WESTERN HEMISPHERE SHOREBIRD RESERVE NETWORK

Conserving Shorebirds

An introduction to a site-based planning approach for practitioners

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WHSRN
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Through the AMBI project from 2015–2019, partners at eight sites were able to monitor shorebirds, take action on threats, engage communities in conservation, and learn from each other. That project brought together many elements of successful site conservation and has inspired the production of this guide. We wish to thank all the partners of this project that embraced collaboration and strengthened the WHSRN network: Moose Cree First Nation, Nature Canada, The Nature Conservancy of Canada, Bird Studies Canada, the Canadian Wildlife Service, One Hundred Miles, Manomet, Inc, Terra Peninsular, Conabio, Friends of Willapa Bay National Wildlife Refuge, Washington State Department of Fish and Wildlife, US Fish and Wildlife Service, and United States Forest Service. Each of these partners has their own network of partners with which they work at their sites—chambers of commerce, municipalities, businesses, state and local parks, Indigenous communities, schools, and nongovernmental organizations: it takes the commitment of all to achieve conservation.

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Foreword

The protection and management of key sites is one of the most important and effective tools for safeguarding biodiversity, protecting species from their greatest threat: habitat loss. For migratory species, such efforts need to extend across the network of key sites that maintain each species throughout its annual lifecycle. Conserving a coherent system of natural or semi-natural landscape elements can be a significant challenge. Fortunately, many shorebird species congregate in high densities at a small number of critical stopover and wintering sites. The effective protection and management of such key sites has been the foundation for the Western Hemisphere Shorebird Reserve Network (WHSRN) since its inception in the mid-1980s.

WHSRN is a grass-root, voluntary network of public and private partners which, at the time of writing, is working at 106 sites in 17 countries in the Americas, conserving more than 15 million hectares (38 million acres) of shorebird habitat throughout the Western Hemisphere. Designation of a WHSRN Site is just one step in efforts to better conserve and manage habitats for shorebirds. Communities at WHSRN sites often ask "What's next?" and "How can we connect with other sites in the network?" Whether your site has just been designated, or is looking to re-engage after a designation 30 years ago, this manual helps provide answers to support your stewardship.

While working with the Commission for Environmental Cooperation, through the Arctic Migratory Bird Initiative (AMBI)—Americas Flyway Action Plan project, the WHSRN Executive Office had the opportunity to explore the answers to these and other questions with both new and existing WHSRN sites. The project focused on eight sites, four of them long-standing WHSRN sites—Bay of Fundy, Delaware Bay, Grays Harbor, and Copper River Delta— and four new candidate sites for WHSRN designation—James Bay, Georgia Barrier Islands, Bahía Todos Santos, and Willapa Bay and Long Beach Peninsula. Six of these sites conducted site assessments to better understand their current status, threats, effectiveness of existing management, and actions needed. Through the site assessment process, sites chose to collectively focus on research and community engagement actions.

This manual builds upon the experiences of the individual sites, and shares resources, guidance, and opportunities for direct support. But perhaps more importantly, it shares examples of how the sites have benefited from working together to share successes and challenges, build capacity, and collaborate on solutions across their flyways. The existing WHSRN sites participated in the project primarily to build connections with other sites within their flyway. This is the 'network' part of WHSRN and one of the core reasons to join—the value of partner exchange is immeasurable.

The WHSRN Executive Office is here to offer support, provide resources, and foster connections as you embark on conservation planning at your site. We hope this manual will help you get started.

Contents

Introduction

Shorebirds are some of the most magnificent long-distance bird migrants. Timed with the availability of food resources, they travel thousands of miles each year between breeding grounds and non-breeding grounds. Shorebirds depend not only on healthy habitats on their breeding and non-breeding grounds, but also stopover sites along their migrations that encompass different countries and cultures. These sites are locally dynamic and are faced with many threats that have resulted in significant declines in shorebird populations.

The success of conservation efforts at a site scale level depends on the conservation efforts implemented in other places as well. The Western Hemisphere Shorebird Reserve Network (WHSRN) provides a collaborative framework for a network of critical sites to protect shorebirds and their habitats. WHSRN is a science-based, partnership-driven, conservation initiative for protecting the ecological integrity of critical habitats for shorebirds throughout the Americas.

What does this guide cover?

This guide has been developed to provide guidance, support, and resources for any individual or organization with interest in conserving a site and habitat for shorebirds. It provides a step-by-step guide for planning conservation at a site including collecting data on shorebirds, evaluating threats, agreeing on governance, managing habitat, engaging the community, valuing ecosystem services, and learning from other sites in the Network. The guide highlights the types of support available from the WHSRN Executive Office and Manomet Shorebird Recovery Program to help site partners achieve successful shorebird conservation. It includes practical examples from work completed through the Commission for Environmental Cooperation from 2015 to 2019.

How to use this guide?

If you are getting started at conserving a site for shorebirds and their habitats, then you may wish to read this guide section by section as it takes you through the planning process step by step. However, each section can be used on its own so you can refer to the content at any point in your planning process, and adapt it depending on your site's needs.

This guide is designed to help you throughout your planning process as you work towards the recovery of shorebirds and their habitats. We hope that you will find it useful and that it will inspire you to continue your dedicated work. For further assistance, or to learn more about working with the WHSRN Executive Office, please contact us at whsrn@manomet.org.

1 Shorebird Monitoring

This section highlights the importance of collecting data, introduces monitoring programs in the Americas, and outlines the support that the WHSRN Executive Office can provide.

1.1 Why is it important to collect data on shorebirds?

Monitoring provides essential information to quantify a site's importance for shorebirds and helps guide long-term conservation efforts.

General goals of shorebird monitoring:

- *Evaluate the status of shorebirds* through a long-term monitoring program, which can increase understanding of species trends and population estimates.
- *Understand migratory timing* by conducting regular surveys at stopover sites, when shorebirds are easier to count, as this will reveal whether numbers, arrival times, or departure times are changing from one year to the next.
- I*mprove habitat conservation* with information on changes in shorebird use at a site, which can indicate the health of an ecosystem, and set management priorities.
- *Identify priority sites* to designate a place as a WHSRN site or give other important recognition that can bring international conservation action to the site.
- *Engage the community* to build a constituency of supporters that will participate in management activities or monitoring of the site.

Monitoring programs can also focus on specific species or groups of species and collect data on breeding biology, foraging behavior, other behavior, and other topics of interest.

WHAT NUMBERS ARE KEY FOR DESIGNATING A WHSRN SITE?

WHSRN sites are designated based on monitoring data. When a site becomes part of WHSRN, it has been identified as being key for shorebird conservation based on a significant presence of shorebirds.

Criteria to become a WHSRN site include:

- At least 20,000 individuals per year, or
- At least 1% of the biogeographic population of a species.

Further details about WHSRN Site Categories can be found here.

Once baseline shorebird numbers are collected, a determination can be made of whether a site is eligible to join WHSRN. A list of shorebird population estimates and thresholds can be found here.

1.2 What are the monitoring programs in the Americas?

» In the Western Hemisphere, there are several monitoring projects and programs that contribute to shorebird conservation planning. We have highlighted below several of the monitoring efforts in the Americas. These programs collaborate, as they cover different regions, species, and times of the year. One of the oldest monitoring programs with a specific focus on shorebirds in the Americas is the International Shorebird Survey (ISS), which has been extensively used by WHSRN to document major shorebird migration staging areas and to identify and process site nominations (See Box 1).

» Migratory Shorebird Project (MSP)

» Atlantic Canada Shorebird Survey (ACSS)

» Ontario Shorebird Survey (OSS)

» Integrated Waterbird Management and Monitoring (IWMM)

» Neotropical Waterbird Census (NWC)

» Central American Waterbird Census (CAWC)

» Caribbean Waterbird Census (CWC)

» Southern Cone Grassland Shorebird Survey

» Arctic Program for Regional and International Shorebird Monitoring (Arctic PRISM)

BOX 1. WHAT IS THE INTERNATIONAL SHOREBIRD SURVEY (ISS)?

The International Shorebird Survey (ISS) is a citizen science effort of volunteers conducting field surveys during spring and fall migrations to provide hemispheric data on shorebird stopover sites. It was founded in 1974 by Manomet. The data gathered have been the bedrock for shorebird conservation planning in the United States. To date, volunteers have completed 80,000 survey counts at 1,200 locations in the Americas.

Under this protocol, the preferred monitoring option is to count shorebirds at ten day intervals throughout the survey periods (March-May and September-November). The ISS volunteer guide can be found here.

The results are shared widely through the ISS visualization tool online.

1.3 What support can we provide?

The WHSRN Executive Office can guide you through all the steps to establish a shorebird monitoring program at your site. We can help you:

Step 1 Outline the objectives. What data do you want to collect (e.g., specific habitat, species, season)? What is the purpose (e.g., raise awareness, protection, site designation)?

Step 2 Choose a monitoring protocol. Where is the site located? What is your time availability? Which protocol fits your objectives?

Step 3 Conduct on-site or remote training. Shorebird identification training can be provided through on-site workshops or as part of other events. You can also reach out to solve identification questions on shorebird observations.

Step 4 Analyze the data and share results. Our collaborators (e.g., Environment Canada) have in-house capacity to statistically analyze data, or we can also help you to interpret the data. For ISS, we share the results at the end of each monitoring season (See also Box 1).

2 Site Assessment

This section explains the Site Assessment Tool, its components, and how it can be deployed.

2.1 What is the Site Assessment Tool?

Understanding the current conservation condition at your site is one of the most essential parts of the planning process. The Site Assessment Tool (SAT) enables WHSRN sites to review their existing shorebird and habitat status, current and potential threats, effectiveness of current site management, priority actions, and next steps.

The site assessment tool helps to:

- Review the state of shorebird conservation at WHSRN sites.
- Identify and prioritize the threats at the sites.
- Assess the effectiveness of current site management and conservation efforts.
- Help sites engage in adaptive management by identifying priorities for action, information gaps, and monitoring needs.
- Provide information for education, awareness, management, fundraising, and advocacy.
- Provide standardized information for a network-wide analysis of the status of sites, for use in priority setting and conservation action planning.
- Engage stakeholders in a participatory process for long-term planning at the site.

BOX 2. STAKEHOLDER ANALYSIS AT WHSRN SITES

Stakeholder groups are rarely homogeneous, and there are usually important differences that affect the ways in which different groups perceive, value and use a site. Some of the differences to consider are:

- **Social difference (religion, caste, ethnic group, language)**
- **Gender (male/female)**
- **Age (young/old)**
- **Land ownership (owners/tenants/landless)**
- **Household size and availability of labor**
- **Household wealth and asset ownership**
- **Occupational status (e.g. primarily agricultural or diversified)**
- **Migration status (permanent residents, temporary residents and/or transhumant/ nomadic groups)**
- **Household level of education**

We recognize that although shorebird conservation is a priority for sites in WHSRN, it is not the only objective for the lands included at your site. For that reason, the Site Assessment Tool goes beyond evaluating shorebirds at the site and addresses other topics relevant to protected areas.

2.2 What are the components of the SAT?

The main components discussed during the site assessment include:

- *Management effectiveness:* measures elements of site management, resources, relationships with community and other stakeholders, and changes since designation;
- *State of the site:* evaluates the site's ecological integrity, using conservation targets and examining key ecological attributes.
- *Threats at the site:* discusses current and potential threats and how likely they are to affect the ecological integrity of the site in general. Gives special consideration to possible impacts on shorebirds, especially when more than 1% of a species' regional or global population is present at the site.
- *Conservation action:* assesses conservation measures currently in place and determines what priority efforts are needed.

2.3 Who are the stakeholders?

The assessments are built on the principle that site management is participatory and should involve stakeholders interested in the conservation of the site, including scientists, land managers and owners, local leaders, and community members. The end goal is to build consensus based on the results of the site assessment. A stakeholder analysis should be conducted as part of the preparations for the site assessment workshop (See Box 2).

2.4 What support can we provide?

The WHSRN Executive Office can facilitate the process of assessing the current situation of the site using the SAT. The assessment can be completed in two ways, depending on the needs of the site:

- **A 1-2 day workshop with all stakeholders and a facilitator from the WHSRN Executive Office.** This is a useful format if you do not have a wealth of information about your site's conservation history and current status. With this format, all stakeholders will participate in responding to the questions. In these cases, the site assessment can also serve as a helpful inventory of collective knowledge about the site.

- **An independent initial review followed by a large stakeholder workshop facilitated by the WHSRN Executive Office.** Several local experts will conduct an information review and complete the site assessment independently. These assessments are compiled, and then the results discussed and expanded on with a larger group of stakeholders during a facilitated workshop. This is a useful format for sites that already have a large amount of information, when it is more effective for a small group of people to review the existing information first.

3 Good Governance

3.1 What can you achieve with good governance?

This section explains good governance, its components, and characteristics, and the support the WHSRN Executive Office can provide.

Good governance plays a crucial role in the successful conservation of shorebirds and their habitats. It provides a structured and collaborative process to the people managing a site by creating guidelines for decision-making, including who has access to information and who participates. By reaching agreements through consensus, norms and rules are established for decision-making, management actions, and effective conservation.

A good governance process can help determine the relationships between key stakeholders and how each is held accountable. Potential actors and stakeholders include municipalities, government ministries, communities, and local leaders, nongovernmental organizations, businesses, private landowners, administrators and managers of protected areas, and universities and research centers.

With good governance, site partners can:

- Establish multi-stakeholder management committees
- Create management plans developed through participatory processes
- Create local authority by-laws that regulate the use of an area
- Develop proposals for official protected area status
- Develop projects that integrate site conservation efforts with development

WHAT ARE THE PRIORITY PRINCIPLES OF GOOD GOVERNANCE?

At WHSRN, we implement governance based on these four basic principles:

- *Accountability*: Explanation of the actions and why they were applied
- *Transparency*: Information and actions are shared openly
- *Participation*: Diverse stakeholders are actively involved in decision-making and implementation
- *Social justice*: All participants are given air treatment, protection, and sanctions

3.2 Why create a national plan?

A national plan for shorebird conservation provides an actionable framework for identifying priority sites and reaching agreements on strategies and management responsibilities. This kind of planning is beneficial when, in a country or other political or territorial division, there are various sites of significance for shorebirds, and there is

a need to involve the government for active multilevel participation in conservation efforts. Some of the topics discussed are governance, site management, legislation and policies, and the involvement of communities in conservation and financing.

Planning at the national level helps to align the country with the conservation efforts undertaken throughout the shorebirds' flyways in the Americas. It also helps the government to comply with its responsibilities under international intergovernmental agreements such as the Convention on Biological Diversity (CBD), Convention on the Conservation of Migratory Species of Wild Animals (CMS), and the Convention on Wetlands, called Ramsar.

The WHSRN Executive Office has facilitated the design and implementation of national plans in Brazil and Ecuador. We are currently supporting participatory planning processes in Argentina and Peru.

3.3 What support can we provide?

The WHSRN Executive Office can provide strategic guidance to improve governance conditions at your site, and at the national level. Through on-site workshops and continued mentoring, you and your partners can build and strengthen your site's capacity for good governance.

Step 1 Describe the state of governance. A discussion guided by specific questions helps to understand the current context of a site's management.

Step 2 Reach agreements. We can facilitate an on-site workshop with a conceptual framework and applied tools that will identify stakeholders, possible agreements and strategies to achieve them.

Step 3 Mentoring. We can provide on-site and online support in the implementation process, with personalized remote assistance and/or visit you and participate in meetings with stakeholders.

This section explains what habitat management is, provides examples, techniques, and the tools available from Manomet to support these efforts.

4 Habitat Management

4.1 What is Habitat Management?

Habitat management is the sum of actions needed to reverse the negative influences on wildlife species and/or the conditions of the lands that support them. The purpose of applying management actions is to improve local ecological functions that are beneficial to shorebirds, leading to increased quality and quantity of available resources. Shorebirds respond well to improved conditions of their preferred coastal, freshwater, and upland habitat. We believe that implementing management actions at important locations throughout the full life-cycle of migratory shorebirds will improve the health of individual birds, leading to higher reproductive output and greater changes of survival, and eventually result in measurable population growth.

The conservation impacts of improved habitat management include:

- Increased number of acres including but not limited to grasslands, wetlands, and coastlines providing important, life-sustaining resources for shorebirds.
- Increased use of improved habitat by shorebirds, reflecting improved conditions.
- Improved capacity of local practitioners, including land managers, biologists, landowners, businesses and government agencies, to identify and take action to reduce threats to shorebirds.
- A more informed public as a result of information dissemination through teaching and outreach of workshop participants to their various constituencies.
- Improved connections with local and international networks working for the conservation of shorebirds.
- The development of a regional culture of understanding, appreciation, and a growing community of engaged conservation practitioners and citizens.

Through the Habitats for Shorebirds Project, Manomet's Habitat Management Division delivers immersive educational workshops focused on shorebird ecology, conservation needs, and habitat management strategies to improve habitat conditions. With a focus on priority areas throughout the Americas, we work with stakeholders to ensure long-term provisioning of habitat, improve food and roost-site availability, and reduce disturbance.

Learn more about the work of the Habitats for Shorebirds Project in this story map.

4.2 How to manage habitat?

"A couple department managers are thinking about adjusting their management to provide shorebird habitat and a couple more have initiated shorebird monitoring as a result of the symposium and a couple more may initiate monitoring as a result of the tour. All of these are major steps here in Kansas and most likely this is just the beginning as The Nature Conservancy's partnership with Manomet continues to grow."

ROBERT PENNER

Habitat management techniques should be customized to a specific site based on how, when, and where shorebirds use it and what the threats are. It is also critical to consider landowner objectives, landscape features, and population goals for the shorebirds of concern.

Some examples of techniques for increasing habitat quality and availability are rotational grazing of livestock, providing suitable water levels in managed wetlands, removing problematic and invasive plant species, establishing buffer zones to decrease human disturbance, and banning dogs from sensitive areas such as nesting sites.

The Habitat Management Division is creating a Shorebird Management Manual that will be available by the end of 2019. This manual will provide guidance for the implementation of habitat improvements and threat reduction to benefit shorebirds, and will include case studies of successful habitat management at sites throughout the Americas.

4.3 What support can the Habitat Management Division provide?

Wherever you are in the process of improving conditions for shorebirds at your site, the Habitat Management Division can work with you to achieve your target goals through:

Step 1 Delivery of a Habitat Management Workshop. A workshop is planned and delivered by combining local partners' knowledge and experience with Manomet's staff expertise via multiple learning strategies including in-classroom instruction, guided group discussions, and field-based practice. Lesson modules include shorebird identification, ecology, threats, conservation strategies, invertebrate food resource needs, estimating and monitoring of populations, among others.

Step 2 Identify strategies to improve habitat. Guided group discussions help focus in on widespread challenges to shorebird conservation through locally relevant examples. This process helps to identify opportunities for next steps and ways to overcome site-specific barriers to implementing shorebird conservation practices.

Step 3 Mentoring. After workshops end, Manomet's Habitat Management Division and the Habitats for Shorebirds Project team continues to mentor and collaborate with participants to facilitate conservation action.

If you have questions relating to habitat management or interest in hosting a habitat management workshop, please contact Monica Iglecia, miglecia@manomet.org or Brad Winn, bwinn@manomet.org.

5 Community Engagement

5.1 When and how should communities be engaged?

This section explains four strategies to engage the community in the conservation of shorebirds at your site, highlights how to use the community engagement toolkit, and features informative case studies.

The solutions to shorebird threats are rooted in collaborations with local communities. The site may only need one community engagement strategy for one audience. But most likely your community engagement program will combine several engagement strategies. Each type can reach different audiences and address different aspects of the threat you are focusing on. They may share messages, tools, or materials, building on each other. In this way, education can lead to stewardship and citizen science, which can lead to advocacy.

Four community engagement strategies:

- *Social marketing for behavioral change* is used when you identify a human behavior that is impacts shorebirds, and you influence the change by identifying barriers to change and providing a benefit to achieve the desired action.
- *Education to build a broader base of supporters* is used to increase awareness among the community about the site and the importance of shorebirds, and then to build the constituency of people acting that act for conservation of the site.
- *Volunteer programs for support of conservation actions* is used when you need to build a constituency of supporters and the site has management activities or monitoring with predictable timing and an easy-to-learn protocol. Volunteer-based stewardship and citizen science programs provide passionate people with an opportunity to take action and support restoration and monitoring projects.
- *Advocacy to engage in the decision-making process* is used when a management authority needs to hear from stakeholders on a policy decision. A supportive constituency will use its collective voice to advocate for the site's conservation efforts.

5.2 What support can we provide?

The WHSRN Executive Office has compiled recommendations and tools to help site partners select, design, implement, and evaluate the community engagement strategies that are the best fit for the threats at their site. These resources include case studies, sample surveys, and examples from published research.

The step-by-step process in this user-friendly toolkit is:

Step 1 Identify the threat, and the action needed. The SAT (Section 2) will help you to assess these.

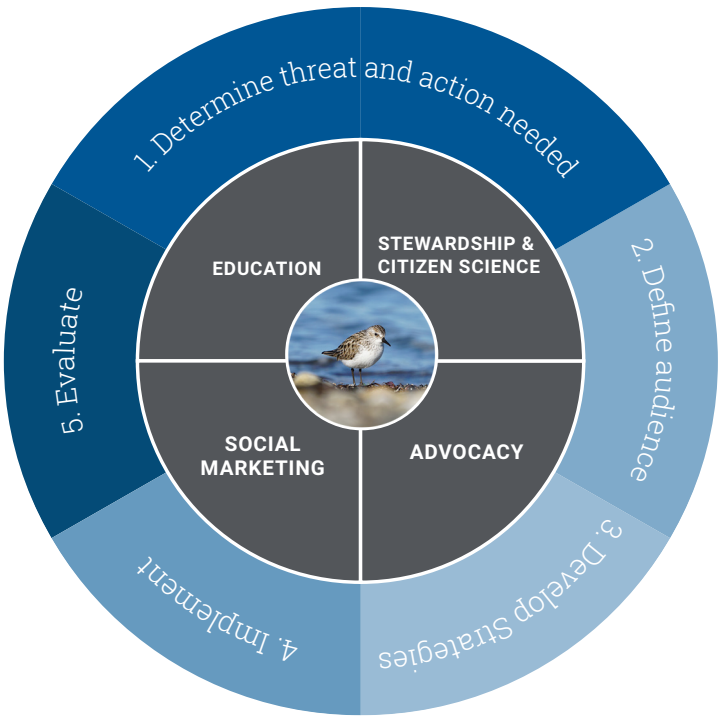
Step 2 Define the audience. Focus on the audiences that are necessary to resolve your threats or contribute to conservation actions.

Step 3 Develop strategies. For each audience you should have a clear plan that resolves the barriers and provides the mo¬tivators for change or action.

Step 4 Implement. Time is needed for social marketing or any community engagement campaign to be successful. Implementing partners should be prepared to work at the site over the long term, at least four years. In many cases, a community engagement program may need to be continuous, or the behavior might return.

Step 5 Evaluate. Think about the one or two most important things you want to evaluate. You can focus on one threat or behavior you wish to understand and how it changed. It is better to have a small data set over a long time, than a large data set that can't be sustained over time.

Figure 1. Components of a community engagement program.



5.3 Community Engagement Case Studies

BAY OF FUNDY, NEW BRUNSWICK, CANADA

Behavior Change

Threat: Human disturbance to roosting shorebirds during high tide.

Target species: Semipalmated Sandpiper

Audience: Beach users including anglers, dog walkers, joggers, and swimmers.

Objectives:

1. Increase understanding of recreational users, their activities, and perceptions of shorebirds at four important roosting areas.
2. Design a strategy to reduce disturbance through collaboration with recreational users.

Strategies and Implementation

» Patterns of human use at four Minas Basin's key shorebird roosting sites were evaluated with two methods. First, site audits were conducted to determine the numbers, types and extent of use by recreational users; numbers and extent of use by shorebirds; and frequency, cause and locations of shorebird disturbance incidents. Second, beach users were interviewed to understand their opinions, perceptions, and motivations at the beach.

- The types of users at each roost site varied, but the most common activities were sunbathing, swimming, walking, birding/photography, and fishing.
- The majority of disturbances in 2016-2018 were non-human disturbances. Human disturbances came from a variety of sources each year and at different beaches, indicating that a variety of messages will be needed, including those for swimmers, anglers, walkers, and photographers.
- Off-leash dogs are a common source of disturbance elsewhere, but at these four roosting sites, the incidents with dogs were low.
- The reasons why people selected a given beach varied. Certain beaches were popular for specific activities: fossil hunting, swimming, or fishing. This could impact how messages are presented at certain beaches.
- Conservation action was focused on two roosting sites, The Guzzle and Avonport Beach. Clear messages and signage were created so recreational users could avoid sensitive areas during high tide periods and participate in other safe practices for shorebirds, like keeping their dog leashed or packing out trash. These materials were displayed during peak migration (August). The slogan for the campaign is *Space to Roost*. Signs provide information on high tide periods, areas that are set aside for shorebirds, and areas that are best for recreation.
- One of the beaches that was selected was The Guzzle, a popular beach for anglers. In the first two seasons of deployment of *Space to Roost* messages and signs, the mean hourly number of human-induced disturbances was reduced by 79%. At Avonport Beach, the number of users in all three years was too small to determine a change from year-to-year.
- Many people at Evangeline Beach mentioned that the beach had been recommended to them by tourism operators. Collaboration with local tourism operators was explored to support this site's potential as a regional outreach hub, offering interpretative resources.
- In 2018, a *Space to Roost* sign was placed at the entrance to Blue Beach, targeting fossil hunters. This site was not monitored.

BIRDS CANADA OISEAUX CANADA

Space to Roost is a project of Birds Canada.

WILLAPA BAY AND LONG BEACH PENINSULA, WASHINGTON STATE, UNITED STATES

Education

Threat: Human disturbance of roosting and nesting shorebirds on Long Beach

Target Species: *roselaari* Red Knot, nesting Snowy Plover and other roosting migratory shorebirds.

Audience: Beach users including dog walkers, vehicles, people flying kites, and clam diggers

Objectives:

1. Build a constituency of people who have increased awareness and appreciation for shorebirds.

2. Increase the appreciation of shorebirds by visitors and, through education, help them understand how they can be respectful visitors, sharing the beach with shorebirds, and allowing shorebirds to feed and rest undisturbed.

Strategies and Implementation:

» Elementary and middle school students on Long Beach Peninsula created artwork that would then become signs to be displayed throughout Willapa Bay and Long Beach Peninsula. The 7th and 8th grade art teacher at Hilltop Middle School in Ilwaco, Washington, conducted a 5-week after school program with seven students who volunteered to participate and create artwork. Additional presentations were conducted and artwork created at Ocean Park Elementary by 77 third graders and 72 members of the Boys and Girls Club of Ilwaco.

- Twenty-six finalists were selected from 151 pieces. Thirty-five signs were installed at 22 different locations. Locations with high numbers of visitors were prioritized, as well as areas where shorebirds are likely to be present in large numbers, foraging or roosting in spring.
- Ocean Park Library and Ilwaco Timberland Library displayed a selection of artwork for two months. All pieces of art were also installed at the Pacific Columbia Heritage Museum for the dedication ceremony and were on display for a month.
- Each sign included a uniform 'footer' that provides a description of the shorebird story at Willapa Bay, tells how people can reduce disturbance, and shows what people can do to help shorebirds. The footer is the same for all signs.
- A stewards' program was created to educate and inspire beach visitors, to decrease the current level of disturbance from people, dogs, kites, and vehicles. In 2018, the program successfully recruited eight volunteers and participated in seven festivals or other events that had large numbers of people participating. Some of these festivals included the razor clam festival, truck rally, garlic festival, farmers' market, and international kite festival.
- People responded positively to the presence of the stewards, engaging with them at their booth and expressing interest in shorebirds. Messages focused on ways to avoid disturbing flocks and nesting areas, both in vehicles and on foot. People were taught that the reason dogs and kites are particularly harmful is that they can resemble predators—foxes or raptors. Finally, messages included the need for proper disposal of trash and picking up trash, because of the potential for predator attraction.

GEORGIA BARRIER ISLANDS, GEORGIA, UNITED STATES

Education and Behavior Change

Threat: Human disturbance of shorebirds roosting, feeding, and nesting.

Target species: *rufa* Red Knot, American Oystercatcher, Wilson's Plover, Whimbrel and other migratory species

Audience: Beach users, especially dog walkers

Objectives:

1. Build a constituency of people who have increased awareness and appreciation for shorebirds.
2. Increase beach users' appreciation of shorebirds through education. Messages include how to be a respectful visitor by sharing the beach with shorebirds and allowing shorebirds to feed and rest undisturbed.

Strategies and Implementation:

» Coordinated a training program for the City of Tybee Island's Beach Ambassador program. This program employs seasonal workers from Memorial Day to Labor Day to intercept beach visitors at key access points to answer questions about amenities, and to explain the beach rules to visitors.

» The training included a short beach walk (where issues such as disturbance, heavy recreational use by people, and wildlife feeding were discussed), a presentation, and the distribution of shorebird flipbooks.

» The presentation provided background information for the flipbook, which included information and photographs of shorebirds, along with the impact of human and dog disturbance. The flipbooks are a tool that the ambassadors can use when working on the beach to assist with compliance and acceptance of the 'no dogs on beach' ordinance.

This section explains what ecosystem services are, when and how you can evaluate them, and the support that we can provide.

6 Ecosystem Services

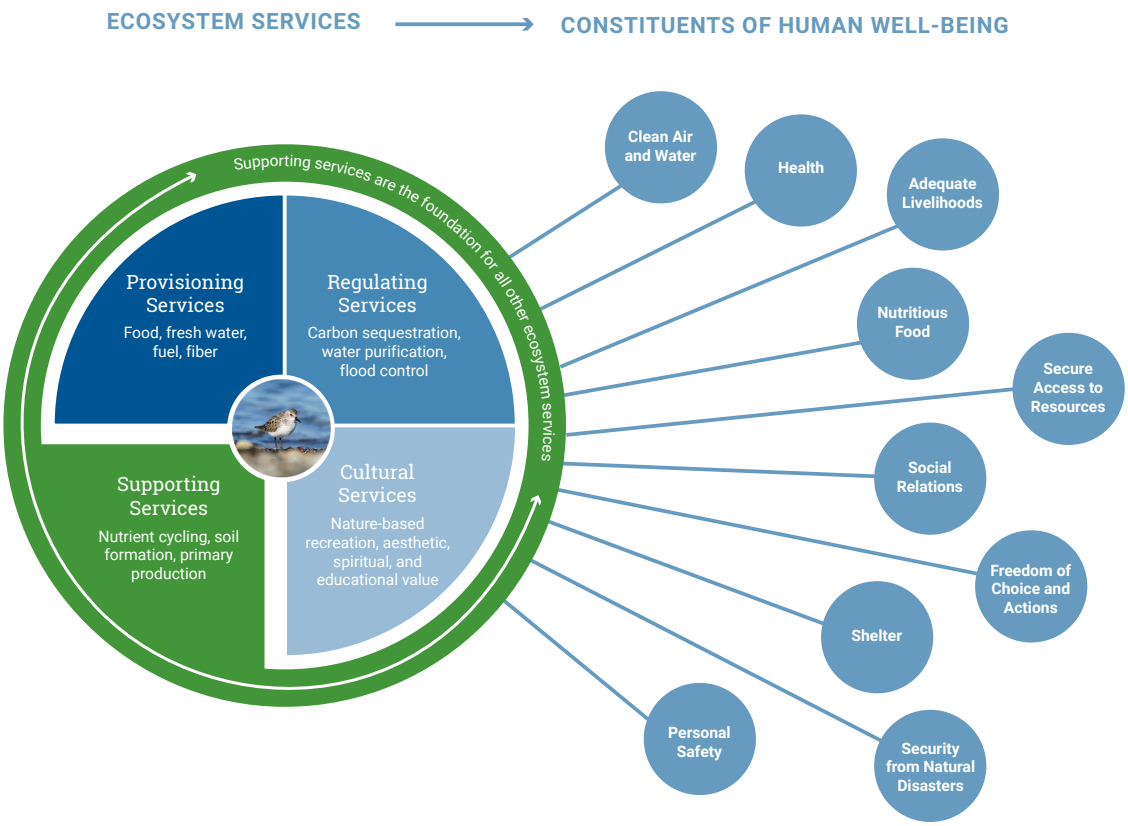
6.1 What are ecosystem services?

Ecosystem services are the goods and benefits that the natural environment provides people, and are essential constituents of human health and well-being.

Ecosystem services are classified into four categories:

- *Supporting services* underpin all other services by providing habitat for species, production of biomass and atmospheric oxygen, soil formation and retention, and nutrient and water cycling, among others.
- *Provisioning services* are the production of material goods such as nutritious food, clean water, sources of energy, and medicines that we obtain directly from the natural world.
- *Regulating services* maintain environmental conditions favorable to life like the quality of air and soil or by providing flood and disease control.
- *Cultural services* are nonmaterial benefits that provide us opportunities for spiritual enrichment, cognitive development, nature-based recreation, and aesthetic values.

Figure 2. Ecosystems support human well-being by providing supporting, provisioning, regulatory and cultural services.



6.2 Why assess ecosystem services at your site?

Integrating the needs of shorebirds with those of local communities can be critical to effective site conservation. You can assess ecosystem services at any point in your planning process. The results help to communicate the value of nature to decision makers, improve environmental planning generate information about benefits, identify stakeholders, increase awareness, and support conservation arguments For more information, see this discussion.

We approach the analysis from a perspective of conservation of shorebirds and WHSRN sites. The process is often driven by a proposed land-use change where it is unknown if it will affect the site positively or negatively. The assessment process is also applied when there is a need to influence a change in the behavior of people whose actions are affecting shorebird populations.

As most of the WHSRN sites have local communities that depend on the benefits the sites provide, we involve local communities in all phases of the ecosystem services assessment. This process requires some initial training for the communities on the concepts and methods, but it is not difficult to get users to describe how a change in the provision of ecosystem services will impact them. The training will also contribute to raising awareness of the benefits that the sites offer to local communities.

6.3 What support can we provide?

The WHSRN Executive Office can guide you through all the steps to assess ecosystem services at the site scale level. We will build your local capacity to lead future assessments. You can find a hypothetical example here.

Step 1 Define the scope of work. Outline the objectives and reasons for assessing the ecosystem services at the site. Identify the area, the stakeholders, and the audience who will receive the results, the resources, and the timeframe.

Step 2 Identify the direct users. Identify a preliminary list of goods and services for the site and associated beneficiaries and those responsible for managing them. Through an inclusive workshop, gather an understanding of the current status of ecosystem services at your site, and what could happen to them in the future under the proposed change in land use.

Step 3 Choose the methodology. Decide on the specific ecosystem services to measure, the methods, and the equipment and personnel needed. Collect data in the field and analyze the results.

Step 4 Share results. Prepare outreach materials to communicate results on your site's current and alternative feasible stated worth (monetary and non-monetary) to the audience defined in Step 1.

This section highlights the types of partnership exchanges available and featured examples from the Atlantic and Pacific flyways.

7 Linking Sites

7.1 Why are we connecting sites?

Many sites share the same species, values, goals, and challenges. With over 100 sites in the Network, a wealth of information and opportunities to learn from other partners are available. Exchanges between partners allow sites to learn from each other, collaborate on conservation action and research, and develop community connections through education.

What are the types of exchanges?

- *Ongoing:* A group of sites with shared values, birds, or goals develop strong relationships and maintain regular communication, sharing lessons learned, challenges, and ideas for action. These linked sites develop target projects for collaboration. Occasional in-person exchanges help to strengthen relationships and expand alliances and learning.

- *One-time, in-person:* One set of partners may visit a site to learn about particular actions at that site to improve specific skills and to generate inspiration for work at their own site. While there may be an immediate follow-up to share details of projects, long-term communication is [probably] not coordinated but the benefit will be achieved through capacity building.

- *Virtual:* It is not always realistic to have an in-person or ongoing exchange between sites. Opportunities to dialogue with partners exist through webinars, Shorebird Forum, emails, and regular calls.

What are the components of a successful exchange?

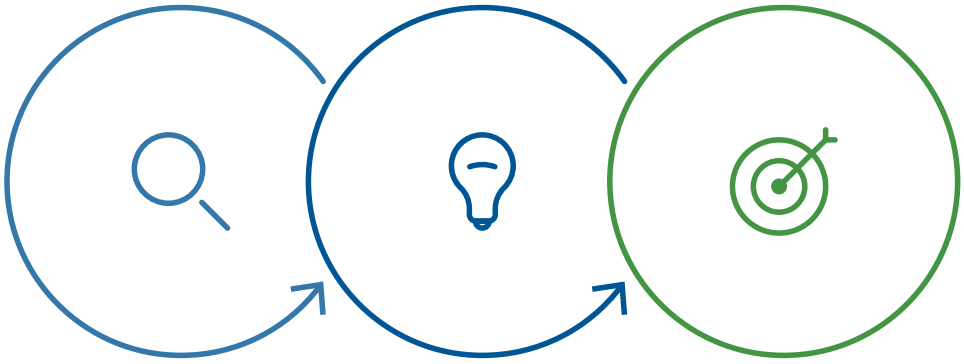
A fruitful exchange will have shared values and goals between sites to facilitate the discussion of information and ideas. The exchange should focus on relationships, not just shorebirds or wetlands. The exchange is for building capacity and inspiring new actions, but this can only happen through strong relationships that encourage collaboration and sharing. If the goal is to have a long-term, ongoing exchange, local champions who are motivated to foster these connections will be necessary at each site. Ideally, these local champions would be through an organization or agency to institutionalize the relationships. Topics could include research, festivals, conservation action, ecotourism, and education.

7.2 Case Studies for Exchange

To foster North American conservation opportunities for Semipalmated Sandpipers (Calidris pusilla) and Red Knots (Calidris canutus, rufa and roselaari subspecies), the Commission for Environmental Cooperation (CEC) has supported efforts to inform, engage and connect communities at key sites for these two species. This included linking partners at sites along the Pacific and Atlantic flyways.

PACIFIC FLYWAY EXCHANGE

Focus: Sustainable bird-based tourism



Partners from Willapa Bay and Grays Harbor travel to

Copper River Delta for Copper River Delta Shorebird Festival

Return to sites to implement Ideas

Exchange Goal: To facilitate the sharing of best practices and lessons learned from Cordova, Alaska regarding the development of sustainable bird-based tourism opportunities that promote shorebird conservation while generating economic benefits for the local economy.

Exchange Participants: *From Washington State, USA:* Cheri Lloyd, art teacher and active community member, Willapa Bay; Aaron Webster, Lewis & Clark Interpretative Center State Park, Willapa Bay; Christie Barchenger, Grays Harbor Historical Seaport Authority, Grays Harbor; Heather Kapust, Washington State Department of Ecology, Grays Harbor and Willapa Bay. *From northwestern Mexico:* Jorge Andrade and María Antonieta Valenzuela, Terra Peninsular.

Site Representatives: Erin Cooper and Jim Chu, US Forest Service (USFS); Cathy Renfeldt, Cordova Chamber of Commerce. Other site representatives included Mimi Briggs, festival organizer in previous years; Thea Thomas, local community member and bird guide during the festival; and Aaron Bowman, bird guide during the festival.

Highlights reported by participants:

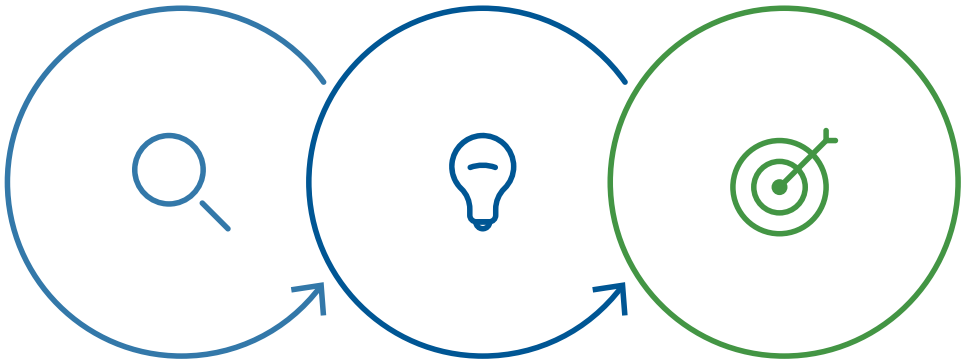
- Gained practical information on how to organize a festival, the types of activities to offer, and audience identification.
- Learned about opportunities to emphasize the economic benefit festivals can have for the community.
- Improved their shorebird identification skills and learned insights into research methodology.
- Inspired to develop tourism linked to birding on the Long Beach Peninsula.

Activities on return:

- *In Washington*—Formed a committee to create the first bird festival for Willapa Bay— Wings over Willapa. The festival was held in September 2018 and included several elements inspired by the Copper River Delta festival, such as having a combination of speakers, field trips, and vendors. Plans are underway for 2019. All participants also gave presentations to their respective colleagues and partners.
- *In northwestern Mexico*— Using the ideas and tools learned in Cordova to create a Manual of Bird Festivals, which will be used for developing the festivals in Ensenada and San Quintín in Baja California.

PACIFIC FLYWAY EXCHANGE

Focus: Research



Partners from Copper River Delta and Bahia Todos Santos travel to

Grays Harbor and Willapa Bay for roselaari Red Knot research

Return to site to plan for research

Exchange Goal: 1) To build the capacity of partners in Copper River Delta and Bahía Todos Santos through participation in shorebird research with Grays Harbor representatives. **2)** To build scientific collaborations along the Pacific Flyway.

Exchange Participants: *From Mexico:* Abril Copali Heredia Morales, Javier Eduardo Alcalá Santoyo. *From Alaska:* Brenda Guzman, Melissa Gabrielson

Site Representatives: Joe Buchanan, Washington Department of Fish and Wildlife; Vanessa Loverti, US Fish and Wildlife Service

Highlights from participants:

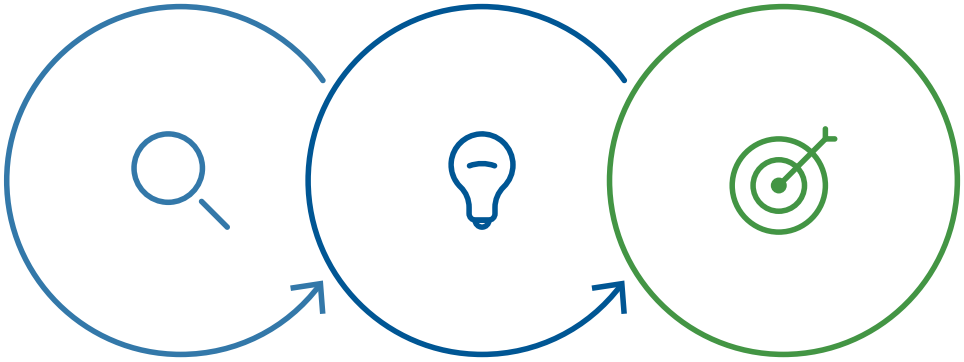
- Improved skills in handling Red Knots, conducting research with transmitters, and conducting shorebird monitoring.
- Increased understanding of the migratory connectivity along the Pacific Flyway.
- Developed valuable relationships with other shorebird conservationists in the Pacific Flyway.

Activities on return:

- Shared their experiences with local communities through blog posts and presentations.
- Collaborated with other participants on a paper about the status of the *roselaari* Red Knot.
- Maintained relationship with Joe Buchanan and other participants for improved communications across the flyway.
- Anticipate adding additional surveys in locations Red Knots are using, based on transmitter data.

ATLANTIC FLYWAY EXCHANGE

Focus: Festivals



Exchange Goal: To use the Delaware Bay experience to improve the Dorchester Shorebird Festival and other shorebird conservation activities.

Exchange Participants: *From Canada:* Mayor Bear and Councillor Feindel of the Village of Dorchester, New Brunswick; Kerry Lee Morris-Cormier and Denise Roy, The Nature Conservancy of Canada (NCC)

Site Representatives: Laura Chamberlin, WHSRN Executive Office; Lenore Tedesco, The Wetlands Institute; Elizabeth Shuster, The Nature Conservancy; Elizabeth Terenik, Middle Township, New Jersey; Lynne Pusey, Department of Natural Resources and Environmental Control, Delaware.

Highlights from participants:

- Strengthened relationship with Mayor Bear and Councilor Feindel of the Village of Dorchester, which has helped to integrate more shorebirds and shorebird education into the Dorchester Shorebird Festival.
- Visited the Peace, Love, and Horseshoe Crab Festival, an 'open house' at the Du-Pont Nature Center. With only a small budget and dynamic volunteers, the festival was an inspiring event with many activities and new ideas for the Dorchester Shorebird Festival.
- Explored the benefits of incorporating shorebird conservation messages into different cultural/tourist attractions that are not focused on shorebirds, for example, the Bayshore Centre at Bivalve.
- Learned from The Wetlands Institute that a successful shorebird festival is not dependent on a large budget, but rather on collaborative partners and good advertising, and that social media is the most effective way to advertise.

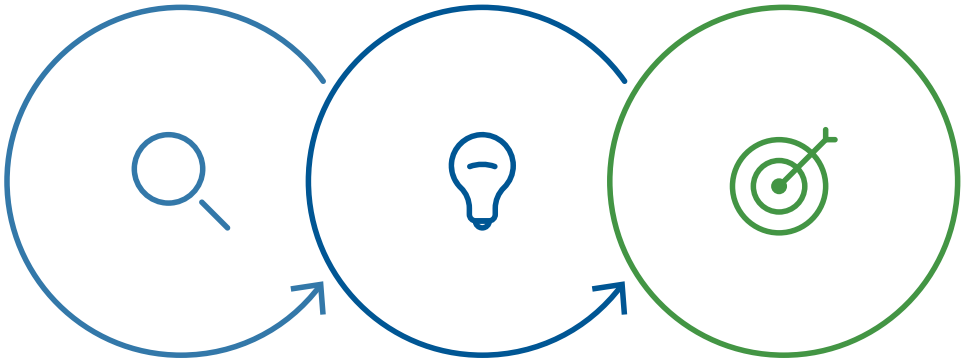
- Increased knowledge on communicating social and economic values of shorebird habitat conservation at all critical stops of their migration.
- Observed other community engagement activities in the region—such as beach closures, volunteer stewardship, live nature cameras and youth signs—which sparked additional ideas.

Activities on return:

- Conducted presentations for the Village of Dorchester mayor and Council, and the Chignecto Naturalists' Club.
- Circulated a press release to regional media and social media outlets.
- Collaborated with the Dorchester Consolidated School to initiate a youth sign project, involving students to create original educational artwork for display on the beaches.
- Incorporated a few additional shorebird related activities to the annual Dorchester Sandpiper Festival, making it more shorebird focused (e.g., interpreter-led bus tours to NCC's Interpretive Centre).
- Developed an eco-challenge passport event (similar to one at the DuPont Nature Center at NCC's interpretive center) during the Dorchester Sandpiper Festival.
- Discussed the possibilities of setting up a nature camera, with live video streaming from a camera set up on in a key roosting area, with a link to the national office of NCC.

ATLANTIC FLYWAY EXCHANGE

Focus: Managing Disturbance



Exchange Goal: To learn about the Space to Roost program of Bird Studies Canada and other effective conservation strategies that can improve communications with recreational users, advancing the goal of fostering long-term shorebird stewardship.

Exchange Participants: *From USA:* Laura Chamberlin, WHSRN Executive Office; Abby Sterling, Manomet; Audrey DeRose-Wilson, Delaware Department of Natural Resources and Environmental Control.

Site Representatives: Kerry Lee Morris-Cormier and Denise Roy, NCC; along with other partners including Bird Studies Canada, Canadian Wildlife Service, Hopewell Rocks Parks, Village of Dorchester.

Highlights from participants:

- Observed and discussed the Space to Roost Program of Bird Studies Canada.
- Participated in the Dorchester Sandpiper Festival and its youth engagement tools, including art activities, play, mascot, passport game, and an activity on MOTUS towers.
- Interacted with community, which highlighted how important each site is to the people at other sites, given the linkages between sites and importance of the actions of everyone in the network. Working with communities to steward this connection can help to validate conservation actions at a site.
- Discussed disturbance and management with researchers and managers at the different sites at the Bay of Fundy.
- Building relationships with other participants, learning about the challenges that they face and the similarities at our respective sites.

Activities on return:

Activities were focused in Georgia:

- Presented to the state ornithological group, a local Audubon group, and a group from the Cornell Lab of Ornithology. Presentations highlighted how these exchanges boost the ability of sites within WHSRN to communicate and collaborate, and provide a concrete example of the benefits of being part of WHSRN to site partners.
- Applied for funding to develop a project modeled on Space to Roost, with defined areas and time frames for restrictions, through community involvement.
- Prepared a symposium for the Western Hemisphere Shorebird Group meeting on disturbance and recruited Space to Roost creators to present.

If you are interested in connecting with another site through education, science, monitoring, or conservation please let us know at whsrn@manomet.org. We can connect you with other sites that are facing similar challenges, conducting similar activities, and sharing species along the flyway.

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