Improving the Practice of Stewardship: An Introduction to Evaluation

Kathleen Blanchard

Improving the Practice of Stewardship: An Introduction to Evaluation

A handbook for stewardship practitioners

2012

Written by Kathleen Blanchard

With contributions from:
Bird Studies Canada
Fundy North Fishermen's Association
Limestone Barrens Habitat Stewardship Program

Cover design and illustrations by Cynthia Colosimo

For information about Intervale or about this report, please contact:
Intervale Associates, P.O. Box 172, Doyles, NL A0N 1J0
Web: www.intervale.ca Email: kblanchard@intervale.ca

This project was undertaken with the financial support of the Government of Canada.

Photo credits: Long's braya, barrens willow and limestone barrens, ©Dulcie House; Piping Plover, ©Sidney Maddock. Right whale, ©Moira Brown, PEI beach, ©Kathleen Blanchard.

Acknowledgements

Several people contributed substantially to this project and I cannot thank them enough for their time and generosity. I extend my deepest appreciation to three experienced stewardship program managers in the Atlantic Region: Sue Abbott of Bird Studies Canada in Nova Scotia, Dulcie House of the Limestone Barrens Habitat Stewardship Program in Newfoundland and Labrador and Catherine Hood of the Fundy North Fishermen's Association in New Brunswick. This publication would not have been possible without their willingness to meet several times to share lessons learned from their many years of working in recovery of species at risk and to discuss approaches to evaluation.

Many researchers, policy advisors and funding program managers shared their extensive knowledge of stewardship and species recovery. Several of them also reviewed a draft of this handbook. I thank Al Hanson, Eden Thurston, Kevin Davidson, Sheri Faulkner Jackson, Tamara Gates-Hollingsworth, Karen Potter, Susan Glynn-Morris, Heather Gordon, Rick Wadman and Steve Ridlington of Environment Canada. My sincere appreciation also goes to Joan O'Brien of Fisheries and Oceans Canada and to Susan Squires, Jonathan Sharpe and Emily Herdman of the Newfoundland and Labrador Department of Environment and Conservation, Wildlife Division. Tania Schusler of Antioch University New England generously provided an overview of some leading evaluation tools, for which I am grateful. I thank additional researchers and stewardship practitioners who took time to discuss evaluation in the context of species recovery, namely Stephen Decker and Luise Hermanutz of Memorial University of Newfoundland; Rob Otto of the Province of Newfoundland and Labrador's Institute for Biodiversity, Ecosystem Science and Sustainability; Maria Recchia and Sheena Young of the Fundy North Fishermen's Association and Moira Brown of the Canadian Whale Institute. Over the years, several colleagues and friends have influenced my thinking about stewardship evaluation. I wish to thank in particular Gerry Yetman, Martha Monroe and David Nettleship.

I thank Gregor Beck, my colleague of many years, for his review and for his thoughtful insight into the practicalities of conservation work by nongovernmental organizations and volunteers. The illustrations by Labrador artist Cindy Colosimo beautifully convey positive relationship of people and species at risk. A project of this nature would be much more challenging were it not for Russell Wall of Intervale, who has provided steadfast technical support and document preparation throughout the project.

There are many excellent examples of stewardship programs in the Atlantic Region, which are managed by hard-working stewardship biologists and hundreds of dedicated volunteers. I regret that I could not visit all of the programs and include more descriptions of people's good work.

Funding for this work came from the Government of Canada Habitat Stewardship Program for Species at Risk, with additional support from Intervale and in-kind support from the Wildlife Division of the Newfoundland and Labrador Department of Environment and Conservation.

Table of Contents

List of Appendices

List of Tables

List of Figures

Preface

In 1981, the Vice President of one of Canada's largest conservation organizations challenged me in front of a large audience with the question, “Can you prove that education strategies really make a difference?” He was referring generally to strategies used in stewardship programs for the conservation and recovery of wildlife.

The gentleman knew from experience that most people in the audience--scientists, educators and university graduate students--were supportive of stewardship's goals and activities but likely would fall short of being able to provide measurable evidence of stewardship's impact on conservation and recovery. More than 30 years later, we find ourselves asking this same question. The difference is that stewardship's community of practice has made tangible progress in identifying the ingredients that make for effective programs.

If you are involved with a stewardship program, chances are you are already performing some of the tasks that are associated with program evaluation. You may be recording information about species and populations, activities you implement or the preferences and behaviour of the people exposed to your program. However, you may not have thought of this as evaluation.

Most of us would rather not be told that we need to evaluate our programs because it is one more demand requiring additional time and funding. The reality is that we all conduct evaluation of some kind at some point in our programs. We just need to get good at it and to share what we learn with each other.

Demonstrating the merits and impact of stewardship is the best way to advance the practice and to respond to those who seek proof that stewardship works. Nonetheless, there are other equally important questions; for instance, are we applying the most appropriate and effective strategies? Who benefits from these efforts? What lessons are we learning? By addressing these and other questions, we can improve program effectiveness and this, in turn, leads to better demonstration of program results.

This handbook is designed for practitioners of stewardship programs in the Atlantic Region. The purpose is to provide an introduction to program evaluation and measuring program outcomes. It is designed in binder format as a work in progress, in order to encourage users to test and apply tools, modify the text and add material from their own experiences. We hope people will discuss the ideas in the context of their own programs, thereby helping to dispel fears that may accompany evaluation and to advance the practice of stewardship as a whole.

Space does not allow the inclusion of every aspect of this topic nor of detailed instructions for specific steps involved in evaluation, such as data collection and analysis. For assistance with these methodologies, we include a list of topical books, papers and web site addresses in the section labeled Suggested Resources. We seek your input into how to improve this handbook. Please contact me, Kathleen Blanchard, at kblanchard@intervale.ca. Thank you for your interest in improving the practice of stewardship!

Chapter 1. Introduction

Program evaluation is the systematic, thoughtful assessment of the quality and value of program operations or outcomes, as compared to a set of standards (Weiss 1998, Davidson 2005). It involves asking questions in a focused way, collecting appropriate information, analyzing and interpreting the information and using the results towards some purpose. The purpose may be to make judgments about a program, improve effectiveness or inform decision-making (Patton 1997).

Simply put, we evaluate stewardship programs in order to:

1) improve program effectiveness; and,
2) demonstrate program results.

Anyone can conduct an evaluation: e.g., program staff, volunteers, stakeholder groups or external researchers. In general, the people who use the information gained from evaluation are decision-makers, such as funders and program planners. We would like the primary users to be the people who operate the programs as well as partners, stakeholders and volunteers closely involved. We hope that members of stewardship's community of practice will embrace evaluation in order to improve program effectiveness and demonstrate program results.

Benefits of Evaluation

Evaluation benefits the species and habitats we're trying to conserve by improving our ability to achieve the conservation objectives. It also benefits many people, by providing information to assist with decision-making. The potential benefits of evaluation are enormous.

Using the list below, check any benefits that might apply to your stewardship program and list any additional benefits.

Table 1. Benefits of evaluation

Benefit	✓
Improve project design and implementation	
Ensure program objectives are being met	
Determine how much and where to allocate resources	
Identify strengths and weaknesses	
Describe what works well, what does not, and why	
Provide information to assess program value, make decisions	
Gain knowledge, perspective, insight or skills	
Share lessons learned	
Communicate to stakeholders	
Build capacity and ownership	
Promote recovery and showcase good work	

Whom Will the Evaluation Serve?

When a funding agency or organization asks us to participate in an evaluation, we may not always know the purpose of the evaluation and its intended use. However, evaluation is not principally for external authorities and funders who may be seeking accountability for successes

or failures. When we design an evaluation, we can ensure that our program, the target species and the people most affected benefit! To begin, we can ask ourselves three questions:

1. What do we wish to know?
2. Who might be interested?
3. What is the purpose of the evaluation?

When Shall We Do Evaluation?

Most program managers contemplate doing an evaluation after the activities have been completed or when an existing or prospective funder asks for one. In fact, a good time to evaluate is during ***any*** phase of the program cycle, as illustrated in the model below (Figure 1). When we choose to evaluate depends on our purpose and the questions we wish to ask.

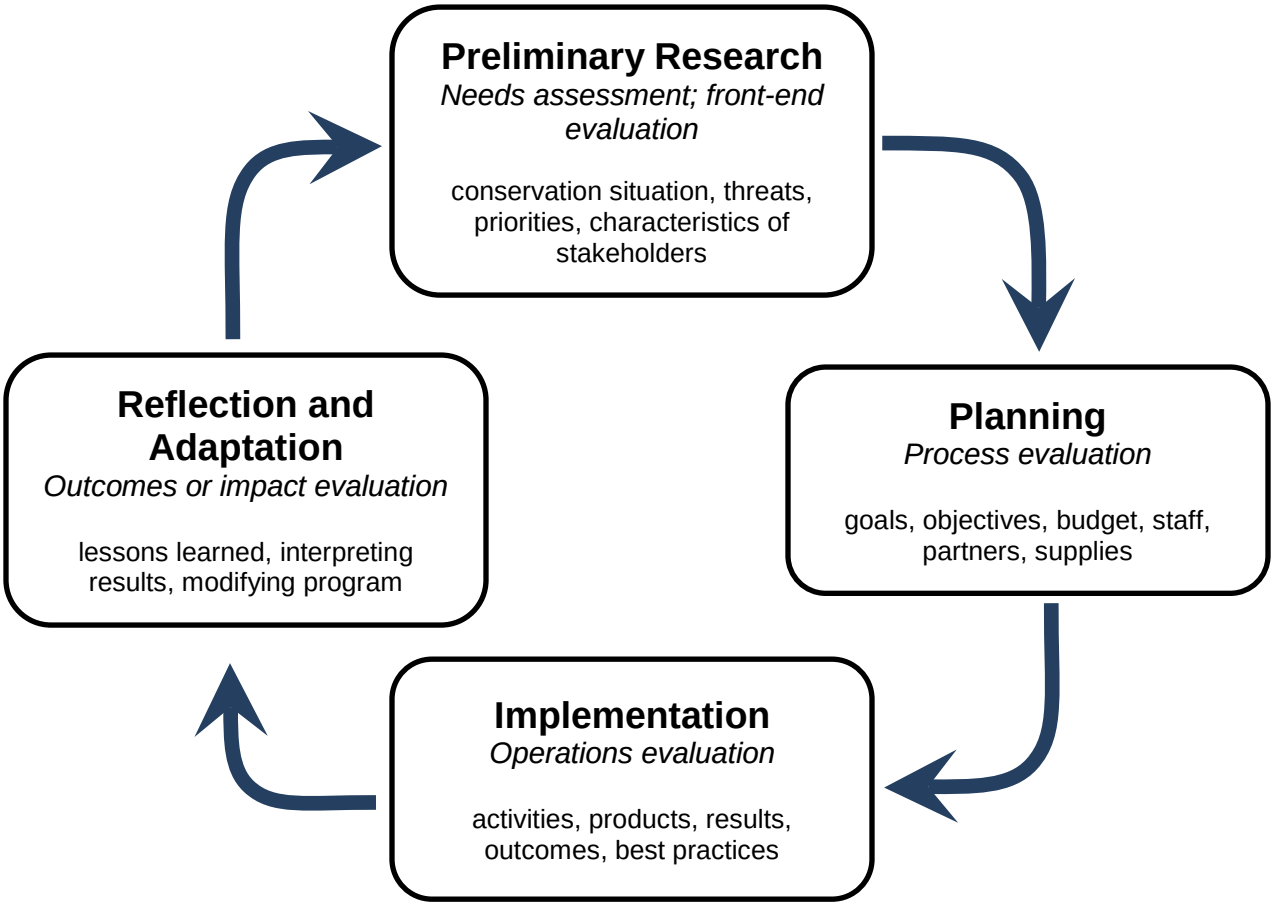


Figure 1. Simplified program or project cycle showing four phases (bold), types of evaluation (italics) and examples of the role evaluation can play during each phase

When we use evaluation to improve program effectiveness, we embrace a more adaptive management approach to programming. We may become more open to new ideas, more collaborative with partners and more inclusive of stakeholders. As learning and adaptation become routine, we may become less fearful of negative results and less intimidated by program critics. As others begin to use evaluation as well, together we can foster a learning culture within the stewardship community of practice. Evaluation becomes integral to our work!

Types of Evaluation

Our purpose for evaluating will determine the type of evaluation we undertake. Table 2 lists general categories of evaluation. The first category, preliminary research or needs assessment, often provides information crucial to the development of a program strategy or campaign. It may also provide baseline information for a future evaluation involving a comparison. For instance, a wildlife agency might collect information from hunters before and after the hunting season. The second category examines the process or operations of a program. This type of evaluation may be required, for example, as part of budgetary review or to assess whether a recovery program is following the recommendations of an approved recovery strategy. A third type, outcomes evaluation, examines the changes resulting from a program, their quality or value and whether they are meeting their short- or medium-term objectives. This type of evaluation may be requested by a government department or agency that operates within a results-based framework. The fourth category, impact evaluation, assesses whether the program is achieving the long-term goal(s). Examples might be achieving species recovery or sustained changes in quality of life. The conservation initiative may require several years before this type of evaluation can be performed.

Each type of evaluation can involve staff, stakeholder or volunteer participation so long as we understand the major sources of bias and take precautions where necessary. If our purpose is to improve the practice of stewardship, then there may be abundant justification for staff participation. We might also seek advice from researchers who could be enticed by the opportunity to explore research questions that have practical application. In cases where accountability is the primary purpose, an outside evaluator might be needed. This would require new or additional funding, since most of our programs operate under modest budgets.

Table 2. Some general types of evaluation and the possible purpose for each

Type of evaluation	Purpose
Formative evaluations: to improve program effectiveness (at the start and through the implementation phase)	
Front-end evaluation (also referred to as needs assessment or preliminary research)	• identify problem severity, root causes or barriers • better understand stakeholder needs/benefits, culture or target audiences • inform program strategies or how to engage people
Formative evaluation (examines program process and operations; may be year-to-year)	• guide program improvement • assess program concordance with recovery strategies, agreements or plans • assess resources: amount and how spent • assess staff/volunteer skill and capacity. May be done year to year.
Summative evaluations: to demonstrate program results, including value (after initial results are achieved and at the completion of the program)	
Outcomes evaluation	• identify changes (short or medium term) to target species, habitat or people resulting from the program • determine the type and quality of results compared to intended results, program objectives or other standard • assess progress towards longer term goals.
Impact evaluation	• assess whether goals are met • assess long term effectiveness or sustainability • assess net effects, social costs and who benefits

Funders often ask us to demonstrate program results. The good news is that the more we work *to improve program effectiveness*, the more likely our program *will demonstrate good results*.

Measuring Program Outcomes

As part of its commitment to the recovery of species at risk, the Government of Canada is seeking evidence that recovery objectives are being met and the money that is being allocated to fund stewardship programs is being well spent. For this reason, we may be asked to focus on achieving program outcomes that relate to those objectives.

Key Point: Outcomes may be defined as the measurable changes or benefits that result from a program's activities.

As we will see, outcomes can be short-, medium- or long-term. They result from program activities, which in turn are part of organized strategies. Examples of strategies used for the recovery of species at risk include mitigation of harm, protection of habitat and education of specific audiences.

When we evaluate programs, we measure operations or outcomes against standard(s). What are those standards and where can we go for help in applying them to our program? We begin by examining recovery strategies and action plans, if available, and consulting with the federal or provincial jurisdiction responsible for the recovery of the species in question, followed by the recovery team if a team exists. For the past few years, members of the working group for the recovery of Piping Plover in the Atlantic Region have been taking this a step further by meeting regularly to develop standards for best practices, signage, volunteer engagement and program planning.

Sometimes, however, recovery strategies and action plans are not very specific with regard to education and stewardship. Jurisdictional representatives may be able to identify species experts, experienced practitioners, community leaders or documents to consult. Currently there are no generally accepted standards within the stewardship community of practice, but we can create them over time if we set our minds to it.

Further Learning: We just described some of the components to program planning and evaluation: objectives, strategies, activities and outcomes. For a glossary of other important terms used in evaluation, please see the list that appears in Appendix A.

Outcomes Can Refer to Species, Habitats, *and* People

Until recently, policies for measuring change have focused on changes affecting the target species or habitat. However, recovery experts agree that most threats to species are caused directly or indirectly by human beings. Therefore, people must be part of the solution!

Stewardship works to create positive relationships between people and target species or habitats. That relationship involves human values and behaviours. In order to better understand those values, how to influence behaviours or to gauge the effectiveness of our programs, at some point we may want to measure characteristics of individuals or social groups. These characteristics might include knowledge, beliefs, attitudes, preferences, aspirations and activities relative to the target species or habitat. We may also want to measure how these characteristics change over time. We can do this as a front-end evaluation, prior to and after an activity, year-to-year or after an extended program intervention. It is important that we remember to link our increased understanding about the human dimensions to the objectives of species recovery.

Sometimes measuring human characteristics, such as knowledge or skills, can be quicker or less expensive than biological parameters of the target species. For instance, turtle species with delayed sexual maturity may require many years before biologists can measure whether head start programs, i.e. captive rearing of young, result in increased population or recruitment. Likewise, it might take years to collect the data needed to understand changes in recruitment of woodland caribou and the field studies would be costly. In contrast, it might take less than a year to determine the percentage of hunters in a particular community that can distinguish between migratory and sedentary caribou herds--information that could be useful to a stewardship program that aims to prevent individuals within the threatened sedentary herds from being killed.

For over 30 years, researchers in the human dimensions of wildlife management have been documenting how people value wildlife and special places, how they want them to be managed and how they affect or are affected by management decisions, the goal of which is to incorporate that understanding into better management planning and more informed decision-making (Decker et al. 2001). This people-oriented approach can be applied to stewardship planning and to the measurement of stewardship program outcomes.

Encouraging Conservation Behaviours

Many conservation and recovery objectives call for the reduction of threats that are directly or indirectly caused by human behaviour. To reduce those threats or to mitigate harm, stewardship programs aim to encourage conservation behaviours. One approach for accomplishing this is the utilization of specific techniques known as social marketing. Community-based social marketing in particular has been shown to produce measurable behavioural change in target audiences within a specific time period. The technique has gained popularity among many funders although some of the terminology in particular has met with disfavour in certain cultural settings.

Other approaches also need to be considered, depending on priorities, scope of impact, timetable and local culture. One such approach is environmental education, which aims to cultivate environmental literacy and informed decision-making. Environmental literacy generally refers to possessing a stewardship ethic as well as certain knowledge, skills, attitudes and behaviours that account for being responsible. Environmental literacy equips people for the future, preparing them to face an array of challenging issues in an increasingly complex world.

Another crucial aspect, particularly for programs operating in Aboriginal communities, is ensuring that the program fits the cultural context. At a minimum, stakeholder groups may wish to adapt the program to local language, norms and cultural traditions during the early stages of program planning. True community-based programs are developed by the community, which in turn partakes in the control of decision-making.

There is no single, simple formula that will guarantee durable conservation behaviour. Some of the most effective multi-year stewardship programs are those that are wholly or partially community-based, utilize a mix of approaches and keep in focus the conservation objectives.

The Challenges of Program Evaluation

Many of us worry about unrealistic expectations associated with program evaluation. The challenges stem from a variety of issues, including:

- insufficient funding, delays in award announcements and cash disbursements
- uncertainty regarding program status year-to-year
- lack of skill or capacity for careful, unbiased evaluation
- too little time, too many other tasks needing attention
- sharing information in a competitive environment
- fear of over-promising and underperforming.

Given these pressures, we can take steps that are appropriate to our own programs. Any amount of evaluation helps build confidence, gain efficiency and improve program effectiveness. Meanwhile, we can support each other, including volunteers, stakeholders, partners and funders. By sharing what works, we will improve the practice of stewardship!

Lessons Learned

- Evaluation is relevant to all phases of program work.
- Every evaluation should have a purpose and an intended use.
- The more we ask questions of our programs, the more we cultivate a culture of learning.

Chapter 2. Incorporating the Community Context into Evaluation

"He chats with people here and there. More important than a brochure."
"Her approach is like that of a friend talking to a friend or a neighbour."

Community members, speaking about stewardship program managers.

The majority of stewardship programs in the Atlantic Region operate in small communities or out on the landscape where one-on-one interactions are important. Community values and cultural norms are important influences of human behaviour.

Effective stewardship programs take a community approach, tailoring the messages and activities to the specifics of local culture. One possible reason why stewardship has not been more effective is that we have focused on the *responsibilities* of stewardship more than the *benefits*.

The people who should benefit are the people most affected by the conservation program. Examples in the Atlantic Region are fish harvesters, beach users, trappers and residents of the limestone barrens of the Great Northern Peninsula of Newfoundland.

In the next sections, we explore this theme for the different types of evaluation.

Community Context: Preliminary Research or Front-end Evaluation

Identifying benefits of recovery

Preliminary research can help us design a program so that the main stakeholder group or target audience will be the people who benefit from the conservation initiative. Focus groups, surveys, in-depth interviews or dockside dialogue can help reveal what those benefits might be and who is likely to receive them.

If we don't identify the benefits ahead of time, stakeholders will often remind us of their importance. For example, many fish harvesters of Newfoundland and Labrador describe wolffish as a "nuisance" to their work, because they are caught accidentally in gear, they eat bait and they compete for commercially valuable species. When a harvester is told to follow recovery recommendations calling for release of wolffish live in the place where they are caught, often he will ask, "For whose benefit am I doing this?" Similarly, when a lobsterman fishing in New Brunswick's Bay of Fundy is asked to participate in a plan for retrieving lost fishing gear, he often asks, "How are you going to help me?"

Identifying barriers to conservation behaviour

Many conditions can create barriers to conservation behaviour. Three examples would be insufficient knowledge of a problem, lack of easy alternatives and conflicting opinions about what constitutes appropriate use. Preliminary research can help uncover the barriers and provide insight into how to address them.

In 2006, the Nova Scotia Piping Plover Conservation Program conducted preliminary research into relevant knowledge, attitudes and actions of beach users along southern Nova Scotia beaches. Results from a survey of 46 beach users demonstrated that about one half of those surveyed could distinguish the Piping Plover from other species and that only about a third

believed that dogs on beaches should be leashed. These and other results informed the program managers where to focus their efforts. They educated beach users about the conservation needs of Piping Plovers and they collaborated more with local conservation officers. During the ensuing years, the results of their efforts paid off, as disturbance to Piping Plover nests declined.

Incorporating community values for sustained stewardship

What are community values? For the Labrador Inuit, examples might be consuming wild foods, living healthy lives and sharing. Actions to support these values might include ensuring that wild food is not wasted, linking healthy fish and wildlife to healthy people and sharing a meal of wild food with family and neighbours.

Within the communities where you work, what are some of the important community values?

Table 3. Community values

By incorporating community values into stewardship programs, we help make the programs more meaningful and beneficial to stakeholders. The conservation or recovery initiative is more likely to be sustainable and just.

Community Context: Evaluating Program Planning and Operations

A formative evaluation can help reveal what works, what doesn't work and how to improve the planning and implementation phases of a program. This can be especially helpful in cross-cultural situations. The following are examples of important themes in effective stewardship operations. Any of them could become the focus of a formative evaluation.

Culturally appropriate dialogue

During the early stages of its work, the recovery team for Labrador sedentary woodland caribou made several attempts to bridge the Aboriginal and non-aboriginal cultures involved in order to develop a cohesive strategy. Along the way, team members learned the importance of face-to-face dialogue and allowing adequate time for listening. For example, when the recovery team organized an initial information meeting in the Innu Nation community of Sheshatshiu, 120 community members arrived--many more than had been anticipated--all expecting to speak about caribou!

Creating partnerships with stakeholders
Another strategy is to design the conservation initiative as a partnership with stakeholder groups. The biologists at the Fundy North Fishermen's Association are partnering with harvesters in the Saint John harbour region to find and retrieve lost fishing gear and lobster traps that are lying on the ocean floor. The gear poses a significant risk to marine species at risk. “They have the knowledge of the ocean; we have the knowledge of the situation for the critically endangered right whale,” says Dr. Catherine Hood of harvesters in her region. “It's not hard for them to see that sharing information will help find solutions for preventing whale entanglement.” Fishermen designed a special grapnel that can hook into “ghost” gear and haul it on board. They volunteer their time to search and retrieve the gear. Meanwhile, fishermen benefit economically because the return of lost gear prevents the owners from having to reinvest in new equipment.

Locally hired staff
Often stakeholders respond to a conservation initiative with less hesitation when the program coordinator is a resident of the local community or region. For example, NunatuKavut hunters in Labrador were less likely to report wolverine and caribou sightings until Wayne Russell, a local Métis resident, was hired to coordinate the stewardship program. Not only was he known to the people but he knew how to elicit their participation. He set up a Facebook page and put out a call for residents to report their sightings via social media. Within a very short time there was a dramatic increase in local reporting of caribou and wolverine.

Building and maintaining trust
When we ask stewardship practitioners for the most important characteristic of a good relationship with stakeholder groups, they cite building and maintaining trust. Initiating a working partnership with stakeholders in an atmosphere of doubt and mistrust can be one of the most difficult tasks for stewardship practitioners, especially when first starting out. How do we build trust? How do we maintain it once established? How do we gain it back once it is lost? Anyone new to the practice of stewardship should be given opportunity to discuss these questions with more experienced practitioners.

Review the following list of principles and add a few of your own ideas.

Table 4. Principles for building and maintaining trust

Making abundant face-to-face contact
Being respectful and taking time to listen
Using clear, understandable language
Providing consistent delivery of information
Becoming familiar with the local culture
Maintaining a consistent point of contact

Strategies for trust-building must be adapted to the particulars of the situation. We asked staff of the Fundy North Fishermen's Association, stewardship experts in the marine sector, for their recommendations with respect to building trust with fish harvesters.

Table 5. Tips for building trust with fish harvesters

Identify who we are and why we are here
Be willing to share life stories but don't burden harvesters with too many details
When asking for information, beware not to infringe on privacy
Invite harvesters to work with us on finding solutions
Meet with harvesters at times convenient for them
Go where they are most comfortable talking: it may be on the wharf or in the cab of a truck
Show an interest in their family and in members of their community

Source: staff of the Fundy North Fisherman's Association.

Community Context: Evaluating Outcomes

When we incorporate community values into our stewardship programs, our programs become more community-based and are more likely to be sustainable. What evidence exists that the change may be long-term? One outcome of sustainable community-based stewardship is that the target audience is linking their needs to the success of the recovery effort. This can be measured through the documentation of ongoing voluntary actions by the target audience.

Linking community needs to the success of the conservation initiative

On the Great Northern Peninsula of Newfoundland, there is growing evidence that residents of the region are linking their needs and aspirations to the success of the rare plant recovery effort. In general, the indicators are people taking voluntary actions to do what is right for recovery in order to achieve some personal or community benefit. This growing trend is a result of years of effort by the Limestone Barrens Habitat Stewardship Program. Biologists associated with the program are recognizing the powerful effect when people link their own culture with ecological recovery.

Here are some examples. When the community of Sandy Cove wanted to restore a local section of the limestone barrens and improve the appearance of their community as a tourist destination, they raised funds on their own and asked the stewardship program staff to send a team of experts to guide the restoration effort so that it would be done properly. Meanwhile a regional snowmobile association worked with the stewardship program to help them design a re-routing of 1km of trail--a plan that would save an estimated 150 rare

plants. When a local women's guild wanted to sell crafts as a means of stimulating local economic development, they decided to use flowering species at risk as in inspiration for their designs for hand crafted quilts, glass and jewelry. Owners of a local Bed and Breakfast tried niche marketing to botany enthusiasts when they named their business after an endangered plant species of the genus *Braya*, which is found in their area. These indicators are creating excitement among scientists and economic development planners alike.

Linking community needs and aspirations to the success of the conservation effort helps to build a sense of community ownership for the program. The Limestone Barrens Habitat Stewardship Program has worked hard at achieving this sense of ownership, as evidenced in widespread adoption of the program's popular slogan, “Ours to Protect!”

Shaping program outcomes to local culture

In our zeal to encourage conservation behaviours, we must not assume at the start that a community's own set of values run counter to conservation. The work of recovery is not a case of imposing new values, but of helping community members to become re-acquainted with their culture's existing core values that are consistent with stewardship. Our programs help people to identify with those values as expressed through local language, social norms and traditions.

An example can be found in the seabird conservation program coordinated by the Quebec-Labrador Foundation (QLF) during the 1980s and 1990s in partnership with residents of the Quebec Lower North Shore. The program aimed to decrease the amount of excessive and illegal harvest of seabirds nesting in federal migratory bird sanctuaries through a combination of education, research and local participation. The people wanted to ensure that not only were the bird populations restored but that the integrity of their culture remained intact.

The existing cultural norm stated that an occasional meal of birds or eggs was acceptable, so long as there was no waste and especially in circumstances of need. Excessive harvesting of seabirds, on the other hand, was frowned upon. The conservation initiative reinforced this cultural norm by promoting conservation behaviour rather than targeting people who violated the law. The program emphasized fun, hands-on learning and showcased expressions of local pride through seabird art and drama. Residents of all ages responded enthusiastically. They linked the conservation goal of restoring depleted seabird populations to the preservation of their culture. Over time, the bird populations increased and the threat of excessive harvest diminished.

Lessons Learned:

- Building and maintaining trusting relationships is a core principle of stewardship.
- Understanding and working within the cultural context helps make stewardship practical, meaningful and sustainable.
- Building a stewardship program around existing community values, rather than introducing new ones, helps build a sense of local ownership.
- Learning from a variety of spokespersons in a community creates a more complete picture and cultivates broader program support.

Chapter 3. Program Planning

"We need to distinguish between investment of effort and real conservation impact."

Stewardship program manager

Describing Our Programs

How we describe our stewardship programs depends on the specific purpose and audience. Sometimes we tell stories, give a lecture using slides or produce a brochure. Sometimes we present data, other times we use photographs. We might contact a newspaper and let the reporter tell the story. If we want to convince a foundation to financially support our program, we write a proposal that includes our program goals and objectives, methods and timetable, the results we plan to achieve and how we intend to report out. In essence, this is a program planning document. We might introduce the program to potential funders and partners using a one page summary that describes the threats, program goal and objectives, the outcomes we intend and the activities we plan for achieving them.

Program evaluation requires asking questions that relate to one or more program components. It helps to have a planning tool that displays the program components and how they are related. Many types of planning tools are available. In this chapter, we describe one such tool that has been adopted by organizations in a range of sectors across North America for several decades. There are many workbooks and web sites that contain helpful instruction for using this tool; we list some of them in the Suggested Resources section.

A Simple Planning Tool

Imagine that we are having a meal at a family-style restaurant with a friend who is trying to organize a stewardship program but does not know where to begin. Our friend has asked us to describe our program--what we are trying to achieve and the steps we take in planning. We figure we have about 12 minutes before the food arrives. The table has been set with plain white paper placemats. We reach for a pencil and on one of the placemats we write some phrases and draw a few arrows. Within a few minutes we have created a diagram of our program.

If we cannot describe the components of our program to a friend within a few short minutes then perhaps we could use some practice. After all, if we tried to explain our program face-to-face with a foundation or funding program officer, we might be given only five minutes.

We can call our diagram a program planning tool, guide, framework, road map, flow chart, logic model or other name. What matters is that we summarize the key components and show how they are linked. Funders, researchers and cooperative extension programs have shown a lot of interest in program outcomes as predictors of conservation success, and it is where we begin.

Outcomes and Indicators

As stated in Chapter 1:

Key Point: **Outcomes** are the measurable changes or benefits that result from program activities.

Outcomes can be:

- results or effects of the activities
- *benefits* to the species, habitat, or people
- *changes* that occur or the difference that is made.

It may help to think of outcomes as results, but in essence they are more than results since they usually describe a benefit or a change. For instance, outcomes may describe an improved status for species or habitat. They may describe a decrease in a threat. They may also describe conditions or changes involving people--their awareness, knowledge, skills, attitudes, opinions, motivations, behaviour or policies.

Here are a few examples of program outcomes:

- reduced mortality of right whales due to vessel strikes
- an increase in the distribution and abundance of Newfoundland marten

How do we know when we have achieved an outcome?

Key Point: **Indicators** are the specific items of data that we track in order to measure how well our program is achieving the outcomes.

Outcomes describe a change as a result of a program; indicators express the specific measurement. Indicators help answer the question, “What are we looking for?”

Some funders insist that indicators be incorporated into our program outcomes. They invoke short-hand reminders that our outcomes need to be specific, measurable, attainable, relevant and timely--think *S.M.A.R.T*. This abbreviated guide or acronym is often applied to writing program objectives as well.

If baseline data are available, we can express a unit of change, for instance, “a 50% reduction in ATV disturbance” or “a 30% increase in volunteers.” If baseline data do not exist, then we may have to settle for a number that represents an achievement or performance, for instance, “the population reached 48 breeding pairs” or, “young fledged successfully from 35 nest boxes.”

Outcomes and indicators are different, but increasingly funders ask us to write *S.M.A.R.T.* outcomes that incorporate indicators. We recommend that, as much as possible, we adopt this approach to writing program outcomes. Notice the more specific wording in the column to the right within the table below.

Table 6. Outcomes and indicators from programs in the Atlantic Region

Outcome		With Indicator
Increased productivity of breeding Piping Plovers in the Atlantic Region.	⇨	An increase in fledging rate to 1.65 fledged chicks per followed pair.
Reduced mortality of right whales due to vessel strikes.	⇨	82% reduction in risk of lethal vessel strikes in the Roseway Basin *Area To Be Avoided.*
Reduced mortality of Newfoundland marten due to accidental catch in snowshoe hare snares.	⇨	75% success holding captured snowshoe hares and 90% release of accidentally captured Newfoundland marten.
Increased understanding of all residents of the Great Northern Peninsula of the importance of preserving limestone barrens habitat.	⇨	Nearly 100% of households surveyed from Port au Choix to Cape Norman know the importance of preserving limestone barrens habitat for local endangered and threatened plants.
Permanent securement of high priority Atlantic Coastal Plain Flora (ACPF) habitat.	⇨	An increase of approximately 100 acres and over 1,000m of shoreline of permanently protected priority ACPF habitat.

When we create a planning tool for future program work, the outcomes we write will be our "intended outcomes." Some planning tools will refer to these as "objectives" or "targets" but usually the meaning is similar. In the blank spaces of the table above, write one or two of your program outcomes, whether intended or actual. To the right of each outcome, re-write the outcome so that it incorporates indicators that you plan to track in order to measure your program's progress towards that outcome.

Writing Outcomes for Education Strategies

Many people have had a more difficult time knowing what constitutes good outcomes for outreach and education. Until now one of the more common indicators used is "number of people engaged" but this does not reveal enough detail and the meaning of "engaged" is unclear. We can measure changes in the behaviour, skill, knowledge, attitude or opinion of a targeted audience, as measured between a baseline and subsequent data. Abundant examples and explanations of how to do this are available in the environmental education and human dimensions of wildlife literature.

Key Point: If we use education strategies for species recovery, we should link the strategies and outcomes to the recovery objectives.

The following table lists some examples of generic program outcomes involving education strategies, and the types of indicators that could be used to measure those outcomes. Many examples are derived from actual recovery or the EcoAction Community Funding Program in the Atlantic Region, while some others are adapted from outcomes described by the Conservation Measures Partnership (see Suggested Resources). There may be some convergent thinking with work done by Environment Canada relevant to the EcoAction and the

Environmental Damages Fund program indicators. Some indicators have more urgency than others for recovery and clusters of some could be arranged in a hierarchical order as a program progresses. *Note that this list has not been edited or approved formally by a jurisdictional authority or by managers of funding programs.*

Table 7. Generic outcomes and indicators for conservation and recovery programs involving strategies for education and mitigation of harm

Outcome	Outcome with indicator
Increased awareness of the conservation issue.	Percent or number change in target audience able to recognize the issue.
Increased understanding of the conservation problem and what is needed.	Percent or number change in target audience able to explain the problem and identify a possible solution.
Increased knowledge about the species and its conservation needs.	Percent or number change in target audience able to identify the species and describe the key conservation concerns.
More positive attitudes about a conservation or recovery initiative, best practice, recommendation or regulation.	Percent or number change in the target audience that demonstrates a preference for support the specific initiative, practice, recommendation, policy, or regulation.
More concern for the conservation issue.	Percent or number increase in the target population that thinks the issue is important.
More willingness to change.	Percent or number increase in the target population that expresses a willingness or commitment to change.
Increased adoption of specific conservation behaviour.	Percent or number increase in the target audience that practises specific conservation behaviours that mitigate harm or benefit the species/habitat. (Examples: use modified gear, observe pet leash or ATV regulations, avoid collisions, release accidental catch, delay cultivation or mowing.)
Conservation behaviour endures over time.	Percent or number increase in the target audience that continues to practice specific conservation behaviours that mitigate harm or benefit the species/habitat.
Increased compliance with regulations affecting species at risk or their habitat.	Percent or number fewer violations, observed or reported.
Conservation knowledge, values, attitudes or behaviour spread to other species/habitats/issues.	Percent or number increase in the target audience that demonstrates conservation knowledge, values, attitudes or behaviour towards a new species/habitat/issue voluntarily.
Shared knowledge of lessons learned among new or wider audiences.	Percent or number increase in multiple audiences that can describe effective strategies or activities that were learned from this program.
Reduction of human caused disturbance or threat.	Percent or number fewer mortalities or other disturbances. (Examples: nest failures, accidental catch, collisions or entanglements.)
Reduction of human caused disturbance or threat.	Percent or number increase in target audience that follows best practices, recommendations or regulations, e.g., use modified gear, observe leash and ATV regulations, avoid collisions.
Species status is improved, population or distribution is increased.	Change in species listing; number or percent increase in population or distribution range.
Increased collaboration on this or future recovery	Percent or number increase in stakeholder groups

Outcome	Outcome with indicator
initiatives.	and partner organizations collaborating on recovery initiatives.
Increased public engagement, i.e. people, in the work of recovery.	Percent or number increase in target audience engaging in recovery activities.
Increased public engagement, i.e. hours, in the work of recovery.	Percent or number increase in the hours of effort by the target audience in recovery activities.
Increased retention of volunteers engaged in the work of recovery.	Percent or number increase in target audience that continues to volunteer for recovery work year after year.
Increased self or community-initiated learning, training or action for conservation or recovery.	Percent or number increase in target audience that voluntarily seeks conservation knowledge, expertise, training or partnership or takes action for their own initiatives.
Stronger environmental ethic in target community or region.	Number of instances in which target audience demonstrates increased conservation knowledge, attitudes, skills, values, issues discernment or informed decision-making over new conservation issues.
Recovery becomes integral with local culture.	Number of cultural expressions or features such as local words, traditions, songs, other art forms, crafts, buildings, tools, etc. that are linked to the success of recovery.
Concepts and important learning outcomes for recovery of species at risk are adopted and infused into the school curriculum.	Number of concepts, lessons and learning outcomes that are taught by school teachers and included in the approved curriculum.

Inputs and Outputs

Our friend would like to know what steps we take in order to achieve our program's intended outcomes. For this we need a few more terms.

Key Point: Inputs are the resources that go into a program, including staff time, materials, money, equipment, facilities and volunteer time.

Inputs are what we invest in the program. They help answer the question, “What do we need?”

Key Point: Outputs are direct *products* of program activities and are an indication of project *effort*. Outputs can be:

- activities that we do
- people we are trying to reach
- products or services we provide.

Outputs are usually expressed as numbers of people, products, services, space, types or actions. An example would be, “Forty members of the Fish, Food and Allied Workers union attended a public meeting about the *Species at Risk Act*.”

On the whole, we are very good at describing program outputs. We love to talk about the activities we do and the people we serve. Feedback also reinforces the emphasis on outputs, for instance, people may judge an event's success according to attendance. Moreover, our program outputs demonstrate good value for the money invested: we deliver with greater

efficiency and less cost than organizations carrying heavy administrative burdens. However, indicators such as the number of people reached or the number of brochures distributed do not answer why these activities or services are important.
Describing clear, measurable program outcomes is more difficult than enumerating the program's outputs. Yet as we become more focused on program outcomes, our programs likely will become more successful for conservation and recovery. That will be very good news for stewardship!

Testing our Understanding

For each of the following hypothetical examples, indicate with a ✓ if the statement is an output or an outcome.

Table 8. Outputs versus outcomes (see Appendix B for answers)

Description	Output	Outcome
There was a 40% increase in the number of trappers using Newfoundland marten hair snagging boxes from 2011 to 2012.		
The Fish, Food and Allied Workers held information meetings about the *Species at Risk Act* in four communities of western Newfoundland in 2003.		
During August, 2009, 300 leaflets about Furbish's Lousewort were delivered to homeowners along the Saint John River.		
Within four years since recovery measures were introduced, more than 98% of fish harvesters interviewed in NL stated that they were releasing wolffish live and in the place where they were caught.		
By 2015, 500 acres of river frontage along the Miramichi River will be secured under stewardship agreements.		
During the 2010 nesting season there was a 50% reduction in people tracks inside symbolic fencing around Piping Plover nests at White Sands Beach as compared with 2009.		

What resources exist that can help us in writing program outcomes? For starters, we can check the existing Recovery Strategies and Action Plans, but these often contain little detail when it comes to describing education strategies, especially for how to encourage conservation behaviour. We can also check for any relevant studies, such as human dimensions or environmental education research, social and economic assessments, strategic plans or curriculum objectives. Conducting preliminary research--such as a focus group with stakeholders, a survey of beach users or observation of ATV users--might help determine what outcomes are most relevant to the conservation objectives and what indicators address most closely the priority threat.

Planning Programs for Conservation Behaviour

Education strategies can encompass a range of outcomes that address change in awareness, knowledge, attitudes, skills, aspirations and behaviour. Which of these outcomes is most likely to lead to the adoption of conservation behaviours that will mitigate harm, reduce threats or preserve habitat? The answer depends on the situation, information we gain from front-end research and our theories or assumptions about what contributes to change. Theories about how to influence behaviour differ. Abundant research over the past 40 years in the fields of social psychology, environmental education and cooperative extension has increased our understanding but unfortunately there are no fool-proof prescriptions that can be applied to every situation.

Research demonstrates that awareness alone does not necessarily influence people to change. Therefore, we should target our awareness building initiatives to specific audiences and, where possible, address other parameters as well. Some researchers encourage us to address attitudes, which are influenced by values, since they believe that attitudes are better influencers of behaviour (Manfredo et al. 2004, Vaske 2008). On the other hand, social marketing researchers suggest using their highly focused techniques to target specific conservation behaviours (Mackenzie-Mohr and Smith 1999). If we want to cultivate environmental literacy, then we might use education programs that nurture people's knowledge, attitudes, skills, social norms and personal ethics as well as behaviour (Monroe 2003). If we want our stewardship programs to have broader application than the immediate threat or target species, then we would be wise to address both behaviour *and* a stewardship ethic. Ethic, in this case, refers to the combination of awareness, knowledge, values, attitudes, skills and behaviour that leads to responsible decision-making, both now and in the future.

What kinds of activities will address the range of factors that affect human behaviour? In most cases involving recovery actions, information materials and slide presentations are not enough. Cultivating stewardship comes about through a combination of activities that involve personal interactions and build positive relationships. These may include face-to-face dialogue, peer exchange and mentoring of volunteers, to name just a few. Appendix C lists several of the types of activities developed and materials produced to address recovery of species at risk, as reported by program managers of 20 stewardship programs in eastern Canada (Intervale 2010).

Sometimes it can be more effective to put off distributing information until a more collaborative relationship is built. For instance, the seabird conservation program along the Quebec North Shore that addressed illegal hunting practices in the early 1980s used a variety of engaging activities for different age groups long before introducing a pocket guide to the regulations. By the time the guide was introduced, the local mayor had agreed to write a supportive statement for the publication's preface and community residents were solidly behind the program's objectives.

The reality is that we need to mitigate threats and encourage conservation behaviours quickly and efficiently, using limited budgets, while working in real life situations with all their demands and challenges. Our collective experience as stewardship practitioners offers excellent opportunity to learn from each other what works and what does not work in practical settings. We can share what we learn and the products we produce. We can listen to stakeholders and consult with them as co-workers in recovery. We can seek advice from elders in Aboriginal communities. Ongoing learning will help us develop the most effective strategies for species recovery.

Planning Tools: Logic Models

A logic model is one of several tools that can help with program planning and evaluation. A logic model displays the sequence and relationship of a program's various components. It shows how these steps are linked.

Logic models have been around for more than 40 years and in some form or another have become a practical framework for programs operating in public, private and nonprofit sectors. In the early 1970s, Claude Bennett (1975) developed a program model that demonstrated a hierarchical chain of cause and effect involving steps from inputs to outcomes over time. Program impacts were sometimes not seen until long after the programs ended. His hierarchy helps to explain why it may take several years before the effects of a stewardship program can be realized.

Over the past two decades, several planning tools and models have been developed, many with an emphasis on outcomes measurement. Outcomes measurement has been promoted in the nonprofit sector by United Way, several grant-making foundations, academic institutions and Cooperative Extension programs. During the same period, several authors described effective education and collaboration strategies for conservation on the basis of measuring and evaluating results (Blanchard 1987, Blanchard and Monroe 1990, Blanchard and Nettleship 1992, Pomerantz and Blanchard 1992, Blanchard 1994, Jacobson 1995). More recently, the conservation community has shown considerable interest in ways to improve the practice of conservation, with some researchers embracing outcomes as better predictors of conservation success (Kapos et al. 2009). The Suggested Resources section lists a few of the relevant papers.

Many people report difficulty working with logic models and linear frameworks. Short term projects may be relatively easy to describe; more complex or long term programs can be challenging to fit into one simple framework. In cases involving programs lasting several years, addressing multiple threats or targeting many audiences, it might be more practical to describe a portion of the program, for instance, how the program addresses a particular threat. Other weaknesses that have been reported about logic models are that they:

- do not factor in dynamic aspects to real world situations
- become outdated quickly as recovery priorities and threats change
- do not factor in broader issues of sustainability, social justice, economic impacts.

Nonetheless, logic models can be a great way to organize the components of our programs and to show how they are linked in leading to the conservation goal.

The following is a basic logic model that has been adapted from ones developed by the University of Wisconsin Cooperative Extension program (Taylor-Powell and Henert 2008). A useful downloadable publication may be found at the web site address listed in the Suggested Resources section.

Notice that the outcomes are divided into three categories: short term (1-2 years), medium term (2-3 years) and long term (4 or more years). The precise time period can vary, but with each advancing time period our program moves closer to the ultimate conservation goal. In general, a stewardship program that has been in operation for more than two or three years should aim for medium term outcomes.

Sometimes circumstances create barriers that make medium term outcomes unobtainable. These might include:

- The main threats to the species have not been identified.
- The conditions are too dynamic or the program lacks stability.
- Critical information may be unobtainable or off limits.

The planning tool is very helpful when developed during the early stage of program planning. We can fill in information under each heading by working from left to right, beginning with program inputs. Many people find it more useful to work from right to left, beginning with our goal or long term outcomes, and thinking through the steps that would be needed to reach them. A planning tool is not a prescription for success, nor are the results guaranteed. We should not hesitate to modify the content as the program advances.

When we look back on programs, we sometimes discover outputs and outcomes that we did not intend, such as participation by people who were not part of the program's target audience. Here again the planning tool can be useful in a retrospective manner, helping us to understand what led to particular program results.

Inputs	**Outputs**		**Outcomes**		
	Activities	Participation	Short Term	Medium Term	Long Term
Staff money, time, materials, partners, volunteers, research.	*Services, events, workshops, products, publications, media.*	*Primary target audience, secondary audience, stakeholders, partners, community members.*	*Changes:* *Target species or habitat--life cycle conditions, threats.* *Human--e.g., awareness, knowledge, attitudes, skills, motivations, opinions, behaviour.*	*Changes:* *Target species or habitat--life cycle conditions, population, status, distribution, threats.* *Human--e.g., knowledge, attitudes, skills, , behaviour, social action, policies, informed decision-making.*	*Goal reached and sustained relative to:* *Target species or habitat-- life cycle conditions, population, status, distribution, threats.* *Human--e.g., environmental literacy and ethic, informed decision-making, sustained benefits or improved human welfare.*

Figure 2. A simplified logic model for a generic stewardship program
(Adapted from Taylor-Powell and Henert 1998, Ernst et al. 2009)

Further Learning: A planning tool worksheet in the style of a logic model may be found in Appendix D. Try to complete the model with information from your own program. If you prefer, start with a blank piece of paper or go have a cup of coffee with a friend and create your own planning tool for describing your program.

Other Program Planning Tools

In reality, stewardship programs operate in a dynamic environment influenced by a range of social, economic, cultural, political and climate-related factors, which neither project managers nor recovery teams can control. Logic models do not portray the adaptive management approaches taken by managers working within complex systems over a period of years. They also do not illustrate the feedback loops resulting from evaluation and learning and the program modifications that ought to occur both during and after the evaluation.

The results chain model is a promising alternative planning tool. It draws on adaptive management principles promoted by the Conservation Measures Partnership's Open Standards for the Practice of Conservation. Here is a general illustration of the main components to a results chain, taken from the document, *Using Results Chains to Improve Strategy Effectiveness: An FOS How-To Guide*, from the Foundations of Success (FOS).

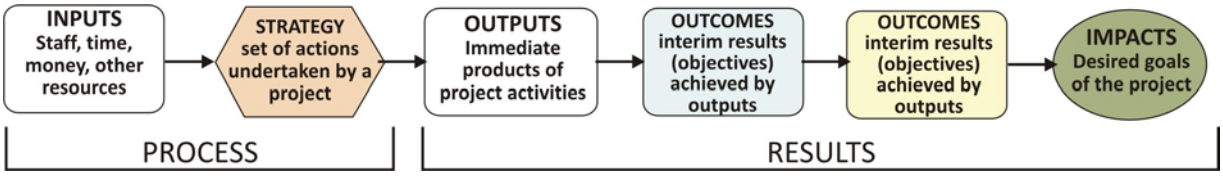


Figure 3. General model of a simple results chain for a conservation program
(Source: Foundations of Success 2007. Note: colours have been changed.)

The chain is based on assumptions about what we believe a program can produce. These assumptions are linked in an "if...then" causal relationship. For example, in Figure 4, illustrating a media campaign for the recovery of a population of sturgeon in Russia, IF consumers prefer not to eat caviar THEN there will be a decrease in the demand for caviar. The model helps us work through how our activities will result eventually in achieving our goal. The model is expandable, allowing additional boxes to be added, such as the box between Objective 1 and 2 in Figure 4. Program objectives appear as intended outcomes.

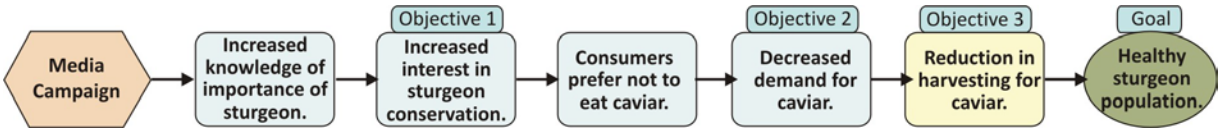


Figure 4. Simplified results chain of a program for sturgeon recovery
(Source: Foundations of Success 2007. Note: colours have been changed.)

An explanation of how to use a results chain requires more space that can be provided here and we regret that the examples illustrated may appear a bit oversimplified. In the case of the sturgeon recovery program, we know that an increase in knowledge does not necessarily lead to changes in attitudes and behaviour. The chain would be expanded into a more complex

model to illustrate details about the campaign and how it affects such things as attitudes and motivating influences, which when combined might lead to change in consumer practices.

Another planning model is the eeCommunity Map, a project still in its development stage, which shows promise as a more fluid and dynamic model that can illustrate a broad array of factors. This tool may be available in the near future.

Making Assumptions

With all program planning, we make assumptions based on underlying principles that guide our program approach because we believe they are effective. Our assumptions might be based on principles of wildlife management, environmental education or social marketing. Some of our assumptions might be based on local knowledge, what we read in the newspapers or intuition. Discussing our strategies within a community of practice will help us to recognize our assumptions, to question their validity and to use them appropriately.

Further Learning: What assumptions are we making about different aspects of our programs, e.g., the species, threats, inputs, activities, people, outcomes and how to influence change?

Lessons Learned:

- By measuring outcomes, we can demonstrate the benefits of our programs and why our programs need support.
- Planning tools help us to sharpen our focus on outcomes and to plan the steps needed in order to achieve them.
- In our effort to link outputs and outcomes, we need to be aware of the assumptions we are making and take particular precautions if drawing conclusions about causal relationships.

Chapter 4. Using Planning Tools to Focus an Evaluation

"There is no doubt in my mind that we are having great conservation outcomes but we are not proving it enough."

Stewardship program manager

The first steps in planning an evaluation are to clarify:

1. the purpose of the evaluation;
2. for whom it is being done; and
3. how the information will be used.

Try to answer these questions relative to your own program and how **you** might make use of the information. Your responses to these questions should influence what questions you ask in an evaluation.

Table 9. Planning an evaluation for my program

What do I want to learn from the evaluation?	
Who other than myself might learn from it?	
How might I use the information to benefit my program?	

Using planning tools to focus the questions

Next we can use a planning tool such as a logic model to help focus the evaluation. In the model below, we have added a row of boxes that relate to evaluation. The questions we ask depend on the purpose of our evaluation--what we want to learn. Questions that address the inputs and outputs help us to improve our program's operations or effectiveness. Questions about outcomes help us to assess program results and whether those results are the ones we need in order to meet our recovery objectives.

Inputs	Outputs		Outcomes		
	Activities	Participation	Short Term	Medium Term	Long Term
What we Invest	What we do or provide	Who we reach	What results	What results	What results
Evaluation					
e.g., Did we invest enough human and financial resources? Do we need to invest in further up-front research?	e.g., What happened? Did we convey our messages in a timely manner? Did we choose the most effective activities?	e.g., Who participated? How many? Did we reach our intended audience?	e.g., What do people know, think or do as a result of the program? Which activities were most effective? How was harm to the species mitigated? What changes occurred to the species or habitat?	e.g., How has harm been mitigated or the threat diminished? What species life cycle changes or habitat improvements have occurred? What conservation behaviours have people adopted as a result of the program? What lessons have we learned?	e.g., How has the species' status or distribution changed? How have the target audience or stakeholders benefited? Are conservation behaviours sustainable?

Figure 5. Program planning tool with sample questions for evaluation
(Adapted from Taylor-Powell and Henert 2008, Ernst et al. 2009)

Key Point: Many funders are interested in questions that relate to outcomes. If we are asked by a funder or another organization to do an evaluation, it is best to find out what exactly they hope to learn and the types of questions they are asking before we embark on the evaluation.

Identify the Threats and Recovery Objectives

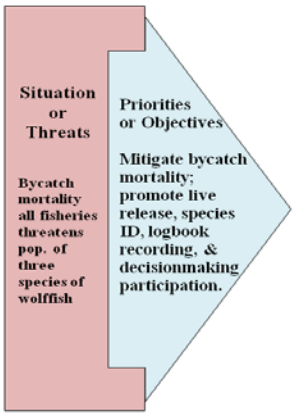
We need to add another important category to our planning tool: the threats affecting the species or habitat. More than ten years ago, it was not uncommon for programs seeking funding for recovery work to describe their activities without explaining how those activities would address one or more known threats to the target species. That has now changed, as the conservation community realizes the urgency of recovery and the need to tailor our programs to address specific threats. As we prepare our planning tool, we might be tempted to record all threats affecting the species, but it is recommended that we record only those threats that our program will address. In some instances, we do not know the specific threat(s), but we can describe the situation. In the sample that appears in Figure 6 below, we have filled in the section

called “situation or threats” with a description of the specific threat that our program is addressing.

Finally, we will add one last category: the priorities or objectives. These might be objectives or actions recommended in a recovery strategy or action plan. If a recovery strategy does not exist, it might be priorities set by a jurisdictional authority, a resource expert, stakeholders or the community. The priorities listed in Figure 6 are taken from the Recovery Strategy for Northern and Spotted Wolffish and the Management Plan for Atlantic Wolffish in Canada (Kulka et al. 2008).

Using Planning Tools to Evaluate Outcomes

A planning tool such as a logic model can be useful for depicting program outcomes. In the following model for a multi-year wolffish stewardship project, we divided our outcome categories into the intended outcomes (“proposed”) and those that actually occurred (“actual”).



Inputs	Output		Outcomes		
	Activities	*Participants*	*Short Term (1-2yrs)*	*Medium Term (2-3yrs)*	*Long Term (4-10yrs)*
			Proposed		
Workshops, trainers, stewards, fishery Observers, funding, info. Materials, evaluation tools.	Dockside dialogue 91 communities; 10 workshop & kitchen focus groups; 20,000 ID cards; 300 DVDs mailed; 3 industry news articles; 11 school visits	550 harvesters in dockside dialogue; >200 at workshops; 100 industry leaders issued DVDs; all grades 11-12 sent DVD.	100% of 15,000 fishers aware of SARA and wolfish ID. Data on % of fishers who support recovery actions.	Near 100% compliance; 100% skilled in live release; 20% increase in logbook recording; higher % support SAR listing.	100% practice live release, 75% logbook recording; voluntary participation in decisionmaking. Impact: pop. Increase all species.
			Actual		
			80% fishers ID the species, 99% knew regulations; 10% record logbooks; 80-94% did not agree with listing; 89% release live.	Increases in knowledge and actions: 99% know regulations; 48% record logbooks; 98% release live. Estimated # of fish released.	49% record logbooks; 100% release live; post DVD viewing, improved support for recovery. Species to be re-assessed in 2010.

Figure 6. Program planning tool for a stewardship program for wolffish
(Source: Intervale Associates 2010. Template adapted from Taylor-Powell and Henert 2008)

We can see that the wolffish stewardship program that was organized by Intervale came close to achieving the short term outcomes that had been proposed and demonstrated considerable progress in the medium term, based on results from an Intervale questionnaire. On the other hand, one proposed long-term outcome of achieving a 75% participation rate in logbook recording proved to be more challenging. This outcome, however, has since been addressed through further discussions by Fisheries and Oceans Canada, the Fish, Food and Allied Workers union, and harvesters in many parts of the province.

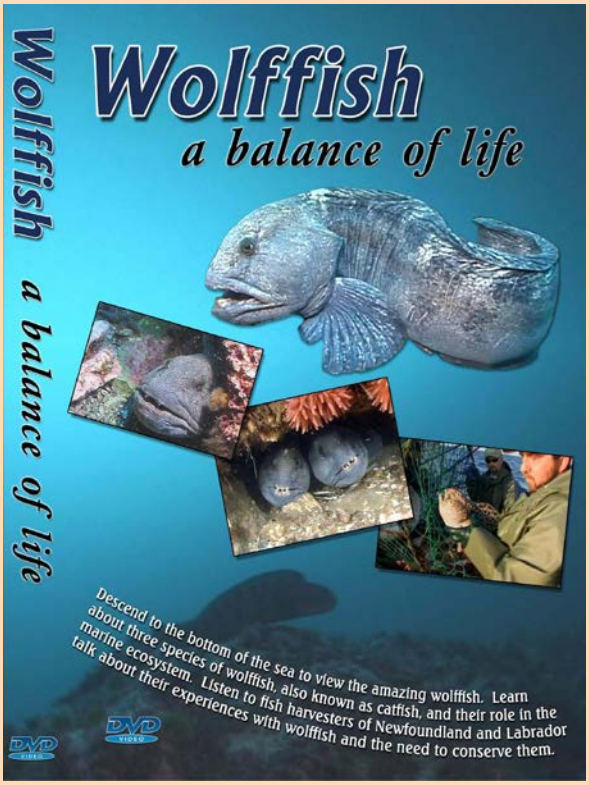
In this example, the outcomes of a stewardship project for the recovery of three species of wolffish address not only the status of the species but the knowledge, opinions and actions of key stakeholders, i.e. fish harvesters. The recovery actions of harvesters are considered vital to wolffish recovery.

Logic models do not reveal everything that may be important about a program. As stated in Chapter 2, we can be so focused on the more measurable conservation behaviours that we miss out on other factors that would contribute to authentic stewardship, such as caring and voluntary actions. The case describing stewardship of wolffish demonstrates how a formative evaluation led to a shift in program activities in order to encourage conservation attitudes and behaviour that would be long-lasting.

Further Learning: Try to fill in the logic model worksheet that appears in Appendix E, being sure to include information about threats and priorities.

Evaluation Informs a Stewardship Strategy for Wolffish Recovery

Information gained from dockside dialogue between Intervale staff and approximately 350 harvesters in Newfoundland and Labrador over a five year period revealed that while nearly all harvesters were complying with the priority conservation action to release wolffish live, many did not agree with the rationale for the action. Based on this information, Intervale shifted its focus in order to help harvesters understand the ecological role of wolffish and the benefit wolffish provide in helping to preserve the habitat of commercially valuable species. Intervale produced an educational video, which highlighted comments by harvesters and underwater photography of wolffish. Harvesters were influenced by their peers and fascinated by the underwater scenes. When Intervale staff interviewed harvesters six months after watching the video, harvesters demonstrated increased understanding of the role of wolffish and greater support for recovery. (For information, contact info@intervale.ca)



Outcomes are Better Predictors of Recovery

What are meaningful outcomes of stewardship programs? Which types are the best predictors of conservation success? Which ones are the best measures of progress for the recovery of species at risk? The stewardship community of practice is experiencing a gradual shift from measures of implementation, i.e. *outputs*, to that of results, i.e. *outcomes*. This change does not come easily to program managers, especially when reporting on education strategies, where for many years the reporting emphasis has been on outputs, e.g., “number of people reached”.

Multi-year projects with access to baseline data are better equipped for reporting outcomes in terms of units of change, e.g., 30% decline in ATV disturbance, 50% fewer collisions by ships, or 45% increase in the proportion of landowners able to identify endangered plants. For projects without a baseline, even short-term outcomes have value in that they can provide ecological and social feedback for adaptive management planning to improve program operations, guide decision-making processes, strengthen stakeholder interactions and demonstrate initial conservation progress.

Meaningful indicators for recovery of species at risk rely upon knowledge systems and a strong link with recovery objectives outlined in recovery planning documents. For instance, since researchers have determined that individual birds within the breeding population of Piping

Plovers in Eastern Canada move from beach to beach and from province to province, changes to the breeding population for eastern Canada as a whole are better indicators of overall status than are data from individual beaches or provinces. Assessing recovery progress on a broad geographic scale requires program managers to communicate their results in a coordinated manner among recovery practitioners.

The Eastern Canada Piping Plover Working Group is engaged in identifying the best indicators for minimizing the threat of human disturbance to Piping Plover on beaches during the breeding season. The group consists of program managers and staff, recovery team members and jurisdictional representatives from federal and provincial governments. For years, they focused on outcomes that addressed life-cycle or population indicators of the species, e.g., productivity and total number of breeding pairs in the region. In recent years, they broadened their efforts to include outcomes that address the reduction of human disturbance--one of several priority threats. Working in a coordinated fashion, program managers are collecting data at their respective sites in order to measure progress in the reduction of disturbance. Indicators they are tracking include:

- number of walkers on wet sand within Piping Plover nesting habitat
- number of people inside roped areas protecting nesting habitat, as indicated by human tracks in the sand
- number of dogs off leash on beaches where Piping Plovers breed and number of incidents of dogs chasing plovers.

The coordinated approach by the Working Group fosters a culture of learning in which we work together to improve the practice of stewardship! For information, contact Karen Potter of Environment Canada: karen.potter@ec.gc.ca .

Choosing the Right Indicators for Measuring Outcomes

What are good indicators appropriate to stewardship programs? There are no established rules or formulas but experience tells us that good indicators have one or several of the following criteria:

- *knowledge-based*: deriving from science, Aboriginal or local knowledge about the target species, habitat, threats or socio-cultural context
- *positive*: relating to the improved condition, performance, quality, status or quantity of the target species, habitat or people
- *ethical and safe*: designed with a concern for people's welfare and safety
- *S.M.A.R.T.*: specific, measurable, attainable, relevant and timely
- *holistic*: applying to conditions or actions that are not motivated solely by laws or the use of force but through voluntary actions stemming from personal or group ethics or other intrinsic factors.

Stewardship Brings Results:
Newfoundland Marten

Recovery efforts for the Newfoundland marten, a genetically distinct population found only in insular Newfoundland, achieved an important benchmark in 2007 when its status was improved from *Endangered* to *Threatened*. Increased distribution and abundance are important conservation outcomes resulting from better land use planning, research and stewardship. Habitat protection and cooperation among trappers have led to fewer marten being caught accidentally in traps. Regulations for snaring snowshoe hares permit only 22 gauge brass wire or six-strand picture cord, which are effective in releasing accidentally captured marten. The number of volunteers engaged in a marten hair snagging program to monitor distribution increased from 5 to 81 during the program's first two years. The positive momentum is resulting in important secondary outcomes that point to the public's growing sense of ownership in the conservation effort, as evidenced by trappers becoming less reluctant to report incidental catch, cabin owners adopting best practices for forest habitat conservation and the general public becoming more informed about recovery. These secondary outcomes increase the likelihood of sustained recovery for Newfoundland marten. Information contributed by researcher Emily Herdman of the NL Wildlife Division, http://www.env.gov.nl.ca/env/wildlife/ .

Lessons Learned:

- Before embarking on evaluation, know the purpose of the evaluation, for whom it is being done, and how the information will used.
- Meaningful indicators for recovery of species at risk rely upon knowledge and a strong link with recovery objectives.
- Discussing outcomes and indicators with other stewardship practitioners--particularly those working on the same species, populations, habitats or threats--helps shift the focus from outputs to outcomes for achieving conservation objectives.

Chapter 5. Choosing the Right Data Collection Tools for Evaluation

"Engaging volunteers was the most difficult thing. It's boring standing on the beach."

Stewardship program manager

We will now develop a plan for an evaluation and examine appropriate data collection tools. First, we offer some examples taken from actual stewardship programs for species recovery. We have adapted a useful matrix developed by a team of environmental education researchers for a training course on evaluation offered by the U.S. Fish and Wildlife Service's National Conservation Training Center. An evaluation plan helps keep in focus the questions we wish to ask, indicators of outcomes, and how we will go about collecting data. The samples that appear in Tables 10 and 11 are but a few of the several questions that might be asked in a typical evaluation.

Planning an Evaluation: Two Examples

Table 10 refers to the same wolffish stewardship program in Newfoundland and Labrador that was described in the logic model presented in Chapter 4. The first question was asked as part of preliminary research, to guide the development of a stewardship program and to create a baseline of information that was used for comparison purposes as the program progressed. The target population was 15,000 active fish harvesters in the province, so for practical purposes we sampled the population. We chose an in-person interview approach conducted at port while harvesters were working at their vessels because we needed to build a positive relationship for a long term stewardship program. We generated our list of questions and asked them in a semi-structured interview format so that harvesters could discuss topics in the order in which they were most comfortable. We called the conversational style, "dockside dialogue."

Table 10. Wolffish stewardship evaluation plan (Newfoundland and Labrador)
(For information, contact info@intervale.ca)

Evaluation Questions	Indicators (target)	Information Sources	Tools	Design and Sampling
Do fish harvesters of NL know how to identify three species of wolffish found in Atlantic waters?	After the first two years, 80% of active harvesters are able to identify northern, spotted, and Atlantic wolffish based on 8" x 10" colour photographs.	Active fish harvesters	Harvester questionnaire administered in person in a semi-structured format	Sampling of active fish harvesters across NL, intercepted in person dockside while at port.
Has the percent of active harvesters releasing wolffish live increased over 2-3 years?	After 4 years, 98% of harvesters were releasing wolffish live--an increase of 9% compared to the second year.	Active fish harvesters	Harvester questionnaire administered in person each year in a semi-structured format	Repeat sampling of active fish harvesters across NL, intercepted in person dockside while at port.

Next we will examine an evaluation plan for the awareness-building component of the Limestone Barrens Habitat Stewardship Program on the Great Northern Peninsula of Newfoundland. The region is extensive enough that differences exist among the various communities regarding the level of awareness and knowledge about the rare plants of this unique and fragile habitat. The program manager used household surveys in several communities in order to guide decision-making about where to focus program effort.

The first row of Table 11 presents a portion of an evaluation plan for the survey work that took place. The example is from the town of Flower's Cove, where in 2001 a household survey found that 22% of households were aware that the limestone barrens contain rare plants. The program manager decided to repeat the survey one year later (2002) in order to track short term progress and again in 2007 for a medium term measurement.

Table 11. Limestone barrens stewardship evaluation plan, adapted from actual evaluation but modified for illustration purposes
(For information, contact lbhsp@nf.sympatico.ca)

Evaluation Questions	Indicators (target)	Information Sources	Tools	Design and Sampling
Since the stewardship program first began, has there been an increase in the percentage of residents of select communities of the Great Northern Peninsula of Nfld who are aware that the limestone barrens contain rare plants?	After one year, 50% of heads of households will state that they are aware of the presence of rare plants on the limestone barrens, as compared to 22% during the program's first year. After six years, 75% will state that they are aware of the presence of rare plants on the limestone barrens.	Heads of household	Household questionnaire administered in person to head of household.	Questionnaire administered in select communities, all households, in intervals of 1 and 5 years.
Same question	After one year, elected leaders, heads of local businesses and schools, and economic development officers of specific communities will report that 50% of households are aware of the presence of rare plants on the limestone barrens, as compared to 15% during the program's first year.	Elected leaders, heads of local businesses and schools, and economic development officers in the three target communities.	In- person interviews	Interviews conducted in person with key opinion leaders from a cross section of sectors.

As it turns out, the actual follow-up household survey conducted in Flower's Cove in 2002 showed that the awareness level more than doubled, from 22% to 57% and that by 2007 the awareness level reached 85%! In this case, the program achieved and surpassed its objectives for awareness building.

Conducting an evaluation of this type while also running a large stewardship program has its challenges. The Limestone Barrens Habitat Stewardship Program is a good example of how to conduct evaluation in spite of limitations of staff and budget. In order to collect the data needed, the program collaborated with the Conservation Corps of Newfoundland and Labrador on the hiring of a four-member Green Team. The team members, who were residents of Flower's Cove or the surrounding communities, were trained in interview techniques so as to achieve consistency in administering the questions and to maximize the reliability of the data gathered.

The second row of Table 11 presents a hypothetical plan for an additional data collection method that could be used; it is included here for illustration purposes. Using a more in-depth interview technique with local opinion leaders enables a program to gain a more comprehensive picture of the changes occurring and insight into strategies for going forward. This practical tool

for evaluation is suitable for many stewardship programs, as it also helps to build relationship with stakeholders and partners--a key ingredient to program sustainability.

Further Learning: What three questions would you like to ask about your program? Do the questions relate to recovery objectives for the target species or habitat?

Choosing a Data Collection Tool

Now that we know what questions we wish to ask, we can examine some of the most commonly used data collection tools and select appropriate ones for an evaluation. Table 12 compares seven of these tools, describing their purpose and a few of the advantages and challenges associated with each.

Table 12. Comparison of common data collection methods for evaluation

Methods	Overall Purpose	Advantages	Challenges
Interviews	To explore in depth, or to understand someone's impressions, feelings or interest as well as their responses.	• Provides full range and depth of information • High item-response rate • Allows for question clarification	• Time-consuming to do and to analyze information • Can be costly • Potential for giving socially acceptable responses
Focus Groups	To explore a topic in depth through group discussion; to gain information that will help focus program planning, evaluation or needed research.	• Quick way to obtain a range and depth of information • Inexpensive • Allows leader to convey information about a program	• Requires good facilitation • Guarding against generalizing to a population • Preventing participants from influencing each other
Questionnaires and mail surveys	To quickly obtain information from many people in a non-threatening way.	• Can administer to many people • Can obtain lots of data • Can ensure anonymity • Straightforward to compare and analyze	• Might not get thoughtful feedback • Potential nonresponse bias • May need sampling expertise • No opportunity for clarification • Doesn't yield full story • Lower response rate for mail surveys
Observation	To gather information about actual operations, processes or events.	• Viewing in real time • Allows insights into context • Allows evaluator to verify information gained from other methods	• Observations can be difficult to categorize and interpret • Can influence participant's behaviors when being observed • Labour-intensive

Methods	Overall Purpose	Advantages	Challenges
Case Studies	To understand program experiences in their context and environment; to explore cases in depth; to compare and to find commonalities.	• Allows in-depth understanding, including the context • Comparisons help identify strengths, weaknesses • Explores diversity while revealing commonalities	• Can be time-consuming and costly • Scope is not broad because of limited number of cases • Criteria for case selection needed
Literature, Document or Product Review	To gather information on the program, audience or issue and to identify what previous investigations have found.	• Makes use of information already gathered • Provides evidence about the problem • Can reveal changes over time • Minimum effort or interruption of audience	• Data restricted to what already exists; may not address target questions • Data synthesis can be difficult • Criteria needed for selecting sources of information • Validity and reliability of internet and social media
Tests	To determine the audience's current state of knowledge, preferences, feelings, opinions or skill regarding the topic; to reveal changes as a result of the program.	• Helps identify proficiency/deficiency as compared to a standard • Results easily quantified • Easy to compare performances • Multiple testing can measure change	• Can be intimidating or cause worry about how results will be used • Language or vocabulary can be an issue • Some people do not test well

(Adapted from National Oceanic and Atmospheric Administration 2004, McNamara n.d.)

Examples of data collection tools used in stewardship programs

The following examples describe some of the most common data collection tools in use among stewardship programs in the Atlantic Region.

Questionnaires and surveys

The following is the beginning section only of a wolffish stewardship questionnaire administered orally and in-person by Intervale staff at ports across Newfoundland and Labrador from 2004 to 2009. Harvesters were asked questions about their knowledge, opinions and actions so as to track the progress of a stewardship program. The survey was repeated each year.

EVALUATION QUESTIONNAIRE

Interview number _____ Date_____ Fishery_____
Location (community)_____ Interviewer_____ -

Reminders for the introduction: Introduce yourself and who you work for. State that Intervale is small nonprofit organization in NL dedicated to community participation in fish and wildlife stewardship. Explain that you are evaluating current efforts to reduce wolffish mortality due to by-catch. Respondents will remain anonymous. Be sure to obtain permission before asking the questions. Using the large colour photographs, ask questions in the order that is comfortable for the harvester.

Section 1. Level of experience with wolffish.

1.1 Have you or other fish harvesters in your area caught any of these fish as bycatch (accidental catch) during this season? Yes___ No___
1.2 In recent past years? Yes___ No___
1.3 Which ones? (Check appropriate ones)
a) Northern wolffish ___ Local names _____
b) Spotted wolffish ___ Local names _____
c) Striped wolffish ___ Local names _____
1 .4a Can you tell me where? _____
1 .4b How deep was the water? _____fathoms (Use the boxes to enter any details offered.)

Northern	Spotted	Striped	Undifferentiated

1.5 Using what kind of gear? _____

Northern	Spotted	Striped	Undifferentiated

1.6 What directed species were you fishing when you caught wolffish?_____

Northern	Spotted	Striped	Undifferentiated

.....questionnaire is continued.
(Source: Intervale. For further information, contact info@intervale.ca).

Using Tests of Knowledge

A pre and post test of knowledge was administered to elementary schools students in beach communities of Nova Scotia before and after receiving classroom instruction by a stewardship biologist about the endangered Piping Plover. The purpose was to assess what students learn in a relatively short time and the value of using classroom instruction to increase awareness among residents about the presence of Piping Plover in Nova Scotia. The instructor presented slides showing images that matched the numbered responses.

Organizing a presentation to students in schools can be time-consuming these days, but the result carries the possibility that students will share stories about what they learn in the classroom with their parents and friends. This wider impact of in-school programming could also

be measured. If positive results emerged, they would have the potential of strengthening the value of educational strategies for species recovery.

Beaches are Home Presentation – Classroom Survey
Date_____School_____
Grade level_____ Total # students_____ # teachers_____

Before Presentation	Options	# Responses
Question 1 Which bird is a Piping Plover? *(students shown images of four bird species)*	1 Common Tern	
	2 Savannah Sparrow	
	3 Piping Plover	
	4 Sanderling	
Question 2 Where do Piping Plovers hide their nests? *(students shown images of four habitats)*	1. In the thick grass	
	2. On the dry sand	
	3. In the trees	
	4. On the sides of cliffs	
Question 3 How many Piping Plovers are in Nova Scotia? *(students shown images of four numbers)*	1. 1,000	
	2. 500	
	3. 100	
	4. 20	

The same test was administered immediately after the presentation. (Source: Nova Scotia Piping Plover Program, courtesy Sue Abbott, Bird Studies Canada. For information, contact sabbott@bsc-eoc.org)

Another example of tests of knowledge may be found in Appendix F, which illustrates a pre and post test about wolffish for school children. The tests were administered to students in Grades 4 through 7 just prior and after viewing the educational video about wolffish described in Chapter 4. Results led to the decision to include DVD copies of the video among the supplemental curriculum materials distributed by the Newfoundland and Labrador Department of Education for use in conjunction with the province's environmental science curriculum.

Collecting Data through Observation
The following example describes a case study in which data collected by means of observation were used to evaluate the impact of off-road vehicles on nesting Piping Plover.

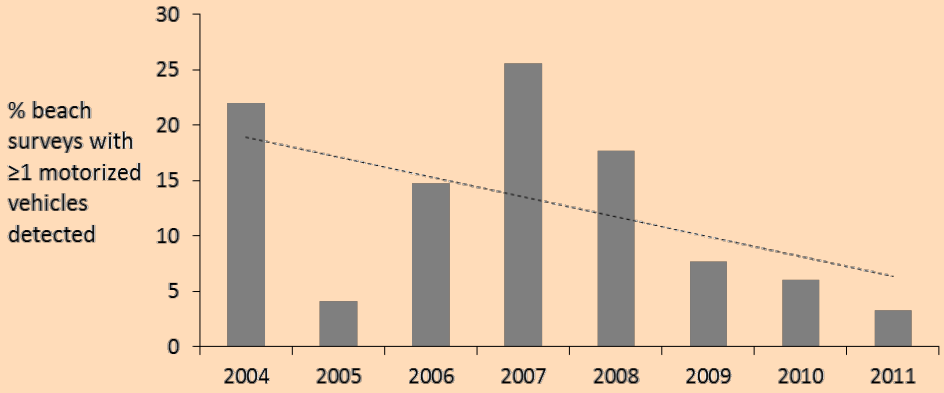
Measuring Threat Reduction Using Observation

Question: Has the threat of off-highway vehicles to Piping Plover and beach habitat in SW NS declined from 2004 to 2011?

Indicator: Annual incidence of motorized vehicles on beaches in SW NS (Shelburne, Queens and Lunenburg counties) during Piping Plover surveys, measured as a percentage of beaches with one or more motorized vehicles or new vehicle tracks detected.

Methods: During regular May-August surveys of beaches to monitor Piping Plovers and conduct stewardship activities in southern NS, Bird Studies Canada program staff and volunteers documented the number of new motorized vehicle tracks and any vehicles observed on the beach, particularly all-terrain vehicles. Additional data had been collected by partner organizations in 2004 and 2005. In most cases, beaches with breeding Piping Plover were surveyed at least once per week and sometimes as many as three times per week. Beaches with no plovers were surveyed less often. For each year, we analyzed the percent of all surveys with one or more new track(s) or vehicle(s) detected. This allowed us to account for differences in effort between years, as there was variability in the number of surveys conducted each year. We conducted a linear regression to show overall declining trend ($R^2 = 0.26$).

Results:



- We detected a decreasing trend of motorized vehicle use between 2004 and 2011.
- For unknown reasons, a spike in motorized vehicles on beaches occurred in 2007, particularly on Cape Sable Island beaches; however, usage has dropped considerably since then.
- A local resident and birder on Cape Sable Island remarked in April 2012 that he has noted a considerable drop in off-highway vehicles on Daniels Head, one of the beaches that has experienced chronic vehicle usage.

Assessment: The province of Nova Scotia passed amendments to the Off-highway Vehicle Act (OHV Act) in 2005 that made it illegal to drive a motorized vehicle without a permit on many beaches and this, no doubt, influenced the decreasing trend we have documented. We believe, however, that our stewardship efforts have played a key role in reducing vehicle use to low levels. Data collection has allowed us to track vehicle usage, assess problem areas and provide valuable information to conservation enforcement officers, who then were able to take action. Communication and collaboration with enforcement has been pivotal in helping reduce motorized vehicle use on beaches. We meet with provincial conservation officers in all regions at least once a year to present results and discuss planning, we provide regular updates on status of Piping Plovers throughout the breeding season and we report all vehicle incidents to appropriate officer(s) as soon as possible. Our spring planning meetings have brought together federal and provincial officers, which has resulted in joint operations in southern Nova Scotia. (Case study contributed by Sue Abbott, Bird Studies Canada. For information or permission to cite, contact Sue Abbott sabbott@bsc-eoc.org)

Choosing Data Collection Tools: Resources for Further Study

For practitioners who seek a quick description of data collection tools useful for environmental education projects, we recommend the workbook by Ernst et al. (2009) listed in the Suggested Resources section. For in-depth instruction in the use and analysis of surveys and questionnaires, with real-life examples from wildlife and recreation management, we recommend a textbook by Jerry Vaske (2008). Practitioners who prefer a shorter explanation of surveys may wish to consult web-based resources, a few of which appear in the Suggested Resources section.

Further Learning: Try to map out a plan for an evaluation of a stewardship program with which you are familiar. If you are not yet comfortable planning an evaluation, discuss your questions with other practitioners and researchers.

Lessons Learned:

- Planning an evaluation involves focusing on the purpose, questions, indicators and data collection tools.
- There are many resources on how to develop data collection tools that can be applied to stewardship programs.
- Program staff and volunteers can play an active role in data collection.
- When planning a survey or set of interviews, select the method that will yield the most valid and reliable information, factoring in such things as culture, language, word choice and question comprehension. Residents of rural communities often respond better to in-person interviews than mail-out questionnaires.

Chapter 6. Using Evaluation to Improve Programs and Demonstrate Results

"They need to understand why they are being asked to change their behaviour, and contact needs to be maintained so they can see the results of their involvement."

Stewardship program manager

In this chapter, we present examples of how stewardship programs are making use of data gathering, scientific analysis and evaluation to improve program effectiveness, demonstrate results and communicate to key stakeholder groups. The examples illustrate a variety of species, habitats and methodologies. In some cases, outside researchers performed the data gathering and analysis.

Before we present several examples, we want to discuss the importance of reporting to stakeholders the results of our findings. With all the energy that goes into organizing and implementing an evaluation, it is easy to put off reporting the results of that evaluation to the key stakeholder groups whose actions and opinions can influence recovery. However, part of our mission as stewards is to convey information about what works to the people who can make a difference, particularly stakeholder groups who might not otherwise have easy access to that information.

Key Point: Use the findings from evaluation to demonstrate to stakeholders and other key groups the results of their stewardship efforts. Show appreciation for what they have helped to accomplish, share the credit and emphasize the benefits.

A powerful example of the importance of reporting to stakeholder groups comes from a stewardship program targeted to mariners in the Bay of Fundy region, where biologists are conveying the results of scientific research about how to prevent harmful ship strikes to whales, especially the endangered right whale. The combined efforts of all groups involved are producing results: reduction in the risk of lethal vessel-encounters with whales, minimal disruption to vessel operations and the maintenance of safe navigation.

Communicating Results to Stakeholders Builds Positive Relationships

There are only about 450 North Atlantic right whales remaining. Two conservation measures and a mariner awareness program have substantially reduced the risk of vessel strikes of right whales in their summer and autumn feeding habitats in the waters of Atlantic Canada. Previously, right whale areas overlapped with mandatory shipping lanes in the Bay of Fundy and with vessel traffic south of Nova Scotia. Moira Brown, researcher with the Canadian Whale Institute, found that a key strategy to an effective stewardship program is communicating to vessel operators the results of data analysis that demonstrate both reduced risk of lethal collisions and fewer vessel strikes with endangered right whales. Industry stakeholder groups have been complying with amended shipping lanes since 2003 and voluntarily avoiding a critical habitat known as the Roseway Basin Area to be Avoided (ATBA) since 2008. Both measures were adopted by the International Maritime Organization and implemented by Transport Canada.

This relationship evolved, not by a regulatory process, but through repeated efforts to communicate the results of good science through in-person interactions that build positive relationships. An awareness campaign, which began in 1992, engaged industry and government representatives as well as professional mariners such as harbour pilots, shipping agents and offshore tanker captains. Reduced risk of vessel collisions with right whales was demonstrated convincingly by researchers Christopher Taggart and Angelia Vanderlaan at Dalhousie University, who monitored vessel traffic south of Nova Scotia before and after the ATBA was instituted (Vanderlaan et al. 2008). Moira Brown then communicated these results to the stakeholder groups as part of a Marine Steward Recognition Programme, which congratulates vessel operators for their actions in avoiding the area. This positive feedback also serves to encourage other vessel operators to join in the recovery effort. (Information contributed by Moira Brown. Contact: moira.brown@canadianwhales.org.)

Evaluating Stewardship Agreements for the Limestone Barrens

A formative evaluation conducted by the Limestone Barrens Habitat Stewardship Program illustrates a focused approach to assessing progress according to standards represented by the terms of a stewardship agreement between the Province of Newfoundland and Labrador and a municipality. Using an interview approach, which could be accomplished in a single season, the evaluator verified the status of outputs and outcomes of a program that is leading logically to the conservation objectives of preserving habitat for species at risk and engaging local residents in stewardship.

We present a portion of the evaluation that was conducted for the stewardship agreement involving the province and a municipality, which has been given the fictitious name of Tinker Harbour. The following represents the first section of a data sheet that addressed seven aspects of the agreement. The text has been edited to conserve space.

Table 13. First section of an evaluation of a Stewardship Agreement between the Province of Newfoundland and Labrador and the Town of Tinker Harbour
(Source: Limestone Barrens Habitat Stewardship Program, courtesy Dulcie House. For information, contact lbhsp@nf.sympatico.ca)

Agreement Requirements	Task List	Objective Evidence	Finding or Recommendations
1. "The lands...shall be set aside, preserved and managed in accordance with the terms and conditions of this Agreement..."	Interview with Town representative. *Ask if designated stewardship zone has been marked by signage. -if yes, verify on site *Verify if a conservation plan has been developed. -if yes, identify who developed the plan. *Ask if stewardship zone has been considered when planning any development. -if yes, what steps have been taken to ensure conservation of the habitat?	Town secretary was interviewed. Local residents, tourists, and summer work students were informed about the designated area. The zone has not been marked by signage. A formal Conservation Plan has not been developed but the town is willing to help biologists prepare the plan. The Stewardship Zone has been considered when planning any development.	Recommendations included: 1. Limestone Barrens Management Units should be marked with signage. 2. Efforts should be made to develop a formal Conservation Plan. 3. The Town should identify Management Units as protected areas in its Municipal Plan. 4. On-site verification should be ongoing. 5. The stewardship program should continue and is vital to ensure recovery of Species at Risk in the target area.

Once data were gathered and analyzed, the recovery team formulated a set of recommendations that served as useful program guidance in moving the program forward. Stewardship agreements continue to serve as powerful tools for encouraging in communities a sense of ownership for local conservation.

Evaluating Efforts to Reduce Human Disturbance to Piping Plover

An evaluation based on data collected from yearly observations over the period of a decade is creating a powerful case for the effectiveness of a long term stewardship program for the endangered Piping Plover in Nova Scotia. While data over several years are showing a decline in nest failures due to human disturbance, program organizers and Recovery Team representatives are pointing to the highly effective messaging conveyed by volunteers and special beach signs, which are influencing beach users to adopt specific conservation behaviours. The program is achieving its stewardship objectives of reducing threats to breeding Piping Plover in Nova Scotia and increasing understanding among beachgoers about Piping Plovers and beach ecology. These achievements must be maintained year to year, with ongoing support, in order for the long term goal of Piping Plover recovery to be reached.

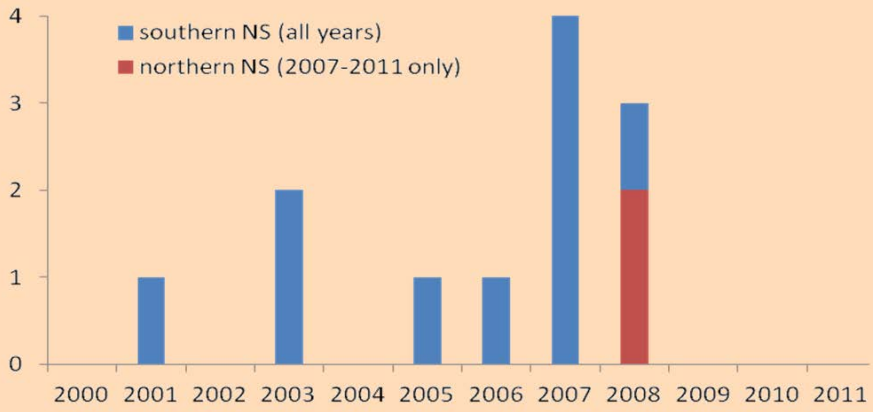
Measuring human-caused nest failures for breeding Piping Plover in Nova Scotia

Question: Has the number of nest failures for Piping Plover in Nova Scotia caused by human disturbance declined over the past several years?

Indicator: Number of nests of known fate lost due to human-caused events during 2001-2011.

Methods: Permitted program staff, partners and volunteers located and monitored Piping Plover nests on a regular basis to determine the fate of Piping Plover nests as a measure of breeding success. Nest fate determination was made based on knowledge of the expected hatch date and evidence at the nest site, e.g., disappearance of eggs before the expected hatch date is determined to be a failed nest. The cause of nest failure was documented only when there was clear evidence at or around the nest site. On sandy beaches, blowing wind quickly affects evidence, such as predator tracks, and, therefore, many causes of failure are unknown.

The staff analyzed nest fate data for southern Nova Scotia during 2000-2011 and northern Nova Scotia during 2007-2011. They characterized the causes of human-caused nest loss into two categories: 1) vandalism of signs, fencing and/or predator exclosure; human intrusion into symbolic fencing (rope and signs) protecting the nesting area; or human presence at nest site; and 2) destruction of eggs due to foot or vehicle traffic.



Annual number of known Piping Plover nests lost due to human-related causes.

Results:

- No nest failures due to human-related causes in the three years, 2009-2011.
- A total of 12 nests were lost due to human-related causes since 2000, which represents a small fraction of total nests lost.
- The loss of one or more nests in half of all years examined were due to human caused disturbance.
- Using past reports from partners, they characterized 11 out of 12 cases of human-caused nest loss. Disturbance-related nest loss accounted for eight cases, of which six were events of vandalism or intrusion into symbolic fencing. Six cases involved all-terrain vehicles, trucks or bicycles.

Assessment: The Nova Scotia Piping Plover Program staff believe that the resulting absence of human-caused nest failure over the past three years is due in part to improved communication efforts and promoting positive messages to beach-goers about what they can do to help, in particular, by walking on wet sand as opposed to dry sand in areas of Piping Plover nesting.

They believe that the message of the graphic used on signs has increased understanding among beach users as to how they can reduce disturbance to Piping Plovers. They also believe that the messaging has created a more positive environment on the beach, as opposed to the imprecise, negative message, "stay away from nests," that had been portrayed by more traditional program signs. On some beaches where program team members have observed noticeable improvements in the behaviour of beach users, they have been able to reduce the amount of symbolic fencing, i.e. rope and signs, used to protect habitat. (This case study was contributed by Sue Abbott, Nova Scotia Piping Plover Program, Bird Studies Canada. For information or permission to cite, contact sabbott@bsc-eoc.org)

Background to the case study: In 2006, the Nova Scotia Piping Plover program collaborated with an illustrator to develop a graphic that would convey the simple message, "walk on wet sand," to beach users, in order to prevent disturbance to breeding Piping Plovers. The idea came about after years of field work by staff and volunteers, observing beach users and encouraging them to walk low on the beach towards the water's edge and distant from nests that are on dry sand. The graphic was used effectively in a stewardship guide about beaches and dunes for landowners (Abbott 2009).

Trial runs of the illustration proved so effective that the graphic was modified (Figure 7) and a final version is being adopted by the Canadian Wildlife Service for use at several beaches in the Atlantic Region.

Figure 7. Illustration for a sign promoting best practices for beach users in Piping Plover nesting areas (Source: Nova Scotia Piping Plover Program, Bird Studies Canada and Canadian Wildlife Service. Courtesy Sue Abbott. For information, contact sabbott@bsc-eoc.org)

Using Outside Evaluators to Audit Municipal Wetland Stewardship

In 2003, the Eastern Habitat Joint Venture (EHJV) contracted a team from Intervale to conduct the first audit of the Municipal Wetlands Stewardship program in Newfoundland and Labrador. A core initiative of the EHJV in that province, the program had been in operation since 1993 and had expanded to eleven communities by the time of the audit. Through a municipal stewardship agreement with the province, municipalities agreed to protect and manage specific wetland habitats located within their municipal boundaries. The provincial office of the EHJV, in turn, provided towns with technical advice, resource inventories and a management plan.

The audit's purpose was to evaluate how the program had progressed in meeting its three goals: 1) to protect and enhance local wetland habitat; 2) to protect and enhance waterfowl populations; and 3) to encourage appreciation and sense of responsibility towards wetlands.

The researchers used a mixed methods approach, gathering data in each community using four distinct methods: 1) interviews with key informants; 2) a clipboard survey of town residents, who were intercepted at shopping plazas and other gathering places; 3) field observations at the wetlands; and 4) visits to town offices to verify the presence of a stewardship agreement. They analyzed these data to identify possible links between activities and outcomes relevant to the program's three goals. Findings from the clipboard survey of 116 citizens, for instance, showed a very high percentage (97%) supported the stewardship agreement but many fewer (37%) had participated in activities of the stewardship program. Nearly everyone who participated in the in-depth interviews was positive about the program's progress, while field observations identified a few areas needing more attention.

The evaluators concluded that the Municipal Wetlands Stewardship program had made substantial progress toward each of the program's three main goals and that it showed promise of additional accomplishments as the program continued to expand and mature. They also identified secondary outcomes that were indirectly benefiting waterfowl, wetlands and conservation generally. They recommended where the program could be strengthened, citing for example the role of the Stewardship Association of Municipalities, funding for the EHJV staff in Newfoundland and Labrador and technical training opportunities for local leaders. Finally, the evaluators concluded that Municipal Wetlands Stewardship is an effective strategy for conservation and that it should be given strong support. Since the time of the audit, the program has expanded to 28 municipalities and is considered a successful initiative. (Source: Intervale 2003. For information, contact jonathansharpe@gov.nl.ca or kblanchard@intervale.ca)

Evaluating Long-Term Changes in Knowledge, Attitudes and Hunting Practices

Along the North Shore of the Gulf of St. Lawrence, seabirds were harvested traditionally for food. Illegal hunting and disturbance of seabirds breeding on federal Migratory Bird Sanctuaries caused severe population declines for several species between 1955 and 1978. A collaborative effort led by the nonprofit Quebec-Labrador Foundation (described in Chapter 2) addressed the issue with front-end research, gathering human dimensions data about the traditional harvest as well as local knowledge, attitudes, values and hunting behaviour. In 1981, program staff members conducted a survey of heads of households in seven communities spread over 400 km and used the baseline data to inform the planning process for a comprehensive program. After the program ran for seven years, they repeated the household survey and compared the results, which showed statistically significant changes in local knowledge, attitudes and hunting practices, as demonstrated in the sample results shown in Tables 14 and 15.

Table 14. Change in knowledge of wildlife law in percentage of heads-of-households stating correctly the legal status of certain selected marine bird species along the Quebec Lower North Shore between 1981 and 1988

(Source: Blanchard 1994)

	1981 (n=140)	1988 (n=145)	χ^2	Significance level
Common Eider	**80.7**	**87.6**	**2.92**	**n.s.**
Herring Gull	**78.6**	**79.3**	**9.35**	**<0.01**
Razorbill	**62.1**	**70.3**	**22.90**	**<0.001**
Common Murre	**47.1**	**64.1**	**26.30**	**<0.001**
Atlantic Puffin	**70.7**	**76.5**	**16.00**	**<0.001**

Table 15. Change in attitudes about wildlife laws as shown in the percentage of heads-of-households who believed that hunting should be allowed for certain selected marine bird species along the Quebec Lower North Shore between 1981 and 1988
(Source: Blanchard 1994)

	1981 (n=140)	1988 (n=145)	χ^2	Significance level
Common Eider	**91.4**	**91.0**	**2.58**	**n.s.**
Herring Gull	**46.4**	**33.1**	**7.17**	**0.027**
Razorbill	**58.6**	**37.9**	**12.53**	**0.002**
Common Murre	**76.4**	**64.8**	**6.56**	**0.038**
Atlantic Puffin	**54.3**	**26.9**	**22.22**	**<0.001**

By 1988, the program's three objectives had been achieved: an increased population of seabirds breeding in sanctuaries; sustained improvement in local knowledge, attitudes and behaviour towards seabirds; and greater local support for, and involvement in, the management process.

The stewardship program and an analysis of the survey results were reported in the scientific and popular literature, as seabird biologists acknowledged the role that the stewardship program played in promoting conservation behaviour and that the resulting decrease in human disturbance led to an increase in productivity for species nesting on the sanctuaries. Meanwhile, breeding bird census results taken by Canadian Wildlife Service biologists on the sanctuaries demonstrated noteworthy increases for several species.

Using Evaluation to Measure Landowner Engagement in Piping Plover Recovery

Recovery programs increasingly rely upon volunteer engagement but recruiting and maintaining volunteers is both challenging and time-consuming. The Nova Scotia Piping Plover program has measured the engagement and year-to-year commitment of community and landowner volunteers of that program since 2006. The methodology and results of the evaluation are described in Appendix G.

Further Learning: What examples of stewardship program evaluations can you describe, which might be useful as a learning tool for the community of practitioners? How was the evaluation organized, what were the results and how was it reported out?

Lessons Learned:

- The benefits of evaluation are better realized when the results are shared, especially when people learn how their efforts are contributing positively to the conservation objectives.
- There is mounting evidence that stewardship is making a difference as an effective strategy for conservation and recovery.

Chapter 7. Evaluation Is Integral to the Practice of Stewardship

> "An important indicator, from my perspective, is how the people themselves are beginning to initiate projects. . . . They are making stewardship part of their everyday actions."
>
> *Scientist and recovery team member*

Most of us believe that stewardship produces results. That said, people are asking, "Can we prove it?" We cannot afford to ignore this question nor to be intimidated by it. We just need to get better at demonstrating how our programs contribute to the conservation objectives. As we have seen in the examples presented in this handbook, many programs in the Atlantic Region already are demonstrating good results for species recovery.

All of us are under a lot of pressure to find needed funding and deliver program results within a short time frame. It would be easy to reduce our programs to consist merely of planning and implementation, without the solid foundation of front-end research or the benefit of reflection based on evaluation. As we have seen, evaluation can be performed during ***any*** phase of the program cycle. It all depends on the questions we are asking. Outcomes evaluation may be focused on the high stakes question, "Did it work?" but there are many other equally important questions. At any phase of the program cycle, we can ask ourselves, "What are we learning?" Our confidence grows as we improve program performance by making evaluation and learning an integral part of all aspects of our program.

Recalling the model for a typical program cycle that was presented in Chapter 1 of this handbook, integrating evaluation into all phases of a program cycle allows for feedback, constructive decision-making and modifications to future work. Here are some general recommendations, organized according to the phases of a program cycle.

Initial phase (Preliminary Research)
Create strong partnerships from the beginning, shaping the program so that the people whose livelihoods depend on the species or habitat will benefit from the initiative, buy into it and work to keep it going long term. Pay attention to the cultural context. Develop a shared goal and set of objectives. Conduct preliminary research or front-end evaluation in order to create a baseline of data on the species, habitat or characteristics of a group of people and to inform program planning. Identify barriers to change and root causes of a problem, if known.

Planning
Develop a program plan, flow chart or logic model showing program inputs, outputs and outcomes. Show how the components are linked and how they lead progressively to the conservation outcome or objective. Identifying meaningful, measurable outcomes is more difficult than enumerating program outputs, but the outcomes will be better predictors of conservation success. Check your assumptions. Engage partners and stakeholder groups so as to cultivate a sense of ownership and pride.

Implementation
Implement the program using an adaptive management approach, modifying the program as needed based on feedback and on results of formative evaluation. Select the most appropriate activities, not necessarily those most familiar, take a positive approach and keep stakeholders engaged.

Reflection and assessment
Depending on the duration of the program and its prospects for continuing, measure short (1-2 years) or medium (2-4 years) term outcomes. If a baseline of data exists, measure the change that has occurred. Assess the degree to which the program has achieved its intended outcomes or objectives. Report out to the constituencies on the progress being made. Share the credit.

Key ingredients of effective stewardship programs for the recovery of species at risk include:

- an investigation of the issue and its context, which focuses not only on the species or habitat but also the people;
- the integration of the program into the overall management or recovery plan;
- collaboration with relevant partners, stakeholders and constituents;
- engagement activities that build trust and a sense of ownership;
- leadership and capacity building for program beneficiaries such as local residents; and
- evaluation from beginning to end.

Further Learning: What other ingredients would you add to the above list?

Key Point: Given the accelerated rate of population declines for many species and the growing complexity of issues, we must share the lessons we have learned with each other, pass them along to the next generation and, above all, continue to introduce people to the wonders of nature.

Lessons Learned:

- Evaluation is key to improved programming. It keeps us focused on the conservation objectives. It helps us demonstrate program results.
- Stewardship's role in conservation and recovery will continue to gain momentum as we use evaluation to improve our programs, report our results to all concerned and share the lessons learned.

Suggested Resources

There are many books and web sites that contain practical information about how to conduct an evaluation. We list the references cited in this handbook plus additional resources that may be helpful in planning an evaluation.

Instruction on Outcomes-based Planning and Program Evaluation

Bennett, C.1975. Up the hierarchy. *Journal of Extension*, March/April, 7-12. Retrieved from http://www.joe.org/joe/1975march/1975-2-a1.pdf

EMI (Ecosystem Management Initiative). 2004. Measuring Progress: An Evaluation Guide for Ecosystem and Community-Based Projects. School of Natural Resources and Environment, Univ. of Michigan. www.snre.umich.edu/ecomgt/evaluation/templates.htm

Ernst, J., Monroe, M. and Simmons, B. 2009. Evaluating your environmental education programs: A workbook for practitioners. North American Association for Environmental Education. Washington, DC. 172 pp. *(Note: Very helpful workbook.)*

Foundations of Success. 2007. Using results chains to improve strategy effectiveness: An FOS How-To Guide Retrieved from http://www.fosonline.org/wordpress/wp-content/uploads/2010/09/FOS_Results_Chain_Guide_2007-05.pdf

McNamara, C. n.d. Basic guide to program evaluation. Free Management Library. http://managementhelp.org/evaluation/program-evaluation-guide.htm

MEERA: My Environmental Education Evaluation Resource Assistant. http://meera.snre.umich.edu/

National Oceanographic and Atmospheric Administration. 2004. Designing evaluation for education projects. Washington DC. Downloadable PDF available at http://meera.snre.umich.edu/plan-an-evaluation/evaluation-what-it-and-why-do-it#what

Thomson, G. and Hoffman, J. 2003. Measuring the success of EE programs. Canadian Parks and Wilderness Society. Retrieved from http://www.peecworks.org/PEEC/PEEC_Research/S0009D4C9-0009D4CA

Taylor-Powell, E. and Henert, E. 2008. Developing a logic model: teaching and training guide. University of Wisconsin-Extension, Cooperative Extension. Madison, WI. Downloadable from the UW-Extension Program Development and Evaluation Web site, http://www.uwex.edu/ces/pdande/evaluation/pdf/lmguidecomplete.pdf.

United Way of America. 1996. Measuring program outcomes: A practical approach. United Way of America. 170 pp. *Available through the United Way Store*, Product number 0989. http://www.unitedwaystore.com/

University of Wisconsin-Extension, Cooperative Extension. (*Note: several handbooks.*) http://learningstore.uwex.edu/Program-Development-Evaluation-C234.aspx

Applications to Conservation and Recovery

Blanchard, K. 2010. Impact of stewardship on the recovery of species at risk: A case study approach. Report Summary. Intervale Associates Inc., Doyles, NL. 10 pp.

Conservation Measures Partnership. 2007. Open standards for the practice of conservation. Retrieved from http://www.conservationmeasures.org/wp-content/uploads/2010/04/CMP_Open_Standards_Version_2.0.pdf

Intervale Associates. 2003. Municipal Wetland Stewardship: Audit 2003. Intervale Conservation and Heritage Associates Inc., Doyles, NL. 150 pp.

Jacobson, S.K. (editor). 1995. Conserving wildlife: International education and communication approaches. Columbia University Press, New York. 302 pp.

Mackenzie-Mohr, D. 2010. Fostering sustainable behavior: Community-based social marketing. Retrieved from http://www.cbsm.com/public/world.lasso

Mackenzie-Mohr, D. and Smith, W. 1999. Fostering sustainable behavior: an introduction to community-based social marketing. New Society Pub., Gabriola Island, BC. 160 pp.

Monroe, M.C. 2003. Two avenues for encouraging conservation behaviors. Human Ecology Review 10 (2) 113-125.

Vaske, J. J. 2008. Survey research and analysis: Application in parks, recreation and human dimensions. Venture Publishing, State College, PA. 635 pp.

Additional References

Abbott, S. 2009. Healthy beaches and dunes for tomorrow: a stewardship guide for Nova Scotia landowners. Bird Studies Canada, Port Rowan, ON. 24 pp. http://www.birdscanada.org/volunteer/nsplover/NSHealthyBeaches.pdf

Blanchard, K.A. 1987. Strategies for the conservation of seabirds on Quebec's North Shore and geese on Alaska's Yukon-Kuskokwim Delta: a comparison. Trans. N. Amer. Wildl. & Natur. Resour. Conference 52: 399-407.

Blanchard, K.A. 1995. Seabird conservation on the North Shore of the Gulf of St. Lawrence, Canada: The effects of education on attitudes and behavior towards a marine resource. Pp. 39-50. In: J. Palmer, W. Goldstein and A. Curnow, eds. Planning Education to Care for the Earth. IUCN, Gland, CH and Cambridge, UK. 169 pp. http://intranet.iucn.org/webfiles/doc/CEC/Public/Electronic/CEC/Books/PlanningEducation.pdf.

Blanchard, K.A. 1994. Culture and seabird conservation: the North Shore of the Gulf of St. Lawrence, Canada. Pp. 294-310. In: D.N Nettleship, J. Burger and M. Gochfeld, eds. Seabirds on Islands: Threats, Case Studies and Action Plans. BirdLife International, Monograph Series, No. 1, Cambridge, U.K.

Blanchard, K.A. and Nettleship, D.N. 1992. Education and seabird conservation: a conceptual framework. Pp. 616-632. In: D.R. McCullough & R.H. Barrett, eds. Wildlife 2001: Populations. Elsevier Applied Science, London, U.K.

Blanchard, K. A. and Monroe, M.C. 1990. Effective educational strategies for reversing population declines in seabirds. Trans. N. Amer. Wildl. and Natur. Resour. Conf. 55: 108-117.

Davidson, E.J. 2005. Evaluation Methodology Basics. Sage Publications, Thousand Oaks, California. 263 pp.

Decker, D.J, Brown, T.L. and Siemer, W.F. 2001 (eds.). Human dimensions of wildlife management in North America. The Wildlife Society, Bethesda, Maryland. 446 pp.

Ferraro, P.J. and Pattanayak, S. K. 2006. Money for nothing? A call for empirical evaluation of biodiversity conservation investments. PLoS Biol 4(4), e105.

Kapos, V., Balmford, A., Aveling, R., Bubb, P., Carey, P., Entwistle, A. and Manica, A. 2009. Outcomes, not implementation, predict conservation success. Fauna & Flora International, 43(3), 336-342.

Kapos, V., Balmford, A., Aveling, R., Bubb, P., Carey, P., Entwistle, A. and Manica, A. 2008. Calibrating conservation: new tools for measuring success. Conservation Letters, 1(2008), 155-164.

Kulka, D., Hood, C. and Huntington, J. 2008. Recovery Strategy for Northern Wolffish (Anarhichas denticulatus) and Spotted Wolffish (Anarhichas minor), and Management Plan for Atlantic Wolffish (Anarhichas lupus) in Canada. Fisheries and Oceans Canada: Newfoundland and Labrador Region. St. John's, NL. x + 103 pp.

Manfredo, M.J., Teel, T.L. and Bright, A.D. 2004. Applications of the concepts of values and attitudes in human dimensions of natural resource research. Pp. 271-282. In: M.J. Manfredo, J.J. Vaske, B.L. Bruyere, D.R. Field and P. Brown, eds. Society and natural resources: A summary of knowledge. Jefferson, MO: Modern Litho.

Patton, M.Q. 1997. Utilization-focused evaluation. 3rd ed. Thousand Oaks, California.

Pomerantz, G.A. and Blanchard, K.A. 1992. Effective communication and education strategies for wildlife conservation. Trans. N. Amer. Wildl. and Natur. Resour. Conf. 57: 156-163.

Stem, C., Margoluis, R., Salafsky, N. and Brown, M. 2005. Monitoring and evaluation in conservation: a review of trends and approaches. Conservation Biology, 19(2), 295-309.

Vanderlaan, A.S.M., Taggart, C.T., Serdynska, A.R., Kenney, R.D. and Brown, M.W. 2008. Reducing the risk of lethal encounters: vessels and right whales in the Bay of Fundy an on the Scotian Shelf. Endangered Species Research 4, 283-297.

Weiss, C.H. 1998. Evaluation, 2nd edit. Prentice Hall, NJ. 372 pp.

Appendix A. Glossary of Selected Terms

SITUATION
The originating problem, or issue, set within a complex of socio-political, environmental and economic circumstances. The situation is the beginning point of logic model development.

INPUTS
What goes into the program: resources and contributions that are invested. Inputs include such elements as staff, money, time, equipment, partnerships and the research base

OUTPUTS
What we do and whom we reach: activities, services, events, products and the people reached. Outputs include such elements as workshops, conferences, counseling, products produced *and* the individuals, clients, groups, families and organizations targeted to be reached by the activities.

OUTCOMES
What results: the value or changes for individuals, families, groups, agencies, businesses, communities and/or systems. Outcomes include short term benefits such as changes in awareness, knowledge, skills, attitudes, opinions and intent. Outcomes include medium term benefits such as changes in behaviors, decision-making and actions. Outcomes include long-term benefits (often called impact) such as changes in social, economic, civic and environmental conditions.

ASSUMPTIONS
The beliefs we have about: the program, the people involved and how we think the program will work. Assumptions include our ideas about the problem or situation; the way the program will operate; what the program expects to achieve; how the participants learn and behave, their motivations, etc.; the resources and staff; the external environment; the knowledge base; and the internal environment. Faulty assumptions are often the reason for poor results.

EXTERNAL FACTORS
Aspects external to the program that influence the way the program operates, and are influenced by the program. Dynamic systems interactions include the cultural milieu, biophysical environment, economic structure, housing patterns, demographic makeup, family circumstances, values, political environment, background and experiences of participants, media, policies and priorities, etc. Elements that affect the program, over which there is little control.

Source: Taylor-Powell and Henert 2008. Developing a logic model: teaching and training guide. University of Wisconsin-Extension, Cooperative Extension.

Appendix B. Answers to Outputs vs. Outcomes Worksheet

Description	Output	Outcome
There was a 40% increase in the number of trappers using Newfoundland marten hair snagging boxes from 2011 to 2012.		✓
The Fish, Food and Allied Workers held information meetings about the *Species at Risk Act* in four communities of western Newfoundland in 2003.	✓	
During August, 2009, 300 leaflets about Furbish's Lousewort were delivered to homeowners along the Saint John River.	✓	
Within four years since recovery measures were introduced, more than 98% of fish harvesters interviewed in NL stated that they were releasing wolffish live and in the place where they were caught.		✓
By 2015, 500 acres of river frontage along the Miramichi River will be secured under stewardship agreements.[1]	✓	✓
During the 2010 nesting season there was a 50% reduction in people tracks inside symbolic fencing around Piping Plover nests at White Sands Beach as compared with 2009.		✓

Note: [1] A habitat that is secured under a stewardship agreement may be viewed as either outcome or output, depending on local interpretations.

Appendix C. Stewardship Activities and Products in Use in Eastern Canada

Source: Intervale 2010, based on information from 20 stewardship programs in eastern Canada.

Informational
information brochure or pamphlet
interpretive sign, panel, or informational kiosk
temporary or portable exhibit: wall, table top, store front, booth, banner, car, float, cart, boat, blimp, placard
slide show
poster
newsletter: your own or published in others
directional or instructional sign
hands-on display (e.g., samples, artifacts, models)
photo album or scrapbook
guidebook, handbook, best practices book, or instructional DVD
informational placemat
project website, portal
calendar
bookmark or book cover
activity sheet (youth)
fact sheet, tip sheet, flyer, or species checklist
permanent exhibit: wall, diorama, mural, skeleton, taxidermy mount, sculpture, memorial
newspaper article or op-ed piece
radio program, spot or talk show including local radio
TV program or spot including local cable
magazine article
professional journal paper
digital or film video or DVD
cartoon images or strip
Research, Monitoring, & Archive
monitoring program
research program or assisting researchers
guardian program or conservation officer
collecting TEK
survey (e.g., household, exit)
databank: photo, message, other
land and community use survey
mapping: community, nest sites, habitat and atlases
evaluation study
head-starting fish or wildlife
wildlife rehabilitation
Interpretive, observational, & Demonstration
guided walk
campfire talk
storytelling
bird blind, observation point, or underwater viewing
observation of traditional hunting, fishing, or trapping
web cam on nest site or habitat
field workshop or study tour
craft or skill demo
self-guided walk
re-enactment
traditional food sampling or meal
Ceremonial & Special Events

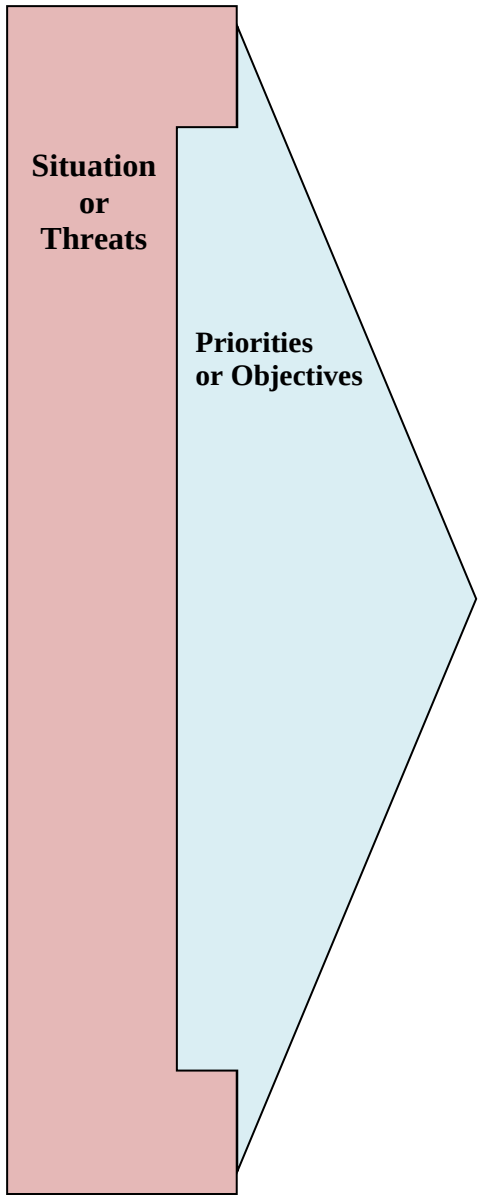
ceremony: recognition or inauguration award, appreciation or retirement
special event: festival, community, school, work, recreational, fundraising (e.g., auction)
rally, walk or bike-a-thon (e.g., ATV)
pow-wow equivalent or AGM
rendezvous
healing or sweat lodge
ritual or religious service
feast
Educational & Interactive Learning
workshop, conference, seminar, panel, think tank, or going door to door, or focus group
in-school presentation
guest lecture
curriculum material or thematic unit
visit or home stay
Naturalists' club or summer camp
on-line learning tool or tool kit
meeting with industry
Language & Visual Arts
art, photography activity, exhibit, or contest
skit, play, song, concert, poem, or story
contests for ideas or solutions
sound effect
Mentoring & Training
volunteer training
youth employment (e.g., Green Team)
youth mentoring, internship or ambassador
aboriginal outfitting and guiding
Prompts & Give-aways
give-away and draw
newspaper/radio appreciation ad or "nastygram"
symbol, logo, or icon
bumper sticker, decal, pin, cresting, t-shirt, cap
postcard reminder or data mail
Commitments
stewardship agreement
conservation plan or site prioritization
environmental pledge
Social Networking
facebook or other social networking

Appendix D. Planning Tool Worksheet
(Adapted from Taylor-Powell and Henert 2008)

Inputs	Outputs		Outcomes		
	Activities	Participation	Short Term	Medium Term	Long Term

Evaluation

Appendix E. Logic Model Worksheet (Adapted from Taylor-Powell and Henert 2008)

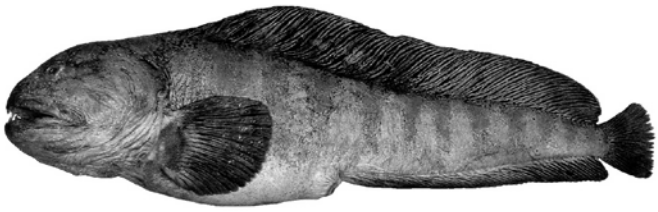


Inputs	Output		Outcomes		
	Activities	*Participants*	*Short Term (1-2yrs)*	*Medium Term (2-3yrs)*	*Long Term (4-10yrs)*
			Proposed		
			Actual		

Appendix F. Pre and Post Test for Student Knowledge of Wolffish

A pre and post test of knowledge and attitudes about wolffish was administered to elementary school students in fishing communities of western and central Newfoundland and southern Labrador. The purpose was to assess short-term changes in knowledge, attitudes, and the value (i.e. importance) of wolffish among Newfoundland and Labrador students in grades 4-6 before and after viewing a 30-minute documentary DVD about wolffish in Newfoundland and Labrador waters. The arrangement of questions differed slightly between the two tests, chiefly for the sake of student interest.

Pre-test



1. Have you ever seen or heard of this fish? Yes____ No____

   If yes, what do people around here call it? _____

2. Do you know what it eats? Name two things: _____

   _____

3. How would you describe this fish? (Circle as many words as you wish)

cute	ugly	shy	aggressive	strong
weak	harmless	dangerous	important	not important
abundant	rare	nuisance	helpful	

   You may add your own words for how you would describe this fish:

   _____

4. Where does this fish live in the sea? (circle all that apply)

near the surface	on coral reefs	in the eel grass
near the bottom	in rock caves	near the wharves

5. Are wolffish important for anything? Yes ___ No ___

   If yes, why are they important? If no, why are they not important?

   _____

   _____

Thank you!

Intervale Associates, Doyles, NL A0N 1J0 info@intervale.ca

****

Post Test

1. Did you learn anything from the DVD? Yes___ No ___ If yes, describe at least one thing that you learned.

   _____

   _____

2. How would you describe the wolffish you saw in the DVD? (Circle as many words as you wish. You may add your own words in the space provided.)

cute	ugly	shy	aggressive	strong
weak	harmless	dangerous	important	not important
abundant	rare	nuisance	helpful	

   Other: _____

3. For each of the following pictures, match the pictures to the name of the fish by writing the letter of the name in the space next to the picture.

_____

A. Northern wolffish

_____

B. Atlantic or striped wolffish

_____

C. Cod

_____ D. Spotted wolffish

4. What is the nesting habitat of the wolffish species you saw on the DVD?

_____

5. Select an item from the list and write it in the space provided to create a food chain involving an Atlantic or striped wolffish.

barnacle	crab	capelin	cod	coral
sea urchin	human being	lobster	squid	

wolffish → _____ → kelp

6. Name at least one other living thing a striped wolffish eats: _____

7. Describe what might happen if wolffish disappeared from the ocean?

_____

_____

8. Which wolffish is more likely to protect the nest and eggs (circle one)

male wolffish female wolffish

9. Do you believe wolffish are important? Yes___ No___ Why?

_____

_____

_____

Thank you!

Intervale Associates, Doyles, NL A0N 1J0 info@intervale.ca

Appendix G. Landowner Engagement for Piping Plover Recovery in Nova Scotia

The following examples of evaluation were contributed by Sue Abbott of Bird Studies Canada, for the Nova Scotia Piping Plover Conservation Program. For information or permission to cite data, contact sabbott@bsc-eoc.org.

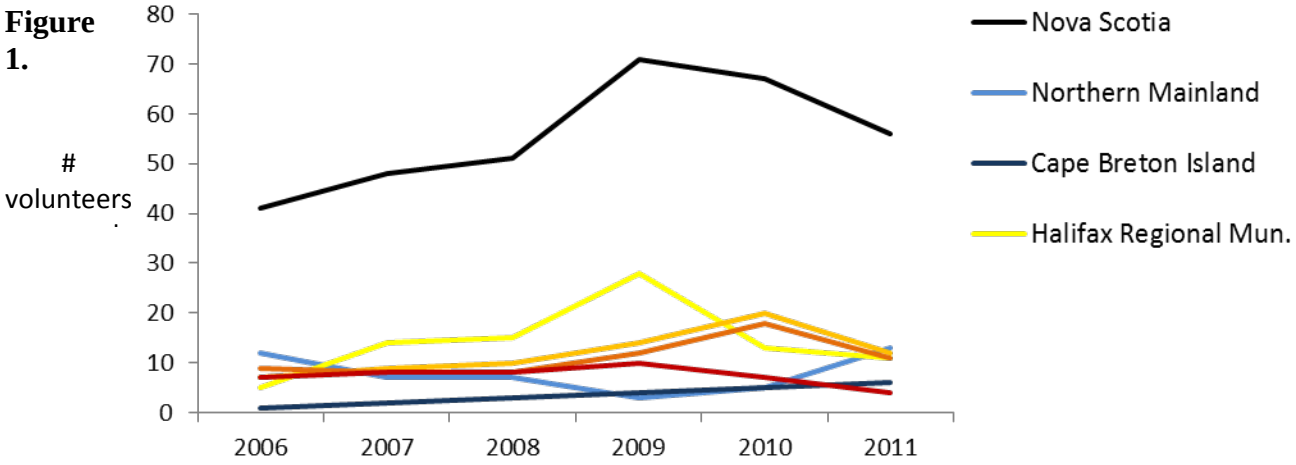
Case Study 1. Evaluating Community member and Landowner Engagement in NS

Approach: Foster local stewardship on beaches occupied by breeding Piping Plovers through targeted engagement of community members and coastal landowners (those who own property within walking distance from beach).

Indicators	Measures
Community member and landowner volunteer engagement by region	Annual number of community members and landowners engaged as volunteers on beaches
Community member and landowner volunteer effort by region	Annual number of volunteer hours contributed by community members and landowners by region
Year to year commitment among community member and landowner volunteers by region	Rate of year to year engagement among community members and landowner volunteers as measured from year of initial engagement to 2011

Indicator: Community members and landowner volunteer engagement by region.
Measure: Annual number of community members and landowners engaged as volunteers on beaches.
Methods: We define engagement as active participation in a stewardship activity associated with Bird Studies Canada's NS Piping Plover Conservation Program. We tracked numbers of volunteers engaged annually since 2006. Volunteer hours were collected in 2008-2011 (hours in 2006 and 2007 were not collected systematically). To assess year to year commitment of volunteers, we excluded volunteers participating in single beach clean-up events.

Figure 1.



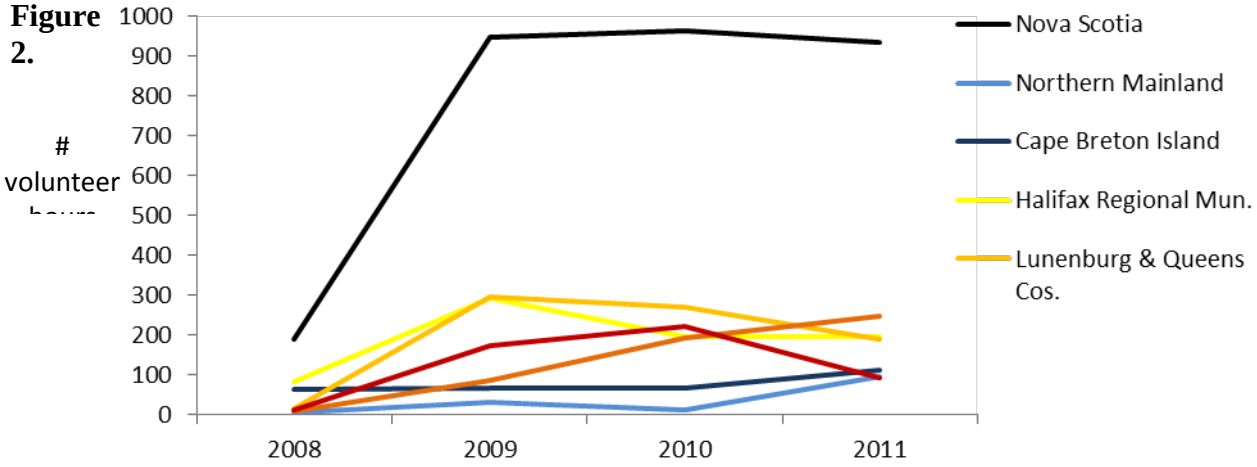
- Level of engagement has increased by 37% since program initiation.
- A total of 162 volunteers were engaged from 2006 to 2011.
- Maximum number of annual volunteers engaged all years was 71 in 2009. This was a year when more Piping Plover bred on Halifax Regional Municipality beaches and, therefore, we recruited a high number of volunteers from urban centres.

- Region with fewest volunteers is Cape Breton Island. Local partnerships have helped build a small team, but progress is limited by lack of capacity and funding to regularly reach communities.
- Western Shelburne Co. has consistently had low numbers of volunteers. Based on conversations with partners, other groups have also experienced challenges recruiting volunteers in this region.

Indicator: Community member and landowner volunteer effort by region.
Measure: Annual number of volunteer hours contributed by community members and landowners by region.

Note: 2006 and 2007 data not collected using standardized method and, therefore, not comparable.

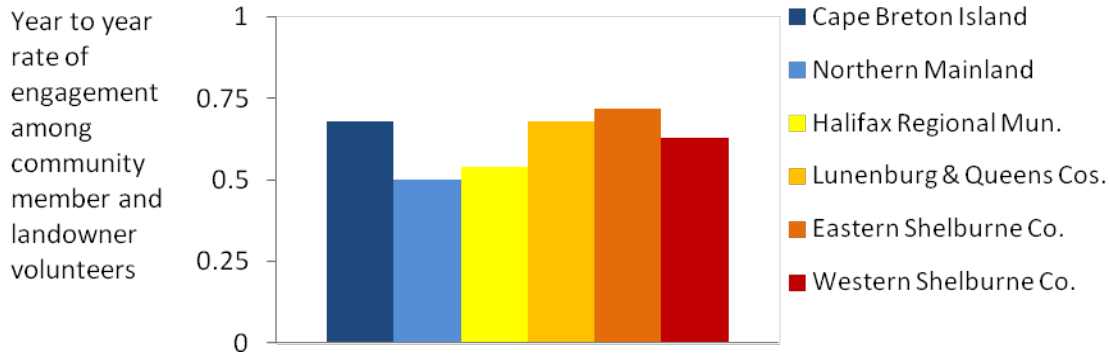
Figure 2.



- Roughly fivefold increase in annual hours province-wide.
- Volunteer effort has increased in all six regions.
- Most significant increase in effort was in E. Shelburne Co. We believe this is due to having a consistent staff person, hired in 2008, who lives in the region and has excellent community contacts.
- Despite a drop in numbers of volunteers in 2010 and 2011 (Figure 1), annual volunteer effort remained steady at over 900 hours. This highlights higher level of engagement among volunteers over past two years.
- Mean total volunteer effort for all years was 21 hrs (n=162 volunteers, max=277 hr, min=1 hr).

Indicator: Year to year commitment among community member and landowner volunteers by region.
Measure: a) Rate of year to year engagement among community members and landowner volunteers as measured from year of initial engagement to 2011.
Methods: To assess year to year 'commitment' of volunteers, we calculated the rate of annual participation for each volunteer starting from the first year they became engaged in the program until 2011. A rate of 1 would indicate a volunteer who participated in all possible years and 0.5 a

volunteer engaged half of all possible years. We excluded volunteers engaged for the first time in 2011. We then averaged individual volunteer engagement rates across regions to assess regional differences. Because landowners a key stakeholder, we also analyzed landowner engagement rates across regions.



Note: Year to year engagement measured from first year volunteer engaged and every subsequent year until 2011. Any year that a volunteer was unable to participate due to a significant life change (e.g., serious injury, illness) was excluded from analysis.

- Volunteers in all regions were engaged in half or more possible years.
- Region with highest level of commitment from year to year was in Eastern Shelburne Co. (0.72).

Measure: b) Rate of year to year engagement among landowner volunteers as measured from year of initial engagement to 2011.

Region of NS	**# landowners engaged (2006-2011)**	**Ave. year to year commitment rate**
Cape Breton Island	0	n/a
Northern Mainland	2	0.75
Halifax Regional Municipality	11	0.81
Lunenburg + Queens Co.	11	0.74
Eastern Shelburne Co.	15	0.74
Western Shelburne Co.	4	0.50

- Landowners, one of our target stakeholder groups to engage in stewardship activities, show a consistently high year to year commitment rate in all regions except Western Shelburne Co.
- Low number of Northern Mainland landowners engaged is due in part to lack of consistent staff presence (four different seasonal staff from 2007 to 2011) and overall challenges recruiting volunteers in the region.
- Most Cape Breton beaches where Piping Plovers breed are provincial crown land with few private landowners within walking distance.

Assessment: A key component of the goal of the Government of Canada's Habitat Stewardship Program for Species at Risk is to "contribute to the recovery of endangered, threatened, and other species at risk, and to prevent other species from becoming a conservation concern, by engaging Canadians from all walks of life in conservation actions to benefit wildlife." Results presented in this case study on engagement show that we have successfully contributed to this goal.

One of the most encouraging results from this analysis is the growth of volunteer effort in all regions since 2006. Despite challenges engaging community members as volunteers in Northern Mainland and Cape Breton Island regions, these regions showed positive growth in engagement. We have adjusted our volunteer recruitment and coordination strategies based on staff capacities, and over the past three years we've focused more on mentoring existing volunteers and less on recruiting many new volunteers. This has allowed us to work one-on-one with individuals, help understand interests and build skills, and build long-term volunteers (or year to year commitment).

Results show that, on average, volunteers in all regions are engaged in more than half of all possible years. Highest year to year commitment (Eastern Shelburne Co.) was in a region where we've invested the most staff time to build and mentor our volunteer team, and where we have had a staff person from the community who works directly with volunteers. Shorebird workshops to help volunteers collect shorebird data on Piping Plover beaches during fall migration have been very popular in several regions. Special field trips to beaches have helped build stronger connections to landowners. In general, hiring local staff who are familiar with beaches and local culture has been important in helping build connections to landowners and other community members.

Source: Sue Abbott, Bird Studies Canada. Please contact Bird Studies Canada for questions or permission regarding use of this case study. Contact sabbott@bsc-eoc.org.