, Eubanks 1994, Plissner & Haig 2000), however due to the vastness and remoteness of much of this region, systematic, comprehensive, repeated surveys have not been conducted throughout the nonbreeding season for Piping Plovers and Snowy Plovers in south Texas. Results from the 2006 International Piping Plover Winter Census report that only 48.2% of the Piping Plover breeding census total was detected on wintering grounds (Elliot-Smith et al. 2009). The CBC 2009 survey area spanned from the north side of the Mansfield Channel south to the mouth of the Rio Grande including the barrier islands, dredge spoil islands and mainland coastal areas. Surveys were conducted on federal, state, county and private lands and covered all areas designated as Critical Habitat for wintering Piping Plovers. Our objective was to thoroughly survey all known and potential nonbreeding shorebird habitat within the coverage area. Surveys were conducted primarily on foot, using ATVs and airboats to access survey areas. All Piping Plovers and Snowy Plovers were systematically counted and locations were GPS recorded. Habitat type, use and behavior were documented. Migratory surveys were conducted from September 4 through October 9, and wintering surveys from November 17 through December 14. During migratory surveys over 775 Piping Plovers were observed in the lower Laguna Madre, with more than 600 of these observed on South Padre Island alone. Similar numbers were observed during wintering surveys, with over 840 total individuals documented throughout the region, an increase from 459 in 2006, and 645 in 2001, observed during the International Piping Plover Censuses. Distribution of Piping Plovers changed markedly from the migratory to wintering survey period, with more individuals found on spoil islands and back beach flat areas of barrier islands, and fewer observed on the gulf beach. Survey numbers for Snowy Plovers documented during the winter surveys totaled 1,853 individuals for the lower Laguna Madre alone as compared to 1,340 total individuals documented state-wide in Texas during the 2006 International Piping Plover Census. CBC 2009 nonbreeding surveys of the lower Laguna Madre provide important new comprehensive region-wide data on population, distribution and habitat use for Piping Plovers and Snowy Plovers in the lower Laguna Madre Region and demonstrate the importance of thorough survey coverage. CBC survey data reinforces the high

importance of the region for key populations of nonbreeding plovers during these species migratory and wintering period of residency.

BUILDING AND MAINTAINING COOPERATOR NETWORKS FOR PIPING PLOVER CONSERVATION

Scott M. Melvin

Massachusetts Division of Fisheries and Wildlife

Multiple cooperators are necessary to effectively monitor, protect, and manage Piping Plovers and their habitats over large geographic areas throughout the annual cycle. Lessons learned from a review of the evolution and current status of Massachusetts' cooperator network may aid in the recruitment and effective use of cooperators to carry out monitoring and recovery work during non-breeding periods, especially on the wintering grounds. Massachusetts' network of Piping Plover cooperators has been a "work in progress" since 1984, when a smaller group of tern monitors and managers was encouraged by the Massachusetts Division of Fisheries and Wildlife (MassWildlife) to expand its efforts to include Piping Plovers. Currently, Massachusetts' cooperator network includes 4 federal agencies, 4 state agencies, 12 municipalities, $\geq$ 12 non-governmental conservation organizations (NGO's), Martha's Vineyard Land Bank, Waquoit Bay National Estuarine Research Reserve, Boston Harbor Island Coalition, several colleges and universities, and volunteers. The number and diversity of cooperators are strengths of the network, but also increase coordination needs. Statewide monitoring and management efforts are conducted annually for Piping Plovers, as well as for breeding terns and American Oystercatchers. Regulatory responsibilities and requirements pursuant to state and federal endangered species laws and Massachusetts' Wetlands Protection Act are primary factors stimulating involvement by many cooperators, especially agencies, municipalities, and private landowners. Others, particularly NGO's, have been motivated largely by their organizations' conservation or environmental education missions. MassWildlife coordinates the network, with additional coordination and technical assistance provided by U.S. Fish and Wildlife Service, through both the regional recovery coordinator and the New England Field Office. Work of cooperators is guided by the federal recovery plan for U.S. Atlantic Coast Piping Plovers, federal and state guidelines for managing off-road vehicles and other recreational activities on beaches where Piping Plovers and terns are present, a stewardship manual written by MassWildife, and other guidance documents related to monitoring and management. Coordination and communication with cooperators occurs via periodic consultations, either remotely or on-site, on issues dealing with monitoring or management. Interactions with many cooperators occur through state regulatory review and permitting processes. Cooperators receive annual directives about monitoring protocols, and annual reports that summarize statewide census data. The process of compiling and quality checking census data often results in additional communication. An end-of-season cooperators meeting held each year in August attracts $\geq$ 90-100 biologists, beach managers, seasonal monitors, law enforcement staff, and researchers, including attendees from adjacent states. This meeting provides MassWildlife, U.S. Fish and Wildlife Service, and cooperators with opportunities to interact formally and informally during a day-long meeting, review and discuss preliminary census results, hear

regional updates and presentations on management and research topics, and discuss current issues related to monitoring and recovery efforts. Cooperator networks take years to build, and require large commitments of time and effort to maintain. Coordinators need to think strategically about how to provide effective coordination and technical assistance, communicate priorities for monitoring and management, recruit new cooperators to fill gaps and build capacity, and maximize overall effectiveness of recovery efforts.

2011 INTERNATIONAL PIPING PLOVER WINTER CENSUS

Elise Elliott-Smith and Susan Haig

USGS Forest and Rangeland Ecosystem Science Center, Corvallis, OR

This winter we will be conducting the fifth International Census for Piping Plovers on their winter grounds. The International Piping Plover Census was first organized in 1991 to obtain a more complete understanding of the status and distribution of this federally threatened and endangered species. Since 1991, there have been subsequent Breeding and Winter census' every five years and we are currently preparing to implement the 2011 Winter Census. The 2011 Winter Census dates are 24 January – 6 February, and during this brief window we will implement surveys throughout the winter range of this species. As in 2006, we will also be surveying for Snowy and Wilson's Plovers. Since non-breeding Piping Plovers are so dispersed, the Winter Census provides information on species distribution and has been essential in identifying sites for recovery planning. Winter numbers are always much lower than the breeding season totals, likely due to inclement weather, incomplete coverage outside the U.S., and other challenges. Therefore, the Winter Census results are not a suitable abundance estimate for the species, but provide essential information on winter distribution and the relative importance of different winter sites and regions. Each Winter Census has had different challenges and goals. In 2006, we were challenged with surveying the Gulf Coast post-Katrina and the 2006 results reflected a shift in distribution due to hurricane Katrina. In 2011, one challenge will be surveying after a major oil spill and the Census will be one important gauge of the effect of the oil spill on wintering Piping Plovers. In 2006, an important goal was to greatly expand coverage in the Bahamas and Caribbean. Since high numbers of Piping Plovers were discovered in the Bahamas during the 2006 Census, one goal is to further increase coverage there in 2011.

MANAGING FOR PUBLIC ACCESS AND LISTED SPECIES IN THE COASTAL ZONE: THE CASE OF NONBREEDING PIPING PLOVERS (*CHARADRIUS MELODUS*)

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More than one third of U.S. federally listed species inhabit the coastal zone. This region, under increasing pressure from development activities, is also home to more than half of the U.S. population. The product is the contemporary tension between public access and ecosystem conservation. To understand how this conflict influences coastal management, we conducted a web survey of managers of 43 federal Critical Habitat units designated for protection of a threatened species, the Piping Plover (*Charadrius melodus*). We found that public access and ecosystem conservation are currently the primary goals of managers, 97 and 93% respectively, and to address both goals, numerous survey units incurred mission changes from sole-purpose initiatives (i.e. public access, ecosystem conservation) to a multiple-use mission (i.e. resource-based recreation). More than 1 million recreationists frequent some survey locations and studies indicate that unregulated public access negatively impacts nonbreeding plovers. Although managers cite activities that will be beneficial to management of the nonbreeding Piping Plover (e.g enforcement of leash laws), most survey locations (78%) have yet to address the conflict of interest between public access and ecosystem conservation. Low-cost, low-tech strategies that meet both goals exist and the tension will be exacerbated if neglected (i.e. inaction).

MIGRATORY AND WINTERING SHOREBIRD MONITORING AND MANAGEMENT AT CAPE HATTERAS NATIONAL SEASHORE

Michael Byrne[1], Britta Muiznieks[2], Meghan Carfioli, and Christina Wright

[1]National Park Service, Cumberland Island National Seashore
[2]National Park Service, Cape Hatteras National Seashore

Cape Hatteras National Seashore (CAHA) has been in the process of improving their management of shorebirds, and ORVs for several years. These efforts have culminated in the Draft Off-Road Vehicle Management Plan / EIS that is currently guiding management. Monitoring plays an integral role in evaluating management actions and, consequently, a migratory and wintering shorebird monitoring protocol was developed at CAHA to facilitate adaptive management and be compatible with existing Atlantic Coast shorebird-monitoring endeavors (i.e., International Shorebird Survey). This presentation will provide an overview of migratory and wintering piping plover management at the park, monitoring-design and inference, labor considerations, the near real-time feedback loop of the data management system, and how all of the aforementioned are in a constant state of improvement and refinement.

THE FLORIDA SHOREBIRD ALLIANCE: FLORIDA'S SHOREBIRD PARTNERSHIP NETWORK

Nancy Douglass, Chris Burney, Alex Kropp, Janell Brush

Florida Fish and Wildlife Conservation Commission

Florida is home to a diverse assemblage of shorebird and seabird species. Coastal habitats in Florida are now limited and highly fragmented as a result of extensive coastal development and beach modification. The quality of the remaining habitat is regularly affected by various threats associated with human activity (e.g. recreational activities, pets, predators, beach cleaning, beach nourishment projects). Consequently, shorebirds and seabirds that are sensitive to disturbance generally require intensive management to maintain viable populations at a local, regional, and state level. The pressure on Florida's coastal ecosystem's will continue to grow as the number of people living in coastal counties increases (predicted to double from 12.3 million to more than 26 million by 2060) and the impacts of climate change intensify (e.g. sea level rise, stronger weather events, disruption of weather and ocean patterns). Long-term population and habitat monitoring for shorebirds and seabirds will be necessary to track these changes and allow conservation planning and management to adjust appropriately. Given the scale and complexity of the issues associated with shorebird and seabird conservation in Florida, species protection and recovery is beyond the reach of any one agency or organization and requires collaborative work across organizational boundaries. Realizing this, the Florida Fish and Wildlife Conservation Commission (FWC) with funding from the State Wildlife Grants program, initiated a shorebird and seabird conservation project in 2007 which relies extensively upon partnership development and support. FWC staff members help to cultivate numerous local and regional partnerships to improve "on the ground" conservation through cooperative efforts between key agencies, organizations, and individuals involved with the management, monitoring, and stewardship of shorebirds and seabirds. In 2009, FWC launched the Florida Shorebird Alliance(FSA). This partnership network is being developed to facilitate information exchange between partnerships, improve coordination statewide, and add more consistency to monitoring and management.

Through the FSA, many new partnerships have developed around the state and existing ones have become better organized and equipped. As a result of improved coordination among a network of public-private partnerships statewide, shorebirds are receiving greater and more effective conservation attention and resource managers are getting better support and assistance from local conservationists. The program also seeks to address major data gaps for the highest priority species through establishment of monitoring protocols, development of a monitoring data repository, and by increasing data sharing. FSA partners have been instrumental in assisting with winter shorebird survey efforts including the Piping Plover Census. The FSA should serve as an invaluable tool for any Piping Plover conservation efforts within the state and represents an effective model for efforts in other states and regions.

THE SOUTH CAROLINA SHOREBIRD PROJECT

Melissa Bimbi[1], Sidney Maddock[2], Walker Golder[3], and Felicia Sanders[4]

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The South Carolina Shorebird Project is a group of County, State, Federal, Private, and NGO partners working together to achieve shorebird conservation in South Carolina through shorebird research, surveys, outreach, and education. The project was started in 2006 and initially focused on the Piping plover. During the 2006/2007 and 2007/2008 seasons, all Piping plover designated critical habitat units within South Carolina were surveyed once during fall migration, winter, and spring migration. In addition to those surveys, four sites were intensively monitored three times per month between July 15 and May 1. Band re-sightings were documented during each survey as well as the presence and number of Wilson's plovers, American oystercatchers, Red knots, and Marbled godwits. The survey results documented the following: (1) all Piping plover designated critical habitat units within South Carolina were occupied, (2) sites in addition to sites designated as critical habitat had Piping plovers, (3) detection of more Piping plovers than all previous International Winter Census efforts in South Carolina, (4) the importance of South Carolina for the Great Lakes population of Piping plovers (5) the importance of wrack for roosting Piping plovers, (6) overwintering Piping plovers arrive between July and September and depart between March and April based on uniquely banded individuals, (7) movements of uniquely banded Piping plovers between sites, (8) important sites for Wilson's plovers and Marbled godwits, and (9) potential recreational disturbance issues. In addition to the survey component of the project, education and outreach materials were designed and distributed to target audiences and Wilson's plover nesting habitat closures were introduced to island communities.

BIOGRAPHIES

Tony Amos is a Research Fellow at the University of Texas Marine Science Institute and the Director of Animal Rehabilitation Keep (ARK), which he founded in 1982. He is a physical oceanographer with an interest in the relationship between marine animals and the hydrography of the oceans and now the ecology of bird populations on barrier island beaches. He has made numerous observations of birds and marine mammals at sea, starting one of the first surveys of pelagic birds in the Antarctic ocean in 1966 and on Texas beaches during the massive IXTOC I oil spill in 1979/1980. He has studied piping plovers on a popular Texas barrier island beach since 1978 and an adjacent remote beach since 1995. He has made nearly 5,000 separate surveys and have counted over 140,000 piping plovers and has specialized in observing the banded plovers during two international banding experiments in the 1980s and again starting in 2002.

Brad Andres launched his professional career studying migrant shorebirds on the North Slope of Alaska for his Master's of Science degree and Black Oystercatchers in Prince William Sound for his Ph.D. After serving for 10 years as regional shorebird and landbird biologist in the U.S. Fish and Wildlife Service's Migratory Bird Program in Anchorage, he took a position with the Service in Washington D.C. as National Coordinator of the U.S. Shorebird Conservation Plan. He has held this position for 9 years and is currently living in the Denver, Colorado, area. His current position involves a mix of designing and implementing shorebird monitoring programs, providing administrative support for Shorebird Plan operations, and strengthening international components of shorebird conservation. His involvement in shorebird and wetland conservation has stretched from the High Canadian Arctic to southern Chile to western India. Beyond shorebirds, he participates on the review team for the Neotropical Migratory Bird Conservation Act, the science team of the State of the Birds effort, and the Monitoring Subcommittee of the North American Bird Conservation Initiative.

Carol Aron is the USFWS Northern Great Plains lead for the piping plover. She works in Bismarck, North Dakota. She did her undergraduate work at Mount Holyoke College in Massachusetts, and Master's at Indiana University. She grew up in Ireland, which is why she has a funny accent.

Derk Bergquist is manager of the Environmental Research Section at the Marine Resources Research Institute, a part of the South Carolina Department of Natural Resources. Dr. Bergquist earned his BS in Zoology at the University of Florida and his PhD in Ecology at The Pennsylvania State University. His current research involves applying basic ecological principles in order to better understand the impacts of human land use patterns and large-scale coastal modification projects on natural resources. His formal training is primarily in marine invertebrate ecology,

but over the past four years he has started applying this training to understanding piping plover foraging and the value of their overwintering habitat.

Melissa Bimbi is an endangered species biologist with the U.S. Fish and Wildlife Service. She primarily works on listed species in the coastal region of South Carolina and serves as the Atlantic Coast Nonbreeding Piping Plover Recovery Lead for the USFWS. She is also a member of the Sea Turtle Index Nesting Beaches Working Group. Her field work mostly involves loggerhead sea turtles and piping plovers, but she is involved in other waterbird projects. She has a B.S. in Wildlife Biology from Clemson University and a M.S. in Environmental Studies from the College of Charleston where she studied effects of egg relocation on loggerhead sea turtle nest success.

Andrew Boyne is Head of the Species at Risk Recovery Unit, with the Canadian Wildlife Service of Environment Canada responsible for delivering the species at risk program within the Atlantic Region, with an emphasis on recovery planning and implementation. He has worked for the CWS - Atlantic Region in the species at risk program since 1997 and has been head of the Unit since 2006. His work has focused on the recovery the Roseate Tern, Piping Plover and Harlequin Duck. Andrew has chaired the Canadian Roseate Tern Recovery Team and the Atlantic Canada Tern Working Group and is currently chair of the Eastern Canada Piping Plover Recovery Team. He was president of the Atlantic Society of Fish and Wildlife Biologists for four years and was past-president for another four. Andrew graduated from Mount Allison University in Sackville, NB, where he did his Honours thesis on small mammals. He received his Master of Science degree from McGill University in 1999, studying Herring Gull ecology in the Mingan Archipelago National Park Reserve. He is stationed in Dartmouth, Nova Scotia.

Mike Byrne is the Terrestrial Ecologist with the National Park Service's Southeast Coast Inventory and Monitoring Program and provides ecological and management support to managers at 17 National Parks in the southeastern U.S. He oversees the development and implementation of long-term community-level monitoring protocols for bird, amphibian, and plant communities. His education includes a B.S. in Psychology from Kennesaw State University, a B.S. in Wildlife Science from Oregon State University, a M.S. in Wildlife Ecology from Oregon State University, and a Certificate in Applied Statistics and Data Analysis from Colorado State University. The majority of his work and research over the years has focused on wildlife-habitat relationships, fire ecology, and reproductive ecology, and he has worked with a variety of avian, mammalian, and amphibian species. Prior to working for the NPS, he was a Botanist with the Nature Conservancy in Florida where he conducted long-term monitoring in support of a large wetland and upland restoration program.

Dan Catlin has a Bachelor's degree in Biology with a minor in Theatre (Hamilton College, N.Y.). He received his M.S. degree in Wildlife Sciences with a minor in Statistics from Oregon State

University, where he studied seasonal breeding dispersal of burrowing owls in California. He received his Ph.D. in Wildlife Sciences from Virginia Polytechnic Institute and State University, where he studied population dynamics of piping plovers on the Missouri River in South Dakota under the guidance of Jim Fraser. Dan has been involved in several piping plover studies addressing wintering and breeding grounds. He is currently a Senior Research Scientist in the Department of Fisheries and Wildlife Sciences at Virginia Tech. He is the director of field training operations for the Piping Plover Project in the Gulf.

Robyn Cobb has a BS in Animal Science from the University of Florida and a MS in Wildlife Science from Corpus Christi State University (now Texas A & M University- Corpus Christi). She has been with U.S. Fish and Wildlife Service since 1988 and is currently the Endangered Species Recovery Program lead for the Corpus Christi Ecological Services Field Office. She served as the Texas central coast coordinator for the 4 International Piping Plover Censuses conducted between 1991 and 2006. She is also the Service's Southwest Region's (Region 2) piping plover lead and the Texas' (and regional) representative on the Service's inter-regional piping plover team.

Johnathan Cohen earned his B.S. at Cornell University in Natural Resources in 1994, with a concentration in wildlife management. After graduation he worked as an interpretative naturalist at a nature center, and then a MAPS bird-banding intern, before earning his M.S. at the University of Connecticut from 1995 to 1998. His thesis focused on contaminant accumulation in wintering Greater Scaup in the northeast. His first work after receiving his degree was as a seasonal piping plover and least tern monitor for the Massachusetts Audubon Society. He was then hired as a biological technician at Patuxent Wildlife Research Center. There he assisted with development of a web-based database on contaminant accumulation in estuarine terrestrial wildlife as well as field and laboratory toxicology studies focusing on Osprey and Black-Crowned Night Herons . Between 2000 and 2005 he conducted his Ph.D. research at Virginia Tech on factors limiting piping plover nesting density and productivity on Long Island, New York. He remained at Virginia Tech until 2010, working on postdoctoral studies that included wintering ecology of Piping Plovers, migration stopover ecology of Red Knots, and lately an NRDA study of the effects of the Deepwater Horizon oil spill on Piping Plovers. He has consulted on projects including nonbreeding ecology of Piping Plovers in South Carolina, annual survival of Piping Plovers nesting in prairie Canada, disturbance to beach nesting birds on the Florida panhandle, and development of management protocols for threatened and endangered species at Cape Hatteras National Seashore. He will begin a new position in January 2011 as Assistant Professor of Wildlife at the State University of New York College of Environmental Science and Forestry.

Nancy J. Douglass received her B.S. in Wildlife and Fisheries Biology from the University of Vermont and her Masters of Environmental Management from Duke University. She has over

23 years of experience working in the wildlife profession, 20 of which have been with the Florida Fish and Wildlife Conservation Commission as a regional biologist. Her area of expertise is nongame wildlife but she is most recognized for her work in seabird and shorebird conservation.

Stephanie Egger is a Fish and Wildlife Biologist for the U.S. Fish and Wildlife Service's New Jersey Field Office Endangered Species Program. She is the lead biologist working with municipalities and other land managers on the development of beach management plans for the protection of federally and State-listed beach dependent species, including piping plover and seabeach amaranth. She is also responsible for carrying out Section 7 consultations with other Federal Agencies for project/permits that may impact piping plover and seabeach amaranth. Her endangered species planning efforts require extensive coordination with consultants, private organizations, interested stakeholders, State and Federal agencies, and the media.

Elise Elliott-Smith completed a B.A. at Pomona College and a M.S. at Southern Illinois University studying shorebird habitat relationships. She became interested in environmental studies and conservation while studying at the Maine Coast Semester and first studied birds in the Australian rainforest with the School for Field Studies. She has conducted songbird, raptor, and shorebird research with the Institute for Bird Populations, PRBO, Northwest Habitat Institute and the Oregon Natural Heritage Information Center. For the past eight years she has worked with Susan Haig, at the USGS Forest and Rangeland Ecosystem Science Center, on a variety of research and monitoring projects related to conservation of Piping Plovers, Snowy Plovers, Black Oystercatchers and Long-Billed Curlew. She coordinated the 2006 International Piping Plover Census and is coordinating the upcoming 2011 Census.

Jim Fraser has Bachelor's degrees in Marine Transportation (SUNY) and Fisheries and Wildlife Resources (University of Idaho). He received his M.S. and Ph.D. degrees in Wildlife from the University of Minnesota, where he studied bald eagle breeding ecology. Since joining the faculty at Virginia Tech in 1981, Jim and his students have conducted conservation-oriented research on a variety of threatened, endangered and sensitive species including bald eagles, black vultures, turkey vultures, Madagascar fish eagles, Nilgiris tahr, Southwest Willow flycatchers, loggerhead shrikes, crested caracaras, red knots and Wilson's plovers. The lab started work on piping plovers in 1986, and has worked on the Atlantic Coast and Great Plains breeding populations and on wintering birds from Texas to North Carolina.

Ben Gutierrez is a Geologist with the U. S. Geological Survey's Coastal and Marine Geology Program in Woods Hole, Massachusetts. His research focuses on coastal geology and coastal processes at time scales from seconds to thousands of years. This includes understanding the geologic uniqueness of different coastal settings, as well as nearshore ocean circulation and

sediment transport that influence modern-day coastal behavior. Over the past five years, Ben participated as a co-author of a U.S. Climate Change Science Program report on potential impacts of sea-level rise, and was the lead author of the chapter on ocean coasts. Currently, Ben is exploring a probabilistic approach to predicting sea-level rise impacts using Bayesian networks that can be used to integrate a variety of information about coastal settings and processes.

Walker Golder is Deputy State Director of the National Audubon Society's North Carolina State Office. He served as Audubon's manager of the Battery and Striking Island wildlife sanctuaries from 1986 to 1989, North Carolina Coastal Coordinator from 1989 to 1999, and Deputy State Director from 1999 to present. While he manages conservation programs throughout North Carolina, much of his work has focused on the conservation and management of shorebirds and waterbirds along North Carolina's coast and the southeastern United States.

Anne Hecht works for the Northeast Region of the U.S. Fish and Wildlife Service where she has been the Atlantic Coast piping plover recovery team leader since 1987. Over the last 23 years, she has been involved in implementation of almost every aspect of the Endangered Species Act for a wide variety of wildlife and plants.

Patty P. Kelly received her B.S. in Fisheries and Wildlife Science from North Carolina State University in 1990. She has worked for the U.S. Fish and Wildlife Service for 13 years as an endangered species biologist. She currently oversees the Candidate and Species at Risk Conservation Program for NW Florida. She coordinates Piping Plover Recovery and Section 7 (consultations) with field offices in Florida, Alabama, Mississippi, and Louisiana and handles recovery and consultation responsibilities in NW Florida. She was Region 4's lead for the 2001 piping plover critical habitat designation. She has spent the last 8 years working with the FL FWC and public lands managers to implement conservation actions to protect the Gulf Coast snowy plover. She has coordinated statewide and regional Census's for piping plover, snowy plover, and red knots. Prior to working for the Service, she was Vice President of J.H. Carter and Associates, Inc., an environmental consulting firm in North Carolina. Her entire career has involved endangered species protection efforts throughout the southeast including, birds, plants, fish, reptiles, amphibians, as well as wetlands delineation and restoration.

Olivia LeDee is an Assistant Scientist in Forest and Wildlife Ecology at the University of Wisconsin-Madison. She completed a M.S. and Ph.D. at the University of Minnesota, Twin Cities in Conservation Biology. Her research focus was the decline of North American shorebird populations in relation to coastal urbanization and natural resource management; she traveled to and worked with partners in Michigan, the Gulf of Mexico coast states, Cuba, and Mexico. Her current research topics include: modeling the response of terrestrial wildlife populations to climate change and associated disruptions; the interaction between land conversion and global

climate change to influence biological systems; decision-making in natural resource management for climate impacts. She works in collaboration with the Wisconsin Department of Natural Resources, the Wisconsin Initiative on Climate Change Impacts, U.S. Fish and Wildlife Service Upper Midwest and Great Lakes Landscape Conservation Cooperative, and other regional partners.

Sidney Maddock currently works for Virginia Polytechnic and State University as the Chief Resighter on the NRDA-Deepwater Horizon Spill Piping Plover Study. As part of that study, he will visit over 110 wintering sites on the Gulf of Mexico and Atlantic Coast to survey for piping plovers. He also trained the capture crew on use of the drop nets and whoosh nets to capture wintering piping plovers. In 2010, he worked for Dr. Cheri Gratto-Trevor in The Bahamas, where he and Peter Doherty captured and banded 57 piping plovers; this winter, he went back to resight the banded piping plovers that returned to The Bahamas. In three earlier winters, he did surveys for banded piping plovers on the Gulf of Mexico between Southwest Florida and South Texas for Environment Canada or the Canadian Wildlife Service. In 2006, he was the co-coordinator for the USGS Piping Plover Winter Census in The Bahamas, which established that country as a major wintering location for piping plovers. He previously worked for The National Audubon Society on the Outer Banks of North Carolina, where he managed the Ocracoke Inlet Islands Sanctuary and surveyed nesting shorebirds and colonial waterbirds there. While at Audubon, he did a two year study of non-breeding piping plovers in South Carolina.

Scott Melvin is the Senior Zoologist with the Natural Heritage and Endangered Species Program of the Massachusetts Division of Fisheries and Wildlife, where his responsibilities include coordinating monitoring and conservation efforts for Piping Plovers in that state. He is also a member of the graduate faculty in the Department of Natural Resources Conservation, University of Massachusetts-Amherst. He is a member of the Eastern Canada Piping Plover Recovery Team, and is a former member of the U.S. Atlantic Coast Piping Plover Recovery Team. He holds a Ph.D. in Wildlife Ecology and Zoology from the University of Wisconsin-Madison.

David Newstead received his MS in Marine Science from Texas A&M University-Corpus Christi. His graduate work focused primarily on larval fish ecology in response to freshwater inflows in the Nueces Estuary. During that time he participated in several bird-related projects and completed the first breeding census for Snowy Plovers in the central coast of Texas. After graduation, he went to work for the Coastal Bend Bays & Estuaries Program. There, he helped build on the habitat management efforts targeted for colonial nesting waterbirds, and has grown the program to include monitoring and research on shorebirds.

Todd Pover is the Beach Nesting Bird Project Manager for the Conserve Wildlife Foundation of New Jersey. In this capacity, Todd oversees management, monitoring, and research for piping

plovers, least terns, black skimmers, and American oystercatchers for New Jersey's Endangered and Nongame Species Program. He also serves as the state's coordinator for the federal recovery effort of the Atlantic Coast population of piping plover. He has been working with piping plovers since 1994.

Erin Roche is currently a post-doctoral research associate at the University of Minnesota and has worked on the conservation of Great Lakes Piping Plovers since 2005. She received a MS from the University of Minnesota in 2007 and her PhD in the spring of 2010. Her research has focused on the application of mark-recapture and other demographic techniques to answer questions pertaining to avian conservation and ecology. In 2011 she will begin a post-doctoral position at the University of Tulsa.

Felicia Sanders has been a Wildlife Biologist for South Carolina Department of Natural Resources for the past 10 years primarily working on seabirds and shorebirds. Additional duties include monitoring other coastal avian species such as Wood Storks, Bald Eagles, and Swallow-tailed Kites. She is an adjunct assistant professor at Clemson University and College of Charleston and has co-advised graduate students researching American Oystercatchers, Black Skimmers and Brown Pelicans. Her previous work experience includes avian monitoring in Longleaf Pine Ecosystem for U.S. Forest Service and Tall Timbers Research Station. She has a B.S. in Zoology from Duke University and a M.S. in Biology from Clemson University. Her graduate research focused on brood reduction in Red-cockaded Woodpeckers.

Michael Seymour was born and raised in Baton Rouge, La. Living in a state rich in birdlife and bird lore, he was hooked on birds at a very early age – counting migrant hawk kettles before his teen years, then moving on to general birding a few months later. As an undergraduate at Louisiana State University, where Michael earned a bachelor's degree in biology in 2001, he worked as a student intern for the LSU Museum of Natural Science, Section of Ornithology. He earned a Master of Science degree in entomology from LSU AgCenter in 2007, studying the effects of red imported fire ants on nesting bobwhite. He accepted a position at Louisiana Department of Wildlife and Fisheries in April 2007. Michael is currently the nongame ornithologist for LDWF's Louisiana Natural Heritage Program.

Karen Terwilliger received her B.S. in Wildlife Science from Purdue University and M.S. in Biology from Old Dominion U. She completed Natural Resource Leadership Training at U of VA's Institute of Environmental Negotiation where she is now an associate. She has worked on global issues with the International Association of Fish and Wildlife Agencies, and as a NATO fellow on Sustainable Management of Coastal Ecosystems. She's served on federal and state recovery teams and has a history of being an active leader in her professional societies and conservation efforts. Karen has worked with a diversity of municipal, state and federal government agencies as a natural resource manager and wildlife biologist. She managed VA's

Department of Game and Inland Fisheries' Nongame and Endangered Wildlife Program for 15 years before starting her own consulting company. Terwilliger Consulting, Inc. serves both private and public landowners, agencies and organizations as facilitator, planner, project manager and coordinator for a diversity of projects and processes targeting effective conservation communication and synergy. Among Karen's personal and professional goals is to reconnect people with nature and together to make positive changes as stewards of our precious natural resources.

Margo Zdravkovic 2008-Present: Director of Conservian, a non-profit organization dedicated to Earth conservation, and its Coastal Bird Conservation (CBC) program. (CBC) is a field-based, science-driven program dedicated to research, monitoring and protection of coastal birds and their habitats throughout the Western Hemisphere. The CBC's mission is to advance the conservation of our hemisphere's most threatened species of coastal birds throughout their breeding and non-breeding ranges. The CBC works with all interested partners to monitor, protect, stabilize and restore threatened beach-nesting, migratory and wintering coastal bird populations through standardized, proven methods of management and protection. CBC projects include multi-state, shorebird censuses, monitoring, research, management, and protection. Zdravkovic has led and conducted comprehensive regional and statewide surveys of breeding and nonbreeding shorebirds, on the Gulf of Mexico in Texas (2003-10), Mississippi and Louisiana (2005-10) Tamaulipas, Mexico (2006) Alabama and the Florida panhandle (2007-10) and the Florida Keys (2008-10). She is also currently authoring the "Wilson's Plover (Charadrius wilsonia) range-wide species conservation action plan for the U.S., Caribbean, Mexico, Central and South America" for the Manomet Center for Conservation Sciences and the Western Hemisphere Shorebird Reserve Network.

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