Measuring Progress

An Evaluation Guide for Ecosystem and Community-Based Projects

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University of Michigan

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This guide is available online along with the worksheets, the ***Evaluation Sourcebook***, supplemental literature reviews, and evaluation web links at **http://www.snre.umich.edu/emi/evaluation.**

For more information, please contact the EMI Program Coordinator at emi.office@umich.edu or 734-615-6431, or visit our web site at www.snre.umich.edu/emi

Preface

Who can benefit from this guide?

On a morning walk at your project site, you pause to notice the changes that have occurred around you. You and others have put a lot of time and effort into having a positive impact on this area. What effects have you had? Are you achieving the results you had hoped for? Would a different approach get you where you wanted to go more quickly or effectively? Anyone involved in ecosystem management or a community-based conservation project is faced with these questions. *Evaluation* is a powerful set of activities that can provide the answers and allow you to overcome some of the challenges of having a positive impact on the ground.

This guide provides a step-by-step process that allows projects of any size and at any phase to develop and implement evaluation. Whether you work for a small volunteer group or a government agency, whether you are doing community based conservation or ecosystem management, and whether the scale you are working on is a watershed or a forest preserve, using this guide can help improve the *effectiveness* of your project.

What's inside this guide?

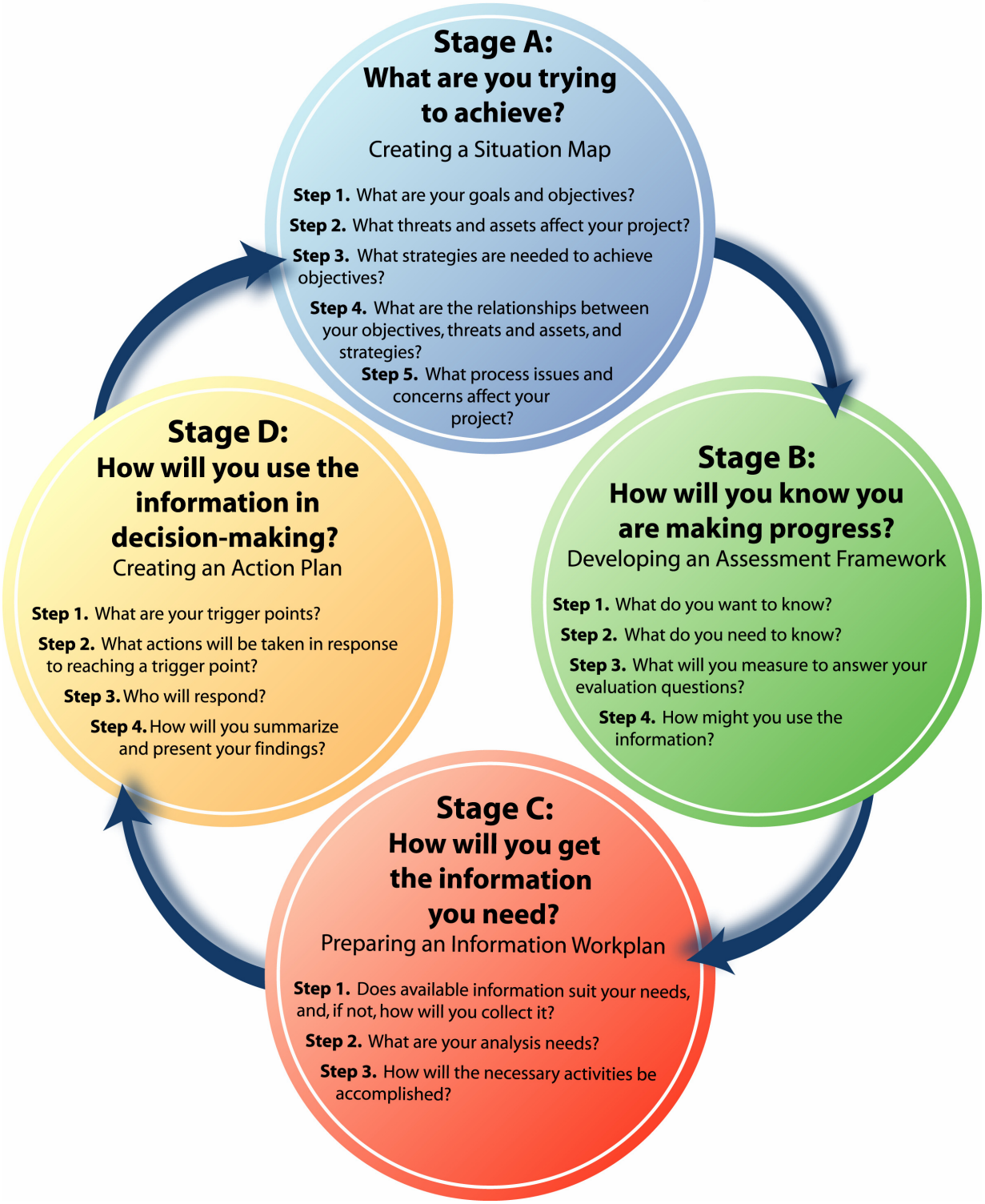
This guide is a tool to help you tailor evaluation to your project's unique needs and characteristics. By completing the enclosed worksheets and checklists, you will create *products* that help you:

- **Identify and clarify your project's goals and the multiple factors that influence your ability to achieve them**
- **Determine useful and feasible measures or indicators of progress toward your goals**
- **Gather the information you need to measure progress**
- **Make use of the information you have gathered by linking it directly to decision-making**

Evaluation activities, such as those described in this guide, have been shown to improve a project's clarity of purpose, overall effectiveness and levels of financial and public support. Ultimately, evaluation can increase needed on-the-ground change.

A companion publication, the ***Evaluation Sourcebook***, can support your use of this guide by providing tools and topic-specific evaluation information.

The Evaluation Cycle



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Introduction

Why Evaluate?

"Evaluation is critical. It is a way of documenting to funders, the public, and your team how effective your project has been since its inception. Evaluation activities can also help you provide important new information to community members about a local problem so that they can become partner in addressing the problem."

- Brian Wolcott, Walla Walla Basin Watershed Council, Oregon

"[Establishing a monitoring program has helped us] know for sure if our work plan and implementation is addressing the problems of the decline in species and if we truly have the opportunity to bring back many of the populations that have been extirpated."

- The Nature Conservancy, Conasauga River Basin of Georgia

Evaluation helps you achieve your objectives as efficiently and effectively as possible. Insight gained through evaluation enables you to identify the strengths and weaknesses of your approach and adjust accordingly: which aspects of your project work, which don't, and why? Knowledge of the effectiveness of your strategies can help you *maximize the impact of your limited resources*.

Evaluation can clarify your project's role within a complex system. Achieving specific on-the-ground ecological and social changes requires a clear picture of success and how to get there. However, it is likely that you work within complex ecological and social systems where simultaneous activities and a variety of circumstances – from natural disturbances to political cycles – are affecting the status of natural resources, the economy, and the community. Evaluation activities give you a necessary overview of the system and your project's role within it. This helps you define your desired outcomes and reveals how your efforts directly and indirectly affect these outcomes.

Evaluation improves group dynamics and processes. By facilitating dialogue among people and organizations involved in the project, evaluation

activities can help build understanding and support for your project. It can lead to clearer task assignments and greater accountability among project participants.

Evaluation builds support by documenting success. Being able to demonstrate success can promote support from the community and political officials. It can also enhance funding opportunities, because you can show donors how the conservation project is structured and document the positive effects that management is having on the landscape.

> "Maybe you find that one of the counties has really great trend information on some organism and you can showcase that and say, 'hey we ought to be bringing this up to a regional scale.' Part of this is not only to look for gaps but also to celebrate successes."
> - *Kent Fuller, Chicago Wilderness*

Evaluation helps you deal with uncertainty and change. Linked to the practice of ***adaptive management***, evaluation involves learning from experience and adapting activities accordingly. This approach can foster higher levels of on-the-ground success in the face of unavoidable uncertainties and inevitable change.

How do we know that evaluation matters?

Research on over 100 ecosystem management initiatives across the country indicates that projects that engaged in evaluation activities report significantly greater outcomes of their efforts.[1] Setting clear goals, creating systematic ways to monitor change, and implementing adaptive management approaches improve how groups manage their projects, and in turn make it more likely that they meet their objectives.

[1] Mark Brush, Allen Hance, Kathleen Judd, and Elizabeth Rettenmaier. Advised by Professor Steve Yaffee. 2000. *Recent Trends in Ecosystem Management*. Unpublished master's thesis, School of Natural Resources & Environment, the University of Michigan, Ann Arbor, MI. Available online at http://www.snre.umich.edu/emi/pubs/emtrends.htm.

With all these benefits, why don't groups carry out evaluation more often?

- Many groups feel that they lack the money or the time to engage in evaluation and that time spent "evaluating" or questioning is time taken away from "doing."
- Groups may feel threatened by the notion of evaluation, believing that it is judging their actions.
- Groups may lack the capacity for extensive data collection or sophisticated analysis and feel that evaluation cannot be done any other way.
- Groups may avoid evaluation because they feel they cannot agree on a clear set of objectives.
- Groups may simply not question the effectiveness of their strategies or approach.

What happens when groups don't evaluate?

- They spend significant money and time pursuing strategies that may not cause change.
- They do a lot of great things, but no one knows about them, which hinders efforts to expand their project.
- They lack the clarity of purpose that promotes a sense of ownership in the project and strong support for it.

By structuring the process according to your needs, you can overcome many perceived barriers and reap the benefits of evaluation. While some evaluations are complex and require significant time and funds, often evaluation can be accomplished using resources and information that are *already available*. Furthermore, a *lack* of evaluation often can be more expensive and time consuming than integrating simple evaluation activities into your project's way of doing business. *This guide leads you through the process of evaluation and provides assistance in how to engage in evaluation activities that are both feasible and relevant for your project.*

What is the "Process of Evaluation?"

Evaluation is an ongoing process for doing better. Most think of evaluation as the last stage of a project's activities – to capture everything that's been done. However, setting clear objectives, measuring progress toward objectives, and linking new information into decision-making are all a part of evaluation. Fully *integrating* evaluation into a project's way of doing business ensures that decisions and actions are based on a clear and up-to-date understanding of the system and that projects are doing their best.

Evaluation is learning applied to doing.

Evaluation answers questions. The evaluation process involves asking and answering questions and then incorporating the findings back into your project. It is an effective and efficient approach to *problem solving*.

Evaluation is not the same as monitoring. Monitoring is simply a set of measuring activities. If monitoring is done without a clear plan of how the information will be used, then much of the effort is wasted – raw data will accumulate in file cabinets. Evaluation involves developing specific *questions* to guide monitoring so that information collected is directly *relevant to decision-making*.

Monitoring is only part of evaluation

	←----------Evaluation----------→			
	←----------Research----------→			
	←-----Questioning-----→	←-----Monitoring-----→		
Step taken	*Ask a question*	*Measure a variable*	*Analyze information collected*	*Make a management decision*
Same as	Reflect, wonder, voice uncertainty	Measure, track, assess, collect data, inventory	Statistical analysis, data analysis, expert opinion, critical comparison, visual assessment	Plan actions, strategic planning, adaptive management, scientific basis of management
Examples	Is our prescribed burn program having a positive impact on native flora?	Percent cover of lupines in several $1m^2$ plots	Significantly greater cover of lupines in burned than not burned plots	Continue prescribed burns in oak savanna
	Is planting trees along streams increasing water quality?	Number of trees planted along streams	Lack of relationship between trees planted and annual turbidity	Discontinue strategy of tree planting if results similar over next four years
	Have outreach activities changed people's attitudes about the project area?	Survey of "attitudes towards landscape"	Responses more positive in counties with outreach activities	Expand outreach program to other counties

Why Use *This* Guide to Evaluation?

This guide pulls together a diverse set of ideas drawn from current literature and the experiences of on-the-ground project managers *into a compact and useable workbook*. We draw on several bodies of knowledge, including ways to understand ecological and social systems, critical indicators for measuring change in those systems, and approaches for creating effective collaborative ecosystem management processes. You can find out more about the theory and experience that informed this guide by visiting our web site, www.snre.umich.edu/emi/evaluation.

There are other resources that provide planning or assessment guidance for ecosystem management or community-based conservation[2]. This guide is in many ways inspired by these, but it is also purposefully different in several ways:

- **Multi-metric**: Guidance is provided not only for measuring *ecological* objectives, but also *socioeconomic* objectives, as well as issues related to your project's *process*. You will also learn how to measure progress on many levels, from the *implementation of strategies* to *intermediate impacts* to ultimate *outcomes*.
- **Practical**: This step-by-step guide to the process of evaluation can be used together with the consult-as-needed ***Evaluation Sourcebook***, which provides a collection of necessary topic-specific questions, indicators, references and tools.
- **Streamlined**: By minimizing text and providing options for different levels of use, this guide aims to make evaluation feasible even with limited time and funding.

Measurable project topics

Ecological = Concerns associated with the species or processes of an ecosystem, such as biodiversity, endangered species, or water quality.

Socioeconomic = Concerns associated with the human communities living in or near ecosystems, such as their economy, character, and quality of life.

Process = The variety of ways that project participants make decisions, communicate, and carry out activities.

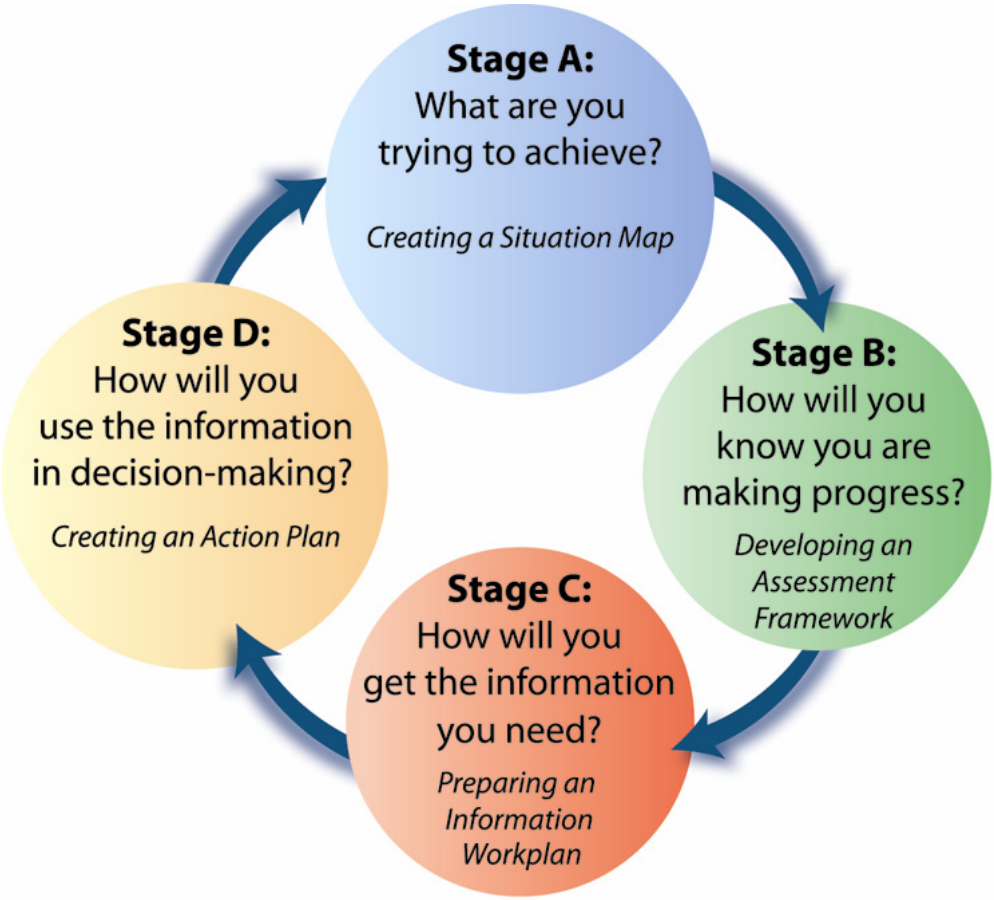
[2] See Bibliography.

How to Use this Guide

The Stages and Products of the Guide

Depending on the number of participants, objectives, and strategies involved in conservation projects, evaluation efforts can become unwieldy. To avoid a potentially overwhelming situation, it is useful to break evaluation into manageable stages. **In this guide evaluation is split into the four stages shown below.** As the figure depicts, *the process of evaluation is not linear, but iterative*. That is, information gained from the process can be used to begin the process again with more clarity and effectiveness. What's more, at any one time projects can be engaged to some degree in every stage.

Your project can benefit simply from using the **key questions in the evaluation process** *to think about your activities.*



The tools of each stage can be used and re-used throughout the life of your project. How you use the guide will depend on your project's needs and capacity. Below we describe each stage and product of the guide and how and when it may be most useful to your project.

Stage A Creating a Situation Map: What are you trying to achieve?

A **Situation Map** depicts the known and assumed relationships between your project's goals, strategies, and threats and assets.

A situation map is a visual diagram of your project's goals and strategies that illustrates how they relate to each other and to external circumstances or factors that are either facilitating your progress towards goals (assets) or preventing or hindering progress (threats). Creating this picture gives new insight into your project's role within the system and *allows you to make informed decisions about which aspects of your project you need to evaluate in order to be more effective*. While a situation map often aids in the development of meaningful strategies at the *initial* phases of a project, examining it at key intervals or developing one for a *mature* project can help to reevaluate objectives or strategies, and identify what is influencing your project's ability to make progress.

Stage B Developing an Assessment Framework: How will you know you are making progress?

An **Assessment Framework** is a prioritized list of questions and indicators that will be used to evaluate progress.

An Assessment Framework, developed using your Situation Map, identifies specific, measurable *questions* with answers that can then feed directly into decision-making. Evaluation questions ask how the systems you are trying to affect are changing, how well you are mitigating threats or capitalizing on assets, or the extent to which you are implementing strategies. For each question you also choose appropriate *indicators*, or measures that allow you to answer that question. The ***Evaluation Sourcebook*** provides lists of common questions and indicators, serving as a toolbox to complete this stage. An Assessment Framework can also be used to improve the value of an *existing monitoring program*.

Stage C Preparing an Information Workplan: How will you get the information you need?

An **Information Workplan** identifies how you will gather and interpret the data you need to answer your evaluation questions.

An Information Workplan lays out the "nuts and bolts" of your evaluation. It identifies the kind of *information* you need to measure your indicator and answer your questions, *how* you will acquire and examine that information, and *who* will complete the necessary activities.

Stage D Creating an Action Plan: How will you use the information in decision-making?

An **Action Plan** highlights the decisions you plan to make as a result of the information you collect.

An Action Plan lays out how you will use the results of your evaluation to reassess your situation and *improve project planning and decision-making.* Thus, it completes the evaluation loop, linking back to the Situation Map. Stage D also guides you in thinking about ways to *communicate* the results of your evaluation so that you can gain support for documented successes and share lessons learned with other projects.

How do I begin to use the guide? Start by familiarizing yourself with the evaluation stages and products in this guide, outlined in the previous two pages, plus in the **example** and **preview** that follow. Looking over the completed worksheets at the end of each stage can also clarify what an 'evaluation plan' is. Then skim the questions listed in the **Getting Started** section. This will help you consider what you want to get out of this and who should be involved. Talk to other project participants, board members, and project stakeholders about evaluation. There are many ways to then actually engage in these stages, from *facilitated workshops* to *independent activities*. Suggestions are given throughout the guide.

At what phase of my project can evaluation be done? Evaluation activities can be done at any phase of your project. Whether you are just beginning to plan your project or completing a 20-year assessment, you can engage in effective evaluation. If your project is just getting started, this guide can help you better understand the breadth of issues that you are focusing on and clarify your project's objectives. If your project is more mature, this guide can help you integrate evaluation into your regular activities in order to learn from and improve those activities.

How do these evaluation activities relate to planning processes I already use? Your group may have already gone through planning processes to get started, to meet government regulations, or to pull together information for funders. This guide is not a substitute for that process nor does it repeat it. Evaluation activities can be used to *enhance* your existing planning process.

What if I don't have the time to complete a stage? Working through the steps in this guide can provide you with concrete evaluation products, but you can also benefit from *simply browsing* through the **? prompting questions** of the Guide and the topics listed in the 📖 ***Evaluation Sourcebook***. These can give you a better idea of how to evaluate your project.

What if I get stuck? We have collection of supplementary evaluation material and links to other evaluation sites that may help you. Visit our website at www.snre.umich.edu/emi/evaluation .

To Help You Use the Guide

The guide is organized in four **stages**, each consisting of a series of manageable **steps**. **Headers on each page** let you know where you are.

Stage B ✧

Step 2: Prioritization

Tear-out **worksheets** are provided for you to develop the products of each stage.
These worksheets are also available as *Excel spreadsheets* at
http://www.snre.umich.edu/emi/evaluation

Date: _____

Goals	Objectives	+/ -	Threats & Assets	Strategies and Activities

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Definition boxes clarify terms used, and these terms appear in a **glossary** at the end.

Process = the variety of ways that project participants make decisions, communicate and carry out project activities.

How-to boxes give you tips and techniques to complete the steps of evaluation and to adapt these steps to your project.

How to **Brainstorm**

- Have a clear focus of what types of ideas you are trying to generate (see below)
- Brainstorm in a group and allow everyone to contribute or do it individually first and then compare.

Each step has a **checklist** that allows you to keep track of what you have completed.

To do:

❑

Prompting questions guide your thinking to help you fill in the evaluation worksheets.

? Ask yourself these questions:

A related document, the ***Evaluation Sourcebook***, provides a menu of questions and indicators for common ecological, socioeconomic, and process aspects of projects.

To make the process more understandable and concrete, we use the "Dana River Watershed Project" to provide **examples** of completed worksheets at each step.

The Dana River Watershed Project Example

Throughout the guide we will use examples from the "Dana River Watershed Project" to give you a clearer idea of how to fill in worksheets. Although this example is hypothetical, it is based on projects that face similar issues.

The Dana River Watershed Project began eight years ago when a group of citizens learned about a report published by the State Department of Environmental Quality indicating that water quality had declined significantly in the Dana River since the early 1960s. The declining water quality was associated with changing water and land use patterns in the area and was creating adverse conditions for local wildlife, especially fish and endangered mussel species. At the same time, these citizens were aware of increasing development pressure from the nearby city of Waterton, which not only posed an additional threat to river water quality, but had the potential to alter the region's rural character which local residents had come to enjoy.

In response to these pressures, a group of twelve concerned citizens formed a committee to pursue ways to protect the cultural and natural resources of the Dana River Watershed. Recognizing the need to work collaboratively with others and reflect the diverse interests in the area, they held a public meeting at the Town Hall. After a few lively meetings they formed a Board of Directors that included local residents as well as representatives from the state Department of Natural Resources (DNR), the U.S. Bureau of Land Management (BLM), the USDA-Natural Resources Conservation Service (NRCS), the Dana River Sport Fishing Council, and a regional nonprofit conservation organization. Two overall goals for the project were identified:

- Protect and restore biodiversity and water quality in the Dana River watershed;
- Maintain the rural character of the watershed.

In order to achieve these goals, the group recognized the need to address issues such as the loss of native riparian habitat, the increased spread of invasive salt cedar plants that negatively affect water levels in the river, and heightened conflicts between local farmers, ranchers, anglers, developers and environmentalists over stream access, irrigation, housing developments and grazing rights on public lands.

For the first two years of the effort, the project board concentrated on raising money for a full-time coordinator and funds for project initiatives. Today, with oversight by the board, the coordinator manages several activities including volunteer river restoration work days, involvement in a local fish passage working group, and facilitation of monthly educational forums that involve open discussions of environmental and economic development issues in the region. These meetings are well attended by a diversity of stakeholders ranging from state and federal officials to ranchers and local businesses.

More recently, as the project has secured more funds and community involvement, its activities have come under greater public scrutiny. Questions have arisen as to the accomplishments and effectiveness of the project. Noting Dana River's apparently poor water quality, some community members have suggested that the group needs to focus more attention on runoff from farms and rangeland. Others have suggested a need to directly address the effects of sprawl such as loss of open space and rising costs of living. Project board members also worry that because volunteers are working on so many different projects at once, it is difficult to get a sense of the value of each effort. Members are deeply committed to the group's mission, and feel that progress has definitely been made, but are unable to document their impact for funders and community members. Through evaluation, the Dana River Watershed Project aims to improve the effectiveness of their current and future strategies and maintain public support by showing the impact of their efforts.

A Preview

To give you an idea of what you will produce as you work through the guide, the worksheet examples below show parts of the evaluation plan developed by the Dana River Watershed Project. The worksheets may be confusing or overwhelming; but remember they are the *end product* of each stage.

Getting Started

Before beginning the evaluation plan, the Dana River Watershed project participants thought about their reasons and capacity for evaluating, how they hope to benefit from evaluation, and their evaluation goals.

Worksheet - Clarify your purpose of engaging in evaluation

To find out if we are having an impact; to demonstrate our progress to funders and the public; to motivate ourselves; to decide whether we should adjust our focus or change our strategies

Worksheet - Clarify who will be involved in evaluation

Project managers, board of directors, volunteers, our chamber of commerce, experts from the university; input from our funders

Stage A: What do you want to achieve?

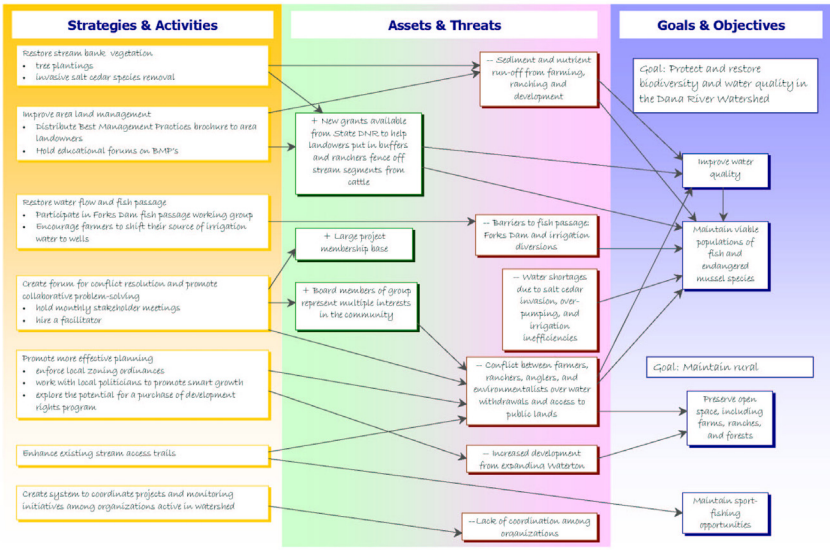
They then listed their project's goals, objectives, threats and assets, and their strategies in Worksheet A.

Worksheet A - Creating a Situation Map

Goals	Objectives	Threats (–) & Assets (+)		Strategies and Activities
Protect and restore biodiversity and water quality in the Dana River Watershed	Improve water quality	–	Sediment and nutrient run-off from farming, ranching and development	Restore stream bank vegetation • tree plantings • invasive salt cedar species removal

They depicted the relationships of the contents of their worksheet in a situation map. **This map helped them understand how their project fit into the bigger picture, and they began to see which relationships were most uncertain or most important to their project's success.** Their effort also helped build a joint understanding of the project's objectives and strategies among project participants.

Situation Map[3]



Stage B: How will you know if you are making progress?

Dana River Watershed Project participants used their Situation Map to develop a list of questions – things they needed to know about their objectives, strategies, threats and assets.

Brainstorm Sheet B1 – Questions about your objectives

Is water quality improving?

Are we meeting water quality standards?

Are fish and endangered mussel populations recovering?

Has the character of the region become less desirable?

[3] A larger version of this map is located at the end of Stage A.

Based on these questions, they selected indicators, or measures of what they were interested in, and determined how they could assess a change in their indicators by comparing them against a different place or time. To check whether they had the right set of questions and indicators for their evaluation needs, they considered whether answers to their questions would be useful for decision-making.

Worksheet B – Developing an Assessment Framework

Priority for evaluation	Evaluation Question	Indicators	Comparisons	Uses of the Information
Water quality	Is water quality improving?	Index of Biological Integrity (IBI); Sediment loads;	Trends over last 10 years;	For annual Dana River Report Card, provides a direct measure of outcomes

Stage C: How will you get the information you need?

Dana River Watershed coordinators clearly laid out the information that they need and what they will need to do to get it. Assigning responsibilities **made the task list tangible** and helped each of the members understand their responsibilities.

Worksheet C - Preparing an Information Workplan

Question	Indicator and Comparison	Information		Type of Analysis	Responsibilities		
		Data	Source		Collect/ obtain	Store	Analyze/ examine
Is water quality improving?	Index of Biological Integrity (IBI) over last 10 years	composition & abundance of fish and invertebrates	Dana College Bio 282 course	analysis of statistically significant change over time	Professor Jenn Walker & students	project website	Professor Jenn Walker & students

Stage D: How will you apply new information to decision-making?

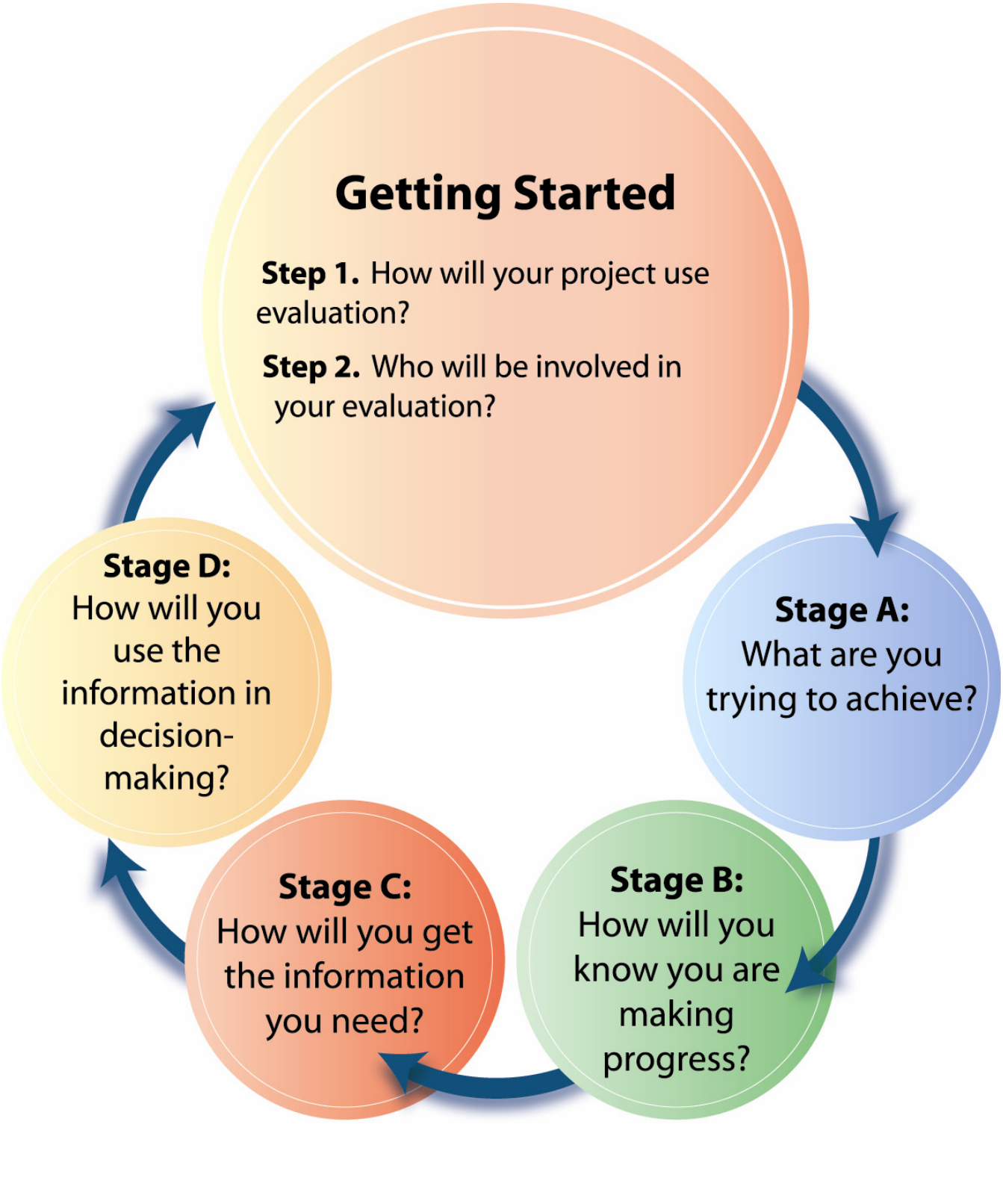
The Dana Project team completed the evaluation loop by developing **a clear idea of how they would *use* their evaluation information**. Trigger points helped them decide when the information would warrant reconsideration of planned actions. Developing possible courses of action meant they would be ready to respond. Accountability was built in by identifying when and by whom decisions and actions would take place. In addition, by understanding that the group had no way of responding to some outcomes, it allowed them to re-prioritize their data collection approach so that they invested scarce resources into items on which action could occur.

Worksheet D – Agreeing on an Action Plan

Question	Indicator and Comparison	Trigger Point	Possible Actions	Who Will Respond
Is water quality improving?	Index of Biological Integrity (IBI) over last 10 years	lack of any IBI increase by 2004	- conduct or fund an experiment to directly test the effect of riparian buffers on water quality	on-staff hydrologist

Ready? Let's begin!

Getting Started


Getting Started
Step 1. How will your project use evaluation?
Step 2. Who will be involved in your evaluation?
Stage A: What are you trying to achieve?
Stage B: How will you know you are making progress?
Stage C: How will you get the information you need?
Stage D: How will you use the information in decision-making?

Getting Started

Clarify your purpose for engaging in evaluation

Purpose

To begin you must clarify what you hope to gain out of evaluation and how evaluation activities will fit into your project's current activities. This ensures that ***your project's needs and capacity direct your use of the guide***.

Knowing what you want out of evaluation will help you approach it effectively. Evaluation can be simple or complex - the key is that it is useful to you. If you only want to assess progress towards a particular goal, then pictures of a field taken at several points in time may be sufficient to inform your management decisions. If you are engaging in evaluation primarily to report progress to funders or the public, then your measures of progress will need to be understood by them. If you are interested in evaluating your whole organization, then you may be looking at many goals and strategies and determining relationships between different sources of data. Remember that you can always build on your evaluation activities as resources become available.

Take a moment now to tear out or copy the "Getting Started" worksheet located in the back of the guide.

To do:

- Using the prompting questions and guidance below, consider your general current needs and capacity for evaluation and how you hope to benefit from evaluation.
- Respond to the "Clarify your purpose of engaging in evaluation" questions in the **Getting Started Worksheet**.

? Ask yourself these questions to clarify why you are engaging in evaluation:

- Of the benefits of evaluation listed in the introduction, what does your project hope to gain?
- How would you expect evaluation to improve or increase the effectiveness of your current planning, monitoring or implementation activities?
- *Who* do you expect to benefit from your evaluation activities? What audience or participants do you expect to learn or gain capacity from these evaluation activities?

NOTE: Throughout the guide questions like these ("Ask yourself…:) will appear. They will prompt your thinking to more effectively complete the worksheets of each stage.

Clarify who will be involved in evaluation

Purpose

The people who engage in the evaluation process should be the people who care about the results or can help act on information gained. Depending on your project, these people may include government officials, environmentalists, agency staff, tribal government officials, resource users (farmers, ranchers), funders, or local businesses. Evaluation could also involve anyone who might help in the process, i.e. those with some experience or expertise in organizing collaborative activities or in collecting or analyzing data. Involving many groups in evaluation activities will help to improve your project's *credibility* and allows those involved to gain *experience* in the process so that they can facilitate future evaluations. Involving multiple parties also leads to a *joint understanding* of the situation and why certain strategies are being used. Involving affected and responsible groups can help ensure that evaluation is *integrated* into decision-making.

There are different ways to involve others in the use of the guide. You may want to have a central coordinator, form a group to work through the process together, or start alone and then involve others as needed. Alternatively you can turn to facilitators or experts to help the group make progress, either by drafting specific products for review by the group, or by creating processes to help the group work through these activities.

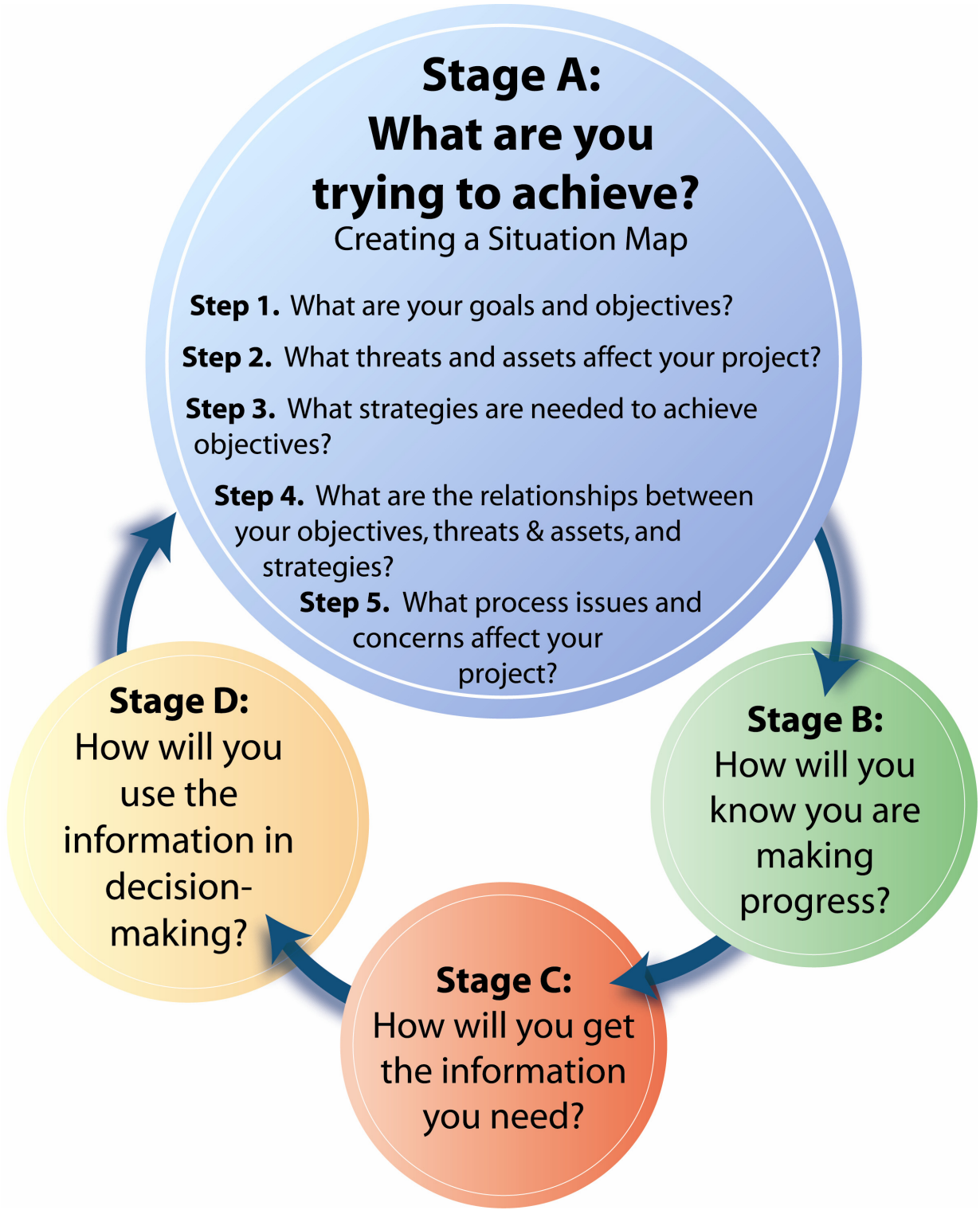
To do:

- Using the prompting questions below, consider who will be involved in evaluation and who will provide leadership.
- Fill in the rest of the **Getting Started Worksheet.**

? Ask yourself these questions to determine who should be involved in evaluation:

- Who are people who have an interest in the project's activities and might care about the results of evaluation?
- Who is responsible for decision-making?
- Who has evaluation-related experience or expertise?
- Who are good coordinators or enthusiastic leaders?

Stage A


Stage A:
What are you trying to achieve?
Creating a Situation Map
Step 1. What are your goals and objectives?
Step 2. What threats and assets affect your project?
Step 3. What strategies are needed to achieve objectives?
Step 4. What are the relationships between your objectives, threats & assets, and strategies?
Step 5. What process issues and concerns affect your project?
Stage B:
How will you know you are making progress?
Stage C:
How will you get the information you need?
Stage D:
How will you use the information in decision-making?

Stage A
Creating a Situation Map:
What do you want to achieve?

Purpose

The purpose of Stage A is to help you design a "map" of your project. You will first compile and then create a visual representation of how you navigate within the larger social and natural system: the paths (**strategies**) you use to overcome roadblocks (**threats**), and the shortcuts (**assets**) you use to arrive at your destination (**objectives** and **goals**). This map can be used as:

1. ***A strategic planning tool***. It can help you identify key threats that are not being addressed or a lack of strategies to accomplish certain objectives. You can also use the map to *prioritize* actions and highlight approaches you will pursue later.
2. ***A fundraising and communication tool***. Many funders ask for "logic models" to explain the overall theory of your project. A situation map can do this effectively. It can also provide a visual for communicating what you are doing to stakeholders or the public.
3. ***An evaluation tool***. A Situation Map helps you make informed evaluation decisions to document project impact and improve effectiveness. Seeing all levels of your project together allows you to prioritize elements for evaluation. A map also helps you identify the hypotheses or *key uncertainties* that you have about the relationships between strategies, threats, assets and objectives.

If you have an existing management or strategic plan, this information will be useful for this stage. The Map provides a visual image of the plan and its context, and it allows you to identify your evaluation needs.

How to create a Situation Map for a very large or complex project

For a complex system, for example an entire watershed with several sub-watersheds, it is useful to get the whole picture, but with less detail than the sub-watershed situation map. Focus instead on overarching or very significant goals, and approaches instead of specific activities. Add detail to sub-project maps.

Please take a moment now to tear out or copy Worksheet A "Creating a Situation Map" located in the back of the guide. A sample completed worksheet is provided at the end of this Stage.

Step 1
What are your goals and objectives?

Purpose

To track progress requires a clear statement of what you aim to achieve. In Step 1 you will identify and articulate your **goals and objectives**. *If your project has already developed goals and objectives*, you can skim this step and list your goals in the worksheet that will form the basis of your situation map.

Goal = a statement of the *desired condition* of some part of the system. Collectively, goals represent your project's mission or aspirations over time. (e.g. protect native oak savanna biodiversity or maintain community well-being).

Objective = a more *specific* statement detailing the desired outcomes of a project, often in measurable terms (e.g. at least 90% native vegetation along stream banks or increased recreational opportunities).

To do:

- Identify project goals
- Identify more specific project objectives
- Write your goals and objectives in the appropriate columns of **Worksheet A**.

? Ask yourself these questions to determine your goals:

- What are you trying to accomplish? What is the mission of your project?
- What is it that you are trying to change or improve?
- What would you hope be true about the project area if your project was successful?

Consult the *Evaluation Sourcebook*. For ideas see ecological and socioeconomic goals and objectives that are commonly stated by natural resource and ecosystem management projects.

How to articulate your goals

One way to start this process is to focus on your project mission statement or strategic plan, which describes the purpose of your work. From this statement, you should list a few short goals – the accomplishments you hope to achieve over time – in the "goals" column of Worksheet A. If the project does not have agreed-upon goals, a focused discussion among project members would be a good place to start. This activity could either be started by a draft set of goals written by the project coordinator, or a blank slate. Achieving consensus on a set of goals will help the project in many ways.

Making your objectives specific and measurable

Ideally, an objective should be specific and measurable, because this makes it easier to assess progress towards them. *If, at this point, you cannot frame an objective in measurable terms, focus on making it specific*. You will come back to your objectives in Stage B where further guidance will be provided on how to actually *measure* progress.

What does "measurable" mean?

Objectives can be measurable in several ways. For example, if the general goal is to create "healthy" local parks, your objectives can be stated in terms of measurable attributes of the parks, such as number of native species, degree of soil erosions, etc. Alternatively, for the goal of improved community well being you could have the objective of 'high' job satisfaction, measureable on a 1 to 10 scale.

? Ask yourself these questions to frame your objectives:

- What smaller or shorter-term outcomes would bring you towards your larger goals or mission?
- What are the more specific, concrete, or tangible components of your goal?
- Would you know when you had achieved your objective, i.e. does it have a clear desired level, condition, or amount?
- Is your objective attainable?

Complete a list of objectives (at least one per goal) for each of your stated goals.

Dana Watershed Example: Worksheet A

Goals	Objectives	Threats (–) & Assets (+)		Strategies and Activities
Protect and restore biodiversity and water quality in the Dana River Watershed	Improve water quality			

Write in your project's goals and more specific and measurable objectives.

By the end of this step you should have articulated your project's significant goals and objectives.

Step 2
What threats and assets affect your project?

Purpose

Many factors influence the ecological and social conditions of the area in which you work and affect your ability to achieve your objectives. By including these factors in your Situation Map, you will be able to visualize how they relate to your objectives and strategies and which are the most influential to your project.

In Step 2 you will identify both the threats and assets that affect your project. **Threats** are circumstances or forces that either directly or indirectly hinder progress towards the goals you have for the ecosystem or community in which you work. Common threats include invasive species, pollution, or conflict among stakeholders.

> ***Threats*** = circumstances that influence progress towards goals in negative ways
>
> ***Assets*** = circumstances that influence progress towards goals in positive ways

By contrast, **assets** are circumstances or opportunities that have a positive effect on your project's ability to achieve objectives. Examples of assets include large tracts of already protected land, a newly elected key decision-maker who is sympathetic to your cause, or a growing interest in volunteering among the public. While threats may be more apparent, identifying and capitalizing on your assets can prove equally critical to project success.

To do:

- Identify and list threats (–) in the "Threats & Assets" column of **Worksheet A**
- Identify and list assets (+) in the "Threats & Assets" column of **Worksheet A**

*It is easiest if you complete this and the next step for **one** goal and its associated objectives, **and then return to steps 2-3 for you next goal** and its objectives*.

For help identifying your threats and assets:

Ask yourself these questions:

- What is preventing (or may prevent) your project from achieving your objectives?
- What is helping (or can help) your project achieve your objectives?
- What opportunities could be capitalized upon to achieve your objectives?

Consult the *Evaluation Sourcebook*. See the threats and assets that commonly affect ecological and socioeconomic objectives.

As you list threats and assets in the work sheet you will find that some only affect certain objectives, while others are repeated – they affect more than one or even all of your objectives! At this point, just list them to the right of the relevant objectives, repeating as necessary. *You will capture the **relationship** between threats or assets and your objectives* later in your situation map.

Also consider process issues as assets and threats

Sometimes very influential to your project's success is the **process** by which people work together, such as: the level of communication or trust between participants, opposition from particular groups, your organizational structure, or the presence of strong leadership or committed volunteers. Understanding the extent to which process issues affect your project can prove critical to understanding whether your group has the right process in place to achieve your substantive (ecological, social, economic) objectives.

> ***Process*** = the variety of ways that project participants make decisions, communicate, and carry out project activities.

? Ask yourself these questions to consider process issues:

- How does the way in which your group members work together affect your ability to achieve objectives?
- Do participants share a perception of common challenges and a desire to work together to overcome them?
- Is your effort credible or legitimate in the eyes of participants and those not immediately involved in the project?
- Do participants share information well and resolve uncertainties constructively?
- Is the effort managed well and in a way that allows parties to participate effectively in decision-making and project activities? Are parties accountable for their commitments?
- Does your process allow for response to changing ecological, economic, and social conditions?

Don't worry if your response to such questions is "I don't know," "maybe," or "sort of." These questions are meant to help you identify some process weaknesses or strengths to evaluate. *You may even decide that you have* ***process goals and objectives***, such as to improve collaborative problem-solving or increase the coordination among project activities. You can list these in **Worksheet A** together with the threats and assets that affect them. *Even if you cannot attach process threats and assets to an objective at this time*, write them down in their own rows in **Worksheet A**.

📖 **Consult the *Evaluation Sourcebook***. Process issues can be especially difficult to identify – see the framework of process-related issues for help.

Dana Watershed Example: Worksheet A

Goals	Objectives	Threats (–) & Assets (+)		Strategies and Activities
Protect and restore biodiversity and water quality in the Dana River Watershed	Improve water quality	–	Sediment and nutrient run-off from farming, ranching and development	
		+	Large project membership base	

Determine factors that negatively affect your objectives (–) as well as those that facilitate progress (+).

By the end of this step, you should have a list of the threats and assets that affect the objectives related to one of your goals. After completing the next step, identifying strategies, return to this step to list the threats and assets associated with your next goal and its objectives.

Step 3
What strategies are needed to achieve objectives?

Purpose

Strategies = the approach you will take to achieve objectives, including actions to mitigate threats and build on assets.

Activities = a detailed set of tasks or actions to implement a strategy

The final step before building your Situation Map is to identify and list the **strategies** you will use to achieve your objectives. Strategies are planned actions aimed at mitigating threats and building on assets to achieve your objectives. For example, the Dana River Watershed Project may have strategies of restoring stream bank vegetation and improving area land management, both of which work toward the goal of protecting biodiversity and water quality. Broader strategies such as public education and policy reform may address several threats and assets simultaneously. In addition to evaluating your group's strategies for achieving ecological and social goals, it is important to measure your group's strategies aimed at *process* issues, such as creating a community forum to discuss controversial issues or a community newsletter to improve communication.

Often several **activities**, or specific tasks, are needed to implement a strategy. For example, reducing invasive non-native species might include the following activities: burning, applying herbicides, and/or educating the public about the benefits of planting native species. Defining activities helps participants realize what work actually needs to get done, but *if you are creating an overall situation map for a large or complex project*, this level of detail is not helpful.

To do:

- Identify strategies you use (or plan to use) to achieve your objectives.
- Identify activities you use (or plan to use) to implement your strategies.
- List these strategies and their activities in the strategies column of **Worksheet A**.

? Ask yourself these questions to identify your strategies and activities:

- What overall strategies are needed or are currently being used to bring you closer to your goals by
  - improving the condition of the system directly?
  - mitigating or reducing threats?
- protecting or leveraging assets?
- What are you doing to implement an effective process? What are you doing to organize and coordinate people in your project?
- What tasks need to be completed to implement your strategy?

 **Consult the *Evaluation Sourcebook*,** which provides a framework of common strategies used by ecosystem management and community-based conservation projects.

As with threats and assets, you may find that some of your strategies are aimed at more than one issue. For example, the strategy of holding river clean-up days may be aimed at reducing pollution – a threat related to the objective of increased water quality. At the same time, this strategy contributes to the objectives of increased ecosystem stewardship and environmental awareness. For now, just list your strategies to the right of the relevant objectives and threats/assets, repeating as necessary. *You will capture the **relationships** between your objectives, threats, assets and strategies* in the next step, "Creating a situation map."

Dana Watershed Example: Worksheet A

Goals	Objectives	Threats (–) & Assets (+)		Strategies and Activities
Protect and restore biodiversity and water quality in the Dana River Watershed	Improve water quality	–	Sediment and nutrient run-off from farming, ranching and development	Restore stream bank vegetation • tree plantings • invasive salt cedar species removal
		+	Large project membership base	

Fill in how you plan on reducing a threat, taking advantage of an asset or achieving your objectives

By the end of this step, you should have a list of your objectives, the threats and assets that affect your objectives, and the strategies and activities that you plan to use or are using to change the situation.

Dana Watershed Example: Worksheet A – Complete

Goals	Objectives	Threats (–) & Assets (+)		Strategies and Activities
Protect and restore biodiversity and water quality in the Dana River Watershed	Improve water quality	–	Sediment and nutrient run-off from farming, ranching and development	Restore stream bank vegetation tree plantings invasive salt cedar species removal
	Maintain viable populations of fish and endangered mussel species	+	New grants available from State DNR to help landowers put in buffers and ranchers fence off stream segments from cattle	Improve area land management Distribute Best Management Practices brochure to area landowners Hold educational forums on BMP's
		–	Barriers to fish passage – Forks Dam and irrigation diversions	Restore water flow and fish passage
		–	Water shortages due to salt cedar invasion, over-pumping, and irrigation inefficiencies	Participate in Forks Dam fish passage working group Encourage farmers to shift their source of irrigation water to wells
		+	Large project membership base	
		–	Conflict between farmers,	Create forum for conflict resolution

Dana Watershed Example: Worksheet A – Complete

Goals	Objectives	Threats (–) & Assets (+)		Strategies and Activities
			ranchers, anglers and environmentalists over water withdrawals and access to public lands	and promote collaborative problem-solving hold monthly stakeholder meetings hire a facilitator
		+	Board members of group represent multiple interests in the community	Create system to coordinate projects and monitoring initiatives among organizations active in watershed
		–	Lack of coordination among organizations	
Maintain rural character of region	Preserve open space, including farms, ranches and forests	–	increased development from expanding Waterton	Promote more effective planning enforce local zoning ordinances work with local politicians to promote smart growth explore the potential for a purchase of development rights program
	Maintain sport fishing opportunities			Expand existing stream access trails

Step 4
What are the *relationships* between your objectives, threats and assets, and strategies?

Purpose

In this step you will complete your Situation Map – a visual representation of the key relationships between your objectives, threats and assets, and strategies. In steps 1-3 you identified the relationships among objectives, threats and assets, and strategies by rows. A map allows you to view the system as a whole – it gives you the "big picture." Especially in complex systems or situations with feedback and simultaneous activities a map reveals relationships not apparent in a table. It highlights which threats, assets, and strategies are more influential than others, by showing how many objectives they affect. The Situation Map also helps you identify possible unintended connections between activities and *key uncertainties* about the ways that components relate to each other. Identifying these relationships allows you to *focus on what it is you really need to know about your system* to achieve your goals. Asking targeted questions means that the information you derive from evaluation will be directly applicable to your project.

The Situation Map is a model.
Models can help you understand and act on the system you care about, while you continue to refine your knowledge of the relationships ongoing in the situation and how to best achieve your objectives.

To do:

- Create a Situation Map based on **Worksheet A** that explicitly illustrates the relationships between your objectives, threats and assets and strategies
- Highlight key uncertainties within your Situation Map

How to make a Situation Map

Situation maps can be created through a variety of media. Software available from the Institute for Human and Machine Cognition (the IHMC Concept Map Toolkit) can be accessed on the EMI website (www.snre.umich.edu/emi/evaluation). It allows you to create a situation map electronically. The software can be helpful for organizing your map and for making it available to others.

If you are developing your concept map as a group exercise, you can make the process more tactile by using sticky notes with different colors for strategies, threats and assets, and objectives (see below). You can then turn this draft into a neat visual document using the software above or any drawing program.

You can follow these steps to create a situation map by hand and/or in a group setting:

1. Copy your objectives, threats and assets, and strategies from **Worksheet A** to sticky notes, abbreviating as necessary (or write them on sticky notes to begin with, using the worksheet only to organize them by column).
2. On an easel-pad, chalk or dry-erase board, align your sticky notes in the order they were in your worksheet, in three main columns, this time organizing your *strategies* along the *left*, the threats and assets in the center, and the *goals and objectives* on the *right*.
3. Draw arrows between each of your threats/assets and the objective(s) it affects (see how-to box next page). If you had a repeated threat or asset, write it only once and show its multiple effects using several arrows or a note that says "affects all objectives."
4. Draw arrows between each strategy and the factor that it relates to, again using multiple arrows to depict how a strategy addresses multiple threats or assets.
5. Stand back and see if any major relationships have been left out.

Why are the objectives on the left of the worksheet but on the right of the map?

When listing all the elements of your situation it makes sense to start with goals and branch out from there, as you would in planning. In the map, however, you highlight causal relationships, and these go most intuitively from left to right - from strategies (what you are doing) to threats, assets, and goals (what you are affecting).

How to **draw meaningful connections**

Going from a compiled set of boxes to drawing arrows that link them can be overwhelming. Here are some pointers:

1. Draw *only* the most significant or direct relationships. At some level everything is related and too many arrows makes the map illegible.
2. To think about what is connected, try developing *sentences that tell a story* about the "logic" underlying your project. For example, "our education program (strategy) uses the boardwalk along the river (asset) to increase understanding and appreciation of the ecosystem (objective)." Try verbs like "promotes," "develops," "strengthens," "prevents," or "minimizes" to describe an arrow.
3. You could use different color arrows to denote positive (increases/enhances/supports) *vs*. negative (decreases/reduces/prevents) relationships.

Identify key uncertainties in your Situation Map

The Situation Map you have created is a simplified model, not reality. The arrows in your map are essentially hypotheses, or informed guesses, about how the various elements of your situation affect each other. Evaluation will help you to *test* these hypotheses. At this time, identify key uncertainties and emphasize them so that you can come back to them later. One way to highlight uncertainties in your map is to draw a question mark in a circle above the connecting line. Alternatively, you could make lines of different thickness depending on your level of certainty of the relationship.

? Ask yourself these questions to identify key uncertainties in your Situation Map:

- What relationships on the situation map are the most important? Are you certain about the existence or the strength of these relationships?
- After looking at interactions between the elements of your Situation Map, do you see relationships that look tenuous? Which are well understood? Which are more of a guess? Which do you want to know more about?

After you have developed the Situation Map, establishing the relationships between the various elements, and identified key uncertainties, make sure that it appears complete. Often, the Situation Map will trigger identification of

other threats, assets, or strategies related to project objectives. For example, something like limited funding may not have been listed, because it may not relate to any one objective, but it could still be a pervasive threat in your situation map.

? Ask yourself these questions to help complete your Situation Map:

- After looking at your draft Situation Map, are there objectives that are missing?
- Are there threats or assets that are missing?
- Do the strategies seem appropriate to mitigate the threats or leverage assets towards achieving your objectives and goals?
- Does the map adequately represent the current situation?

By the end of this step, you should have a completed Situation Map – including the relationships among your project's goals, objectives, threats, assets and strategies – with question marks to indicate key uncertainties.

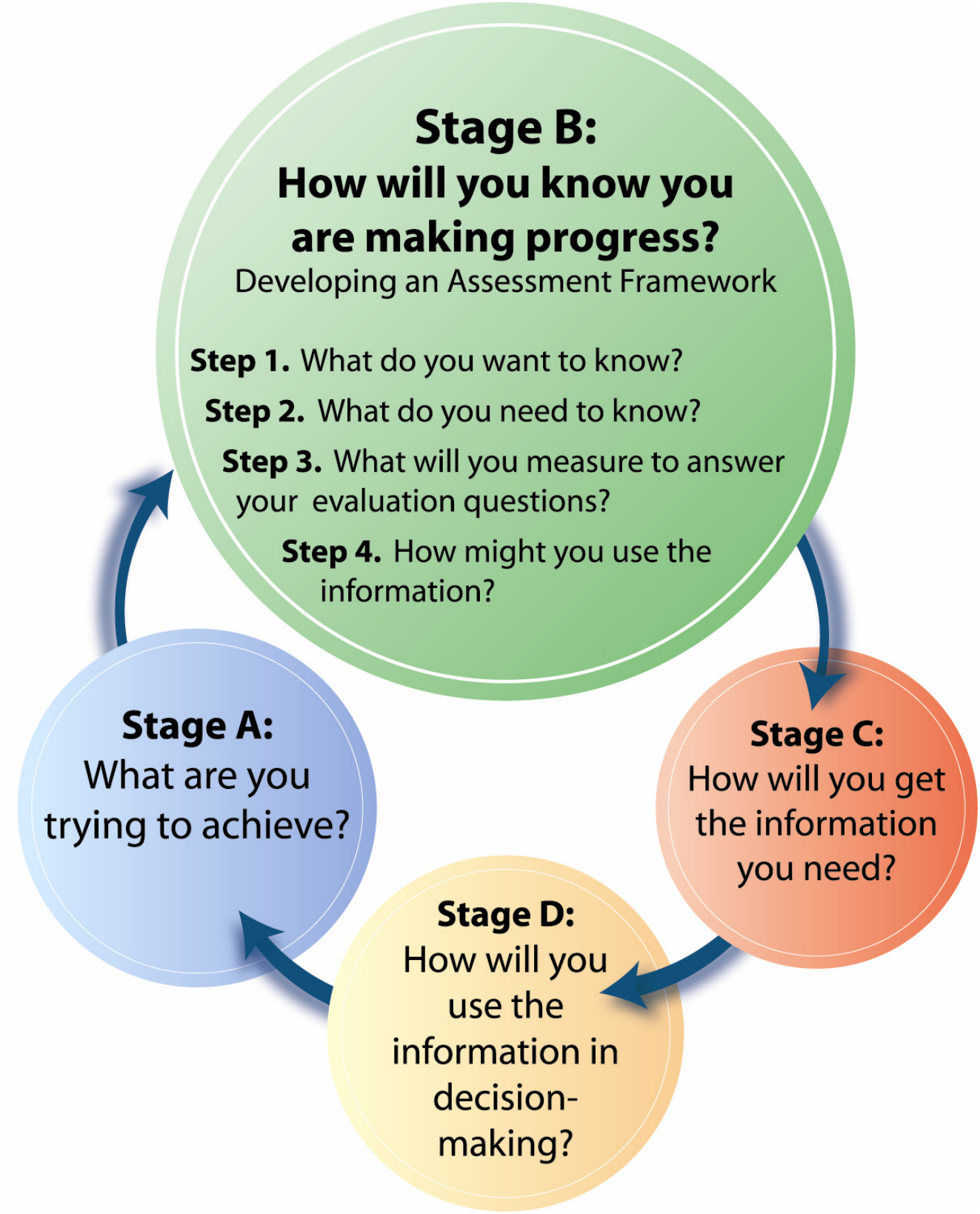
Situation mapping can help parties understand their project in a new way.

Gary Back, the ecological manager with the ***Northeastern Nevada Stewardship Group*** commented on the importance of stepping back and viewing the project through a new lens: "Keeping the big picture, that's one of our challenges. It's very frustrating to me, when we started working with the sage grouse and people said there were a lot of silver bullets out there – its predation, or its brood habitat, or its hunting – and if you just correct that one problem then everything will be fine. We need to be looking at how these various silver bullets are interrelated, and what that means on a bigger scale of functioning ecosystems. For instance, there are fuels management efforts going on, grazing management decisions, and wildlife strategies for sage grouse management. When you look at what's being done, if those three initiatives are pulled together, they can all work in the same direction. So if you are doing a fuels management project, and if you do it in the right way, it can be done to enhance sage grouse habitat and livestock forage/nutrition."

Dana Watershed Example: Complete Situation Map

Available on the following fold-out page.

Stage B


Stage B:
How will you know you are making progress?
Developing an Assessment Framework
Step 1. What do you want to know?
Step 2. What do you need to know?
Step 3. What will you measure to answer your evaluation questions?
Step 4. How might you use the information?
Stage A:
What are you trying to achieve?
Stage C:
How will you get the information you need?
Stage D:
How will you use the information in decision-making?

Stage B
Developing an Assessment Framework:
How will you know you are making progress?

Purpose

In Stage B you will use your Situation Map to identify specific, measurable questions with answers that can then feed directly into decision-making for your project. *Not only will you decide on the questions you want answered through evaluation, but also measures that will give you the answers.*

At the end of this stage you will put your organized set of **evaluation questions** and associated **indicators** to the test by imagining whether the results of your evaluation efforts would provide truly useful information for your program. *In this way you will be certain that the **Assessment Framework** you have produced addresses your program's evaluation needs effectively.*

> ***Evaluation question*** = a specific answerable question about an element or a relationship between elements in your situation map.
>
> ***Indicator*** = an attribute of a system that can be measured or described. An indicator gives information on the state or condition of something or on the relationship between elements in a system. It can signify changes in a system and can be used to answer evaluation questions. (In this guide we will use the terms "measures" and "indicators" interchangeably, though an indicator can also be thought of as "indication" of something not measured directly)

Please take a moment now to tear out or copy Brainstorm Sheets B1-B3 and Worksheet B "Developing an Assessment Framework," located in the back of the guide. Sample completed worksheets are provided at the end of this Stage.

Step 1
What do you want to know?

Purpose

Several questions may have emerged while you were working through Stage A, including: "How close are we to achieving our objectives?," "Is a particular threat becoming more serious?," or "How do I know if my strategy is as effective as I think it is?" *The development of evaluation questions is one of the most critical steps in the process of developing an evaluation plan.* The evaluation questions you choose will determine the indicators you will use, the data you will collect and, most importantly, the information your efforts will produce to improve your project. Because of the importance of developing useful questions, in the next two steps we guide you through a process that allows you to refine your list of questions from several different perspectives. In Step 1 you will take a *broad* perspective on aspects of your project that you want to evaluate, and in Step 2 you will apply several criteria to *prioritize* and *link* these questions.

Evaluation questions can focus on measuring project objectives, threats and assets, or strategies and activities. Most projects address a mix of questions.

Even if you think you already have the questions you want answered, skipping Step 1 may mean you won't ask the most useful questions. Here's why. There are three related categories of questions you can ask about your project:

1. **Are we completing planned activities?**
2. **Are we reducing threats and leveraging assets?**
3. **How close are we to achieving our objectives or desired outcomes?**

A common tendency in evaluation is to ask only the first category of questions – what tasks have been accomplished. It is important to measure whether planned actions were completed or not, but by limiting evaluation to this type of question, a project may never realize whether their actions are producing desired change or not. *Climbing a mountain requires stepping forward, but also periodic checks on whether those steps are moving toward the summit.* We guide you through a brainstorming session for *each* of the three categories of evaluation questions, so you consider the *full range* of questions you could pose about your project.

To do:

- Using your situation map, run three different brainstorming sessions to compile a list of potential evaluation questions.
- Record your questions in the brainstorming sheets provided.

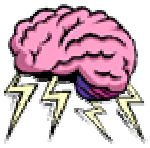
To begin, use the situation map as a visual tool to prompt thinking about useful evaluation questions. You can study your map and identify elements and relationships whose status is critical to the success of your project. It is also useful to identify evaluation questions about elements or relationships that are more *uncertain*, in order to expand your understanding of how your system works and what will "move" it toward your objectives.

If your map is not complex and contains a small number of elements, you can proceed by framing questions and indicators for each box (element) or arrow (relationship) in your situation map. But if your map has many boxes and arrows, this can be overwhelming. Instead, you can use the map as an overall guide to thinking about key evaluation questions, as described below.

Brainstorming is a great tool in the process of evaluation, because it generates ideas that may not come up in a more structured forum. In this case, reflecting on what it is you want to know will reveal paths and shortcuts to success you may not have considered before. Focusing your brainstorming session on a particular category of evaluation questions (see next page) will make the process more manageable and productive.

How to Brainstorm

- Have a clear focus of what types of ideas you are trying to generate (see below)
- Brainstorm in a group and allow everyone to contribute or do it individually first and then compare
- Record *all* ideas: Do not judge, criticize, or dismiss ideas – valuation will occur in later steps
- When you're out of ideas, force yourself to add three more – that's when really thoughtful ideas can surface



BRAINSTORM SESSION 1: How close are we to achieving our objectives?

? Looking at the goals and objectives in your Situation Map, list questions specific to your situation that are similar to these general questions:

- What is our current situation relative to our objectives?
- What is the current state of the ecosystems or communities we are trying to affect?
- How are we doing with respect to…?

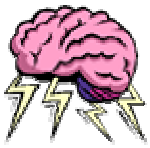
Dana Watershed Example: Brainstorm Sheet B1

Is water quality improving?

Are we meeting water quality standards?

Are fish and endangered mussel populations recovering?

Has the character of the region become less desirable?



BRAINSTORM SESSION 2: How effective are our strategies at reducing threats and using assets?

? Looking at your threats and assets and how they relate to your strategies and to your objectives, list questions specific to your situation that are similar to these general questions:

- Is a threat decreasing?
- Have our strategies reduced threats?
- How well have we capitalized on assets? Are we losing existing assets?
- What might be the *unintended* consequences of our actions?

Dana Watershed Example: Brainstorm Sheet B2

Are sediment and nutrient loads into the river decreasing?

Are new land management practices decreasing stream bank erosion?

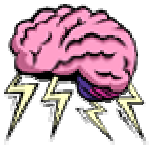
Have interpretative panels decreased misconceptions about the watershed?

How many landowners use existing grant programs for riparian area improvement?

Has conflict eased since the beginning of the project?

If I am interested in progress towards objectives why also evaluate threats and assets?

Measuring progress only in terms of changes in desired outcomes (objectives) is limited. For one, you may need information on progress in the short-term, before any outcomes are evident. Second, only knowing whether the ecosystem or community is changing does not tell you *why* it is changing, that is, whether your actions had something to do with it – directly or via your effect on threats or assets.



BRAINSTORM SESSION 3: Are we completing planned activities?

? Looking at the strategies and activities in your Situation Map, list questions specific to your situation that are similar to these general questions:

- Are we accomplishing the tasks or actions we set out to do?
- How efficiently are tasks completed?
- Do we have the necessary tools, time, and resources to complete tasks?

Dana Watershed Example: Brainstorm Sheet B3

How much of the stream bank has been revegetated during volunteer workdays?

How many landowners have received Best Management Practice brochures?

How often are stakeholder meetings held? How many attend?

If you are having difficulty listing potential evaluation questions…

…because you can't even imagine the answer or how you would go about finding out the answer – don't worry. Determining what you want to evaluate is an *iterative* process. Write down any questions you have about relationships drawn in your map and later you will come back to them to assess their feasibility and relevance.

For additional help developing evaluation questions:

 **Consult the *Evaluation Sourcebook***, which provides numerous sample evaluation questions related to common ecological and socioeconomic objectives and threats, process issues and project strategies.

By the end of this step, you should have reflected on your project and created three lists of potential evaluation questions related to 1) how close you are to achieving your objectives, 2) how effectively your strategies are reducing threats and leveraging assets, and 3) how well you are accomplishing planned activities.

Step 2
What do you *need* to know?

Purpose

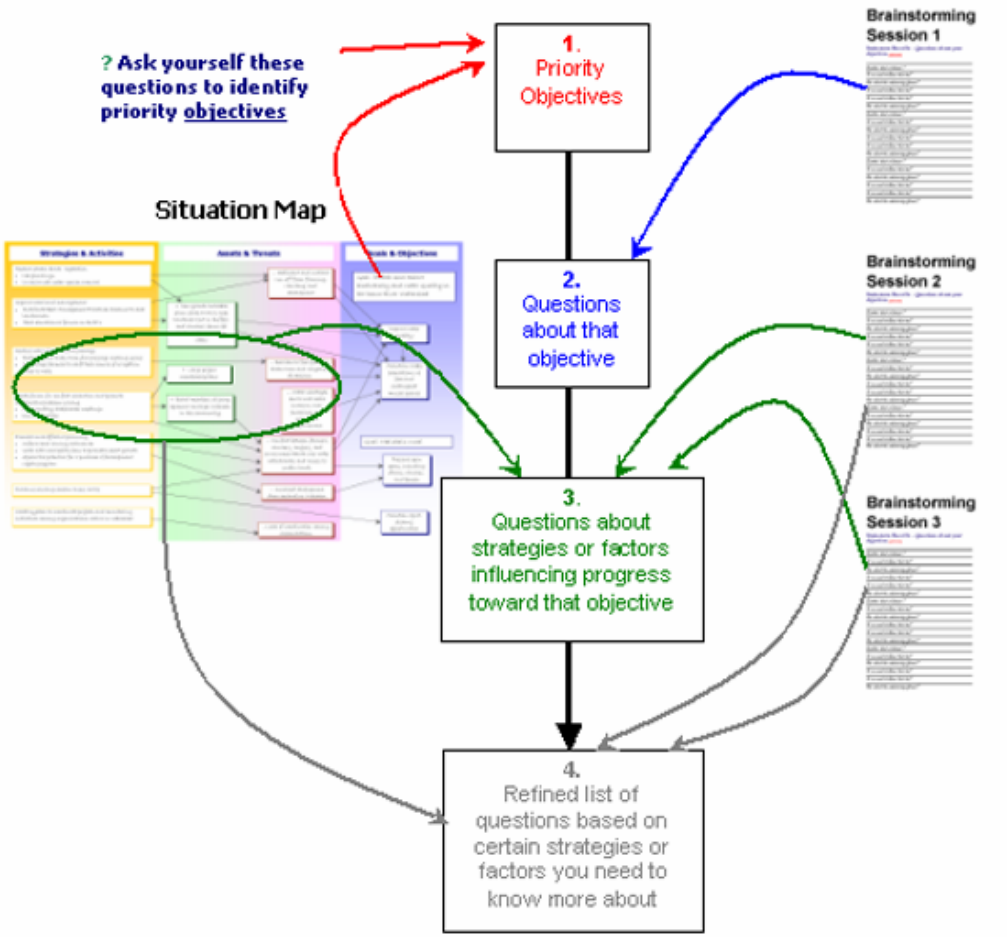
Unless you have unlimited time and resources, you will only be able to answer some of the questions you have posed in Step 1. In Step 2 you will limit your list of evaluation questions to those that are currently most useful for your program to evaluate. Certain topics may be more critical than others because of the intensity of certain threats, participant interests, the timing of funding or political cycles, or the phase of implementation of the project. For example, issues of how the group works together – such as understanding how effectively information is exchanged – may need to be addressed before ecological or socioeconomic threats can be dealt with.

How will you decide which questions are currently more useful to answer than others? This step provides questions that prompt you to decide whether certain objectives, threats and assets, and strategies merit evaluation more than others. Considering these questions will help you think critically about **which elements of your project need to be evaluated *first* and which need to be evaluated *together* to give you useful and complete answers**. Going through this process will *ensure that your group is making strategic use of limited resources.*

To do:

- Using the criteria below, identify priority objectives for evaluation.
- List questions that ask about those objectives.
- Add strategy effectiveness and implementation questions that, based on your Situation Map, relate to priority objectives.
- Refine your list of questions by identifying which threats, assets, or strategies are priorities for evaluation.

The flow chart below gives you an overview of how you will use your Situation Map and questions from each of your brainstorming questions to come up with a select list of prioritized and integrated evaluation questions. *Each step of this process is on the following pages*.



1. Priority Objectives

? Ask yourself these questions to identify which objectives need to be evaluated more than others:

- Which objectives are *absolutely critical* to your project's success? That is, which are critical to your project's mission?
- Which objectives are *participants*, *stakeholders and/or funders* most interested in knowing whether they are being met?
- Which objectives have the *most arrows* leading toward them in the Situation Map (reflecting multiple threats or assets and/or multiple strategies aimed at that objective)?
- Which objectives are you under *time-pressure* to achieve (perhaps because of time-limited funding or political support) and, thus, for which immediate knowledge of progress is critical?
- For which objectives are you *uncertain* about how close you are to meeting that objective – do you know the current status?

Based on the questions above and the discussion that results, **list your "Priority" objectives in the first column of Worksheet B**, leaving at least five rows blank between each objective. Also **circle these objectives on your Situation Map** to help you with the next steps.

Dana Watershed Example: Worksheet B

Priority for evaluation	Evaluation Question	Indicators	Comparisons	Uses of the Information
Water quality				

2. Questions about priority objectives

Now, for each objective, look at the list of questions produced by your first brainstorming session – "How close are we to meeting our objectives?" – and select the question(s) that ask *directly* about that objective. List these questions in the second column of **Worksheet B** *and* write a **check mark** next to them on the brainstorm sheet.

Dana Watershed Example: Worksheet B

Priority for evaluation	Evaluation Question	Indicators	Comparisons	Uses of the Information
Water quality	Is water quality improving?			

3. Questions about strategies, threats or assets influencing progress towards priority objectives

Next, select questions from your second brainstorming session (How effective are our strategies?) and your third brainstorming session (Are we completing planned activities?) are *directly* related to achieving the priority objective – see your Situation Map. List these questions next to the priority objective in the second column of **Worksheet B** *and* write a **check mark** next to them on the brainstorm sheet.

By choosing a set of related questions from all three brainstorming sessions you get the complete answer to whether your project is achieving an objective, and *why or why not.* Otherwise, you will only answer whether the prairie or community, for example, is changing, but not know *how* that change is related to *your efforts*.

Dana Watershed Example: Worksheet B

Priority for evaluation	Evaluation Question	Indicators	Comparisons	Uses of the Information
Water quality	Is water quality improving?			
	How many landowners use the existing grant programs for riparian area improvement?			

4. Refine your list: Check if any priority threats, assets or strategies have been left out

It is possible that a threat, asset or strategy needs evaluation even if it is not directly linked to a priority objective. For example, your priority may be to evaluate progress towards your goal of increased water quality. Although invasive plant species in forests may not have a direct link to water quality you may be interested in tracking this treat to terrestrial biodiversity, because you have noticed that it is becoming more prominent.

To make sure that your list of evaluation questions covers your project's needs, check whether there are certain threats, assets, or strategies that you need to know more about, but have not already included in Worksheet B. To do this, first use the prompting questions below to *identify* your priority threats, assets, and strategies. You can circle them in your map as you identify them.

? Ask yourself these questions to identify threats or assets that should be priorities for evaluation:

- ⇨ Is the reduction of certain threats (e.g. pollution, unemployment) seen as important to the community? To funders? Stakeholders?
- ⇨ Do certain threats cover much larger areas than others?
- ⇨ Are certain threats more severe (have a more intense, lasting, or irreversible impact on the system)?
- ⇨ Do certain assets have the potential to have a much larger impact on the project than other assets?
- ⇨ Are certain assets time-limited and need to be leveraged now, instead of later?
- ⇨ Which important threats or assets do you feel you are responding to least effectively?

? Ask yourself these questions to identify strategies that should be priorities for evaluation:

- ⇨ For which strategies are the most staff and/or volunteer time and/or resources spent?
- ⇨ Which strategies are you the least certain about their effectiveness? Which strategies are most controversial? Which strategies are most experimental?

- Based on your situation map, which strategies mitigate the most threats? Which mitigate threats with the largest impact?
- Which strategies are supported by funders or, if shown to be effective, have the potential to receive funding? Which require continued funding in order to be effective?

Now that you have identified the threats, assets, or strategies you need to know more about, determine which of these are *not* already addressed in the questions in Worksheet B. Write them in their own rows below the questions you have already. Then revisit your questions from your second and third brainstorming sessions – "How effective are our strategies?" and "Are we completing planned activities?" – and choose unchecked questions that deal with your additional priorities. Add these in the evaluation question column of **Worksheet B**.

Dana Watershed Example: Worksheet B

Priority for evaluation	Evaluation Question	Indicators	Comparisons	Uses of the Information
Water quality	Is water quality improving?			
	How many landowners use the existing grant programs for riparian area improvement?			
Conflict over resource use	Has conflict eased since the beginning of the project?			

How to **minimize your evaluation needs**

Collecting information can be enormously useful for your project, but at the same time can be costly and time-consuming. Consider the following to pare down your list of evaluation questions:

- *Reiterate this prioritization step* to ensure that you have pared down your questions to what is critically important for your project's success.
- *Put questions that are not relevant or useful at this stage on the back burner.* You cannot address questions about strategy if it is still in the planning phase or has just begun and is expected to have only long-term effects. In that case, questions related to the accomplishments of tasks are more useful.
- *Draw extensively on the experience of others.* Are there other projects that already know the answers to some of your questions, especially those that are not site-specific? Tap into available knowledge at conferences, meetings, in reliable publications and websites.

Dana Watershed Example: Worksheet B--Priority Evaluation Questions

Priority for evaluation	Evaluation Question	Indicators	Comparisons	Uses of the Information
Objective: Water quality	Is water quality improving?			
	How many landowners use the existing grant programs for riparian area improvement?			
Conflict over resource use	Has conflict eased since the beginning of the project?			

Write in the questions from your brainstorming sessions that relate to an objective you need to evaluate and/or address a priority threat, asset or strategy. For related questions, circle the ones that you think are most important to answer.

By the end of Step 2 you will have a select set of integrated questions that address the objectives, threats and assets, and strategies that are most important for your project to evaluate at this time.

NOTE: D*o not discard the more extensive lists of un-prioritized evaluation questions from your brainstorming sessions.* They will undoubtedly be useful to return to at a later phase in your project.

Step 3
What will you measure to answer your evaluation questions?

Purpose

Now that you have the questions you want answered, the next step is to determine information you will need to provide the answer. In Step 3 you will identify the measures or indicators that will allow you to answer your questions. You will also identify comparisons or benchmarks against which to measure a change in your indicator.

Indicators are variables that can be measured or observed. Indicators come in all shapes, sizes, and forms. For example, if you asked whether your strategies are effective at eliminating invasive non-native species, an indicator to answer that question could be the percent-cover of non-native species in sample plots or the presence of a native species sensitive to non-natives. Because data for some indicators are difficult to obtain, *the indicator should only be as complex as your question requires*. For example, to answer the question, "Are community members becoming more interested in native plant landscaping?" you could perform phone interviews for several households to determine their use of native plants, or, more simply, obtain information on change in plant sales from local nurseries.

It pays to select good indicators

Indicators provide answers to your evaluation questions. More generally they can be used to:

- Inform you about the conditions of a system more easily or quickly than many more detailed measures.
- Alert you to important changes over time or differences between places.
- Motivate behavior (think of, for example, how knowing the Dow Jones index or the outdoor temperature affects decisions).
- Clarify strategy effectiveness when compared across places where strategies differ.
- Increase basic understanding of how the system works and how naturally dynamic it is over time.
- Make your objectives and progress over time directly measurable.

To give your indicators meaning, you will need to select a **comparison (**or "benchmark"). Comparisons allow you to assess a change or difference in an indicator, and should reflect your evaluation question. There are three types of comparisons:

Another time: Comparisons are often made by tracking changes in an indicator over time, which are **trends**, or by comparing an indicator to some particular time in the past. The past can either be a point in time (a **baseline** measure), before strategies were implemented, or it could be a **historical condition** (for example, pre-settlement conditions) known from written descriptions or pictures (see *range of natural variability* in the Ecological Objectives section of the ***Evaluation Sourcebook***). You may also want to compare the current value of the indicator to a specific number of years ago that relates to the **length of your planning cycle**.

Another place: An indicator can also be compared to another place – a **control** or **reference site** – where strategies are not implemented or where management practices are different (such as biological reserves, land under different ownership, or just a different plot).

An ideal: Progress can be measured by determining how similar the current state of an indicator is to the **desired condition** or to some **ideal**, even if not achievable.

To do:

- Select an indicator for each evaluation question.
- For each indicator, select a comparison to be used to measure change.
- Write your indicator and comparison into the "indicators" column on **Worksheet B**.

Ask yourself these questions to select indicators to answer your evaluation questions:

- What is the simplest thing that you can measure that would provide an adequate response to your question?
- Have you already phrased your evaluation question in terms of something that is measurable?
- Can you clearly state the purpose of measuring your chosen indicator? Can you explain what the indicator is meant to measure?
- Is there agreement among your project partners that your chosen indicator is an effective and appropriate measure? For evaluation results to be useful, you must be confident in your indicators, and so must others.
- Can one indicator be used to answer more than one question?

Good indicators are…

- Easy to interpret
- Only as fine-scaled as the question requires
- Widely applicable
- Cost-effective to measure
- Respond quickly to change

When choosing an indicator, also consider:

- Ease of measurement (time and cost)
- Use by other projects confronting similar challenges
- Availability of baseline data for the indicator
- Scientific understanding of the indicator
- The potential for measurement error and the cost of being imprecise or inaccurate

 **Consult the *Evaluation Sourcebook*.** To prompt your thinking, a number of commonly used indicators are presented for a variety of ecological, socioeconomic, and process outcomes, threats, and assets.

? Ask yourself these questions to identify comparisons:

- Are data available for your indicator in a different place or time?
- Are any long-term data available about your project's objectives or condition?
- Are there historical records for your sites, even if it is just descriptive or photos?
- What time period would be long enough to see changes in your indicator? Is there an indicator that would show changes sooner?
- How difficult would it be to collect baseline information before you start your strategy?
- Is there a site that is geographically similar to yours but is managed in a different way (by you or someone else)?

As you choose indicators and comparisons you may find that you have one indicator that could answer two questions, but with different comparisons; or that to answer your question you want to look at the relationship between two indicators. Thinking carefully about your question and looking at your list of indicators will help you create appropriate sets of indicators and comparisons.

The value of a well-chosen comparison

Choosing a meaningful comparison can give you a much more useful answer to your evaluation question. For example, imagine that your question is "Have our removal strategies decreased the threat of invasive species?" and your indicator is percent cover of invasives. You could measure this indicator in one place over time and look at trends. A more meaningful approach would be to compare this indicator in areas where you have active removal programs vs. areas where you do not. This will provide information not only on the change in the threat, but also the potential effectiveness of your strategy.

Dana Watershed Example: Worksheet B—Indicators and Comparisons

Priority for evaluation	Evaluation Question	Indicators	Comparisons	Uses of the Information
Objective: Water quality	Is water quality improving?	Index of Biological Integrity (IBI); Sediment loads; Nitrogen and phosphorus levels	Trends over last 10 years; leopold River (in wilderness area); State water quality standards	
	How many landowners use the existing grant programs for riparian area improvement?	% of riparian landowners in the program	Dana Watershed vs. neighboring Jefferson Watershed (where educational forums not held)	
Conflict over resource use	Has conflict eased since the beginning of the project?	# of newspaper headlines reflecting conflict; survey of area residents	trends since beginning of project	

Determine the indicators you will use to answer each of your evaluation questions, and select over what time or places you will compare your indicator to detect a change or difference.

By the end of this step, you should have indicators and comparisons for each of your evaluation questions.

Step 4
How might you use the information?

Purpose

Now it is time to put the list of questions and indicators you have developed to the test. By thinking about the results you might obtain for each indicator and how these results would influence your future management decisions, you reveal whether your indicators are *relevant*, *framed correctly*, and *worth* your time and resources. Completing this step *ensures that your Assessment Framework suits your project's evaluation needs and capacity*.

By thinking through expected results and writing down uses of the information for each indicator, you will be able to see any gaps, problems, or inadequacies of certain indicators. Does your indicator actually tell you what you need to know? It could be that an indicator you have chosen on the first round is *too general* to give you the information you need, that it *takes too long* to establish trends to answer your evaluation question, or that you have *no way of acting on it*. . After you have discussed your expected uses of the information, you may find it useful to go back to Step 3 and rework some of your evaluation questions, indicators, and/or comparisons.

For example, if your indicator is "trends in the abundance of songbirds" and you see a negative trend, what will you do with that information? If what you really need to know is whether some songbird species are more abundant and some less, then you need to *refine* the indicator to make it less general (e.g. trends in edge bird species). As another example, your indicator may not indicate what you want it to. Suppose your indicator of successful land acquisition is # of acres acquired, and you measure that 200 acres have been acquired. This does not tell you that the 200 acres is highly fragmented into 100 2-acre parcels. You may want to choose a different indicator that reflects how connected or unfragmented the land is so that this information provides an accurate measure of progress towards goals.

Thinking about how expected results may affect decision-making also brings to light what is realistic and prepares you for actions you may need to take if goals are not achieved as expected.

To do:

- See how well your indicators and comparisons answer your evaluation questions by noting how you might use this information.
- Write down potential uses in the last column of **Worksheet B**.

? Ask yourself these questions to identify usefulness of the information:

- Is the information meaningful to you?
- What new knowledge or understanding would the information provide?
- Will the data collected answer your evaluation question?
- Will your results help you make short and/or long-term management decisions or be useful in other ways (for example, to provide information to funders, key supporters, etc.)?
- How can you see this new information being incorporated into decision-making? Will you be able to act on it?
- Over what time period would you need data for an indicator before you will be able to make a management decision? Are there indicators that would give you the necessary information sooner?

Dana Watershed Example: Worksheet B

Priority for evaluation	Evaluation Question	Indicators	Comparisons	Uses of the Information
Water quality	Is water quality improving?	Index of Biological Integrity (IBI); Sediment loads; Nitrogen and phosphorus levels	Trends over last 10 years; leopold River (in wilderness area); State water quality standards	For annual Dana River Report Card, provides a direct measure of outcomes and Leopold River, which does not have the same threats, gives us a reference point
	How many landowners use the existing grant programs for riparian area improvement?	% of riparian landowners in the program	Dana Watershed vs. neighboring Jefferson Watershed (where educational forums not held)	To learn what % of landowners we still need to reach and the possible impact of educational forums
Conflict over resource use	Has conflict eased since the beginning of the project?	# of newspaper headlines reflecting conflict; survey of area residents	Trends since beginning of project	To assess effectiveness of forums for conflict resolution

Describe the information that might be used to affect management decisions or your project's ability to proceed or inform stakeholders

By the end of this step you should have identified whether you have chosen appropriate evaluation questions and indicators based on how you might use the information gathered from that indicator.

Dana Watershed Example: Brainstorm Sheet B1 -- How close are we to achieving our objectives?

Is water quality improving?

Are we meeting water quality standards?

How has the biodiversity of the Watershed changed since the beginning of the project?

Are fish and endangered mussel populations recovering?

Are we protecting existing open space?

How has the landscape changed in the last ten years?

Has the character of the region become less desirable?

Dana Watershed Example: Brainstorm Sheet B2 -- How effective are our strategies at affecting threats and assets?

Are sediment and nutrient loads into the river decreasing?

Are new land management practices decreasing the rate of stream bank erosion?

How many landowners use existing grant programs for riparian area improvement?

Is water diversion an increasing problem for target fish species?

Have interpretative panels decreased misconceptions about the watershed?

Has hiring a facilitator increased the use of collaborative-problem solving among parties?

Has conflict eased since the beginning of the project?

Can fish get upstream at Forks Dam?

Dana Watershed Example: Brainstorm Sheet B3 -- Are we completing planned activities?

How much of the stream bank has been revegetated during volunteer workdays?

How many landowners have received Best Management Practice brochures?

How many educational forums have we held? Have many landowners attended?

Have we identified which farmers will received BMP brochures?

How often are stakeholder meetings held? How many attend?

How actively are we involved in the Forks Dam fish passage working group?

How often are activities scheduled during conflicting times?

Are we allocating sufficient funds to monitoring activities?

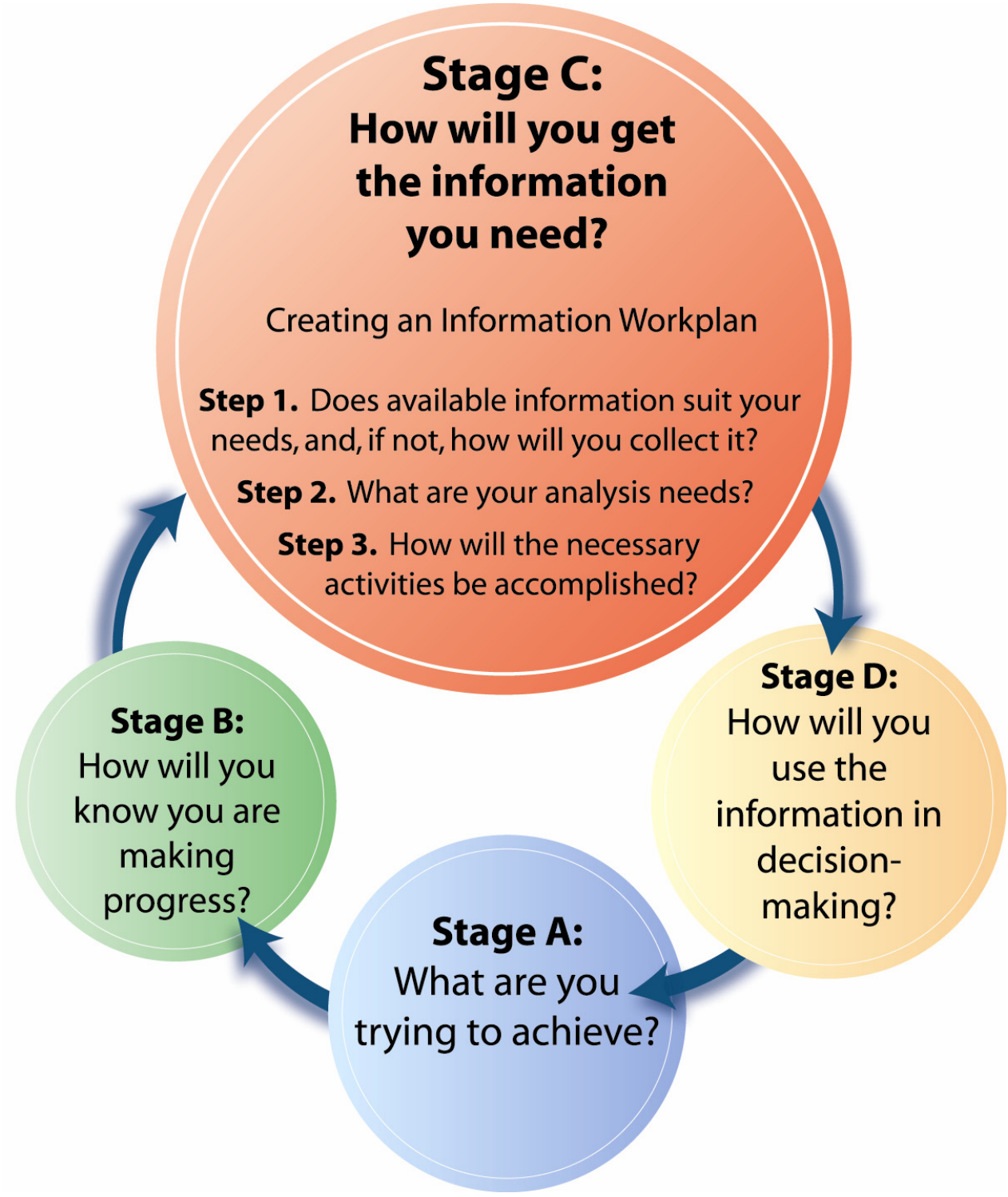
Dana Watershed Example: Completed Worksheet B – Assessment Framework

Priority for evaluation	Evaluation Question	Indicators	Comparisons	Uses of the Information
Water quality	Is water quality improving? Are sediment and nutrient loads decreasing?	Index of Biological Integrity (IBI); Sediment loads; Nitrogen and phosphorus levels	Trends over last 10 years; leopold River (in wilderness area); State water quality standards	For annual Dana River Report Card, provides a direct measure of outcomes and Leopold River, which does not have the same threats, gives us a reference point
	How much of the stream bank has been revegetated by volunteers?	# of miles of stream bank where plantings have been completed	Current vs. start of project; Current vs. planned levels	For Report Card and to identify where and how much riparian restoration is still needed
	How many landowners use the existing grant programs for riparian area improvement?	% of riparian landowners in the program	Dana Watershed vs. neighboring Jefferson Watershed (where educational forums not held)	To learn what % of landowners we still need to reach and the possible impact of educational forums
Viable populations of target species	Are fish and endangered mussel populations recovering?	Population size of key species	Trends over time	To determine extent of species recovery – will guide management decisions

Dana Watershed Example: Completed Worksheet B – Assessment Framework

Priority for evaluation	Evaluation Question	Indicators	Comparisons	Uses of the Information
	Is water diversion an increasing problem for target fish species?	Flow rate	Trends over last 20 years	To document impact of water diversion on stream hydrology - use to inform stakeholders about needed water use changes
Open space	Are we protecting existing open space?	# acres in open space (forest, farm and rangeland)	Current vs. start of project	Measure of goal of maintaining rural character
Conflict over resource use	Has conflict eased since the beginning of the project?	# of newspaper headlines reflecting conflict; survey of area residents	Trends since beginning of project	To assess effectiveness of forums for conflict resolution
Invasive species removal	Is salt cedar invasion increasing along stream banks?	Percent-cover of salt cedar	Areas with and without active removal	To assess severity of threat and effectiveness of removal
Membership base	Are we effectively motivating project members to volunteer?	% on mailing list that are involved in work days	Trends since start of project	Will help us know if we need to more actively motivate member participation in project activities

Stage C


Stage C:
How will you get the information you need?
Creating an Information Workplan
Step 1. Does available information suit your needs, and, if not, how will you collect it?
Step 2. What are your analysis needs?
Step 3. How will the necessary activities be accomplished?
Stage D:
How will you use the information in decision-making?
Stage A:
What are you trying to achieve?
Stage B:
How will you know you are making progress?

Stage C
Preparing an Information Workplan:
How will you get the information you need?

Purpose

Now that you know what information you need, how will you go about *acquiring that information* to answer your questions? In Stage C you will work out the "nuts and bolts" of your evaluation and *develop a concrete plan* that identifies the specific information you need and how you will get it.

Where does this stage fit into the bigger picture? In Stages A and B of this guide you gained an understanding of your project's situation and how to measure progress. *The full value of evaluation comes from acquiring and using information*. This means planning the specifics of data collection and analysis, which is what you will accomplish in Stage C. Deciding on how to interpret and use the information you acquire is the topic of the final stage in this evaluation guide, Stage D.

Data collection…
less overwhelming than it seems

The word "**data**" can make collection seem daunting, because many people associate it with numerical information collected in an experiment or study. For evaluation, you need **information**, which *includes data*, but can also be knowledge gained from oral or written communication or simply experience. It also helps to know that much of the information you need for evaluation *may already be available*, and does not require establishing a new monitoring program.

Please take a moment now to tear out or copy Worksheet C "Preparing an Information Workplan," located in the back of the guide. A sample completed worksheet is provided at the end of this Stage.

Step 1
Does available information suit your needs, and if not, how will you collect it?

Purpose

By selecting indicators in Stage B, you identified what features or indicators of the system you will examine to answer your questions. In this step you will use your **Assessment Framework** to determine whether the accuracy, precision and scale of available measurements are adequate for answering your questions, and, if not, how you will collect the information you need.

To do:

- List your evaluation questions, indicators and comparisons from your Assessment Framework in **Worksheet C**.
- Determine if available data meet your information needs.
- For indicators without available data, determine your approach to collect the information you need.
- Complete the "Information" column of **Worksheet C** by filling in a data source and type for each of your indicators.

To begin, list all of your questions and their associated indicator with comparison from your Assessment Framework into the first two columns of Worksheet C. It is important to *include the question and comparison*, because these will help you identify your data needs. For example, if you are measuring water turbidity, the data you need will depend on whether you are interested in trends at one site or in how turbidity compares among several sites under different management.

Realistically, how many indicators can I plan to measure? Because indicators differ in how easy they are to measure and in the information available to track them, there is no magic number of indicators beyond which evaluation becomes unfeasible. You will be able to judge *after* you determine the necessary logistics in Stage C whether you have too many to manage.

Once you have listed your indicators, determine if relevant *and* appropriate data are available.

There are many sources of useful ecological and socioeconomic data! For example, the United States Geological Survey has data on soils and water, Natural Heritage Program databases maintain information on plant and animal species, and the U.S. Census has many useful population statistics. Consider *sharing data* with organizations working in the same area or the same species. The ***Evaluation Sourcebook*** lists contact information for some useful sources.

Use available information only if it is relevant to your prioritized evaluation questions and meets your information needs, not just because it is available!

Capitalize on monitoring partnerships

In 1983, The Nature Conservancy approached the Forest Service for information on the threatened Oregon silverspot butterfly. The Forest Service *shared the research and management information it had accumulated over the previous two years of managing for the butterfly*, and Forest Service staff helped the Conservancy carry out a prescribed burn to hold succession at bay. The two organizations formalized their collaboration through a Challenge Cost Share grant in 1986. The relationship has been fruitful for the two organizations. According to TNC, "*Working together has allowed us to compare populations and habitat conditions across sites*. These comparisons have improved our understanding of the factors that affect the population dynamics of the butterfly."

How do I determine whether available data "meets my information needs?" There may be several ways to measure an indicator. For example, if your indicator is tree density, you could measure number of trees per square mile or instead use an estimate of density based on photographs. Your choice depends on the level of accuracy and precision you need to answer your question, the ease of analyzing and interpreting different types of data, and the spatial and time scale of interest.

? Ask yourself these questions to determine whether available data meet your information needs:

- Is quantitative or qualitative information more appropriate for your indicator? Which is more easily measured? Can quantitative information be made simpler by aggregating values into categories (e.g. tree height in meters vs. tree height class, 1-5)?
- What is the least amount of data needed to credibly answer your questions?
- Are direct measurements necessary or are estimates sufficient?
- Over what spatial scale do you need to have data? From what time period do you need the data (e.g., past 20 years, current records)? Your chosen comparison will help you answer this question.
- Is the data source credible?
- What level of accuracy is needed? What level of precision?

Not all measures are numerical

Quantitative = a *numerical* measure, e.g. percent of plant sales made up by native species or number of lupine plants per plot.

Qualitative = a non-numerical *description*, e.g. open-ended response to a question, such as "What is your attitude towards native plant gardening?" For easier analysis, qualitative information can be made quantitative. For example, the level of stakeholder trust can be recorded as low, medium, or high and then assigned numbers (low = 1, medium = 2, high = 3).

Precision, or **reliability**, refers to how close multiple measurements of the same thing are to one another. Do you need to know a value to several decimal points (23.453 m) or will a less precise measure (25 m) suffice? **Accuracy** refers to how close an estimate is to the true value. This is similar to **validity**, which is how well an instrument measures what it is supposed to measure. If your measurement system is biased (for example, involves estimates made by different data collectors), will that greatly influence your ability to draw conclusions from that information? Look at your question and the expected use column in Worksheet B to answer this question.

Also considering the **time and spatial scale** of your question will help you choose appropriate data. For example, to answer the question of how water temperature has changed over the past ten years, do you need daily, monthly, or annual average measures of temperature?

To determine the accuracy, precision and scale of measurement needed, consider your evaluation *question* and how you will *use* the information acquired. Thinking about how the data will be used in decisions will help to determine the type and specificity of information needed. Refer back to the "uses of the information" column of your **Assessment Framework**.

GIS: Valuable and available

Geographic Information Systems combine layers of information onto a map to give you a better understanding of a place. With this method you can answer a range of questions, from where certain species coexist to where the most burglaries occur. GIS data is often readily available (or can be built upon), as are people with the expertise to help you use it. For more information see the ***Evaluation Sourcebook***.

Being clear on what information you need will allow you to get it most efficiently

Participants in a forest partnership in Colorado wanted to determine whether thinning small diameter trees and reintroducing controlled fire on Forest Service demonstration sites would limit pests, disease, and catastrophic fires. Unfortunately, when the Forest Service financed some of the monitoring work of local researchers, **the researchers failed to clarify what kinds of information and at what detail were required for decision-making.** While the researchers sought "publishable quality" data to validate their research, Forest Service managers needed very basic information to make management decisions. Moreover, while the Forest Service requested information on standing timber for pre and post-burn conditions, researchers collected information on fuel loads and grass-shrub conditions. These differences in the quality of data needed and the kinds of information requested led the Forest Service to develop its own monitoring protocol that was not as time consuming and costly to implement.

If measures of your indicators are not available and/or are not measured with the required accuracy, precision or at the appropriate scale, then you will need to collect them. Be creative and resourceful and keep it *simple*. You will need to consider the questions on data needs above and appropriate methods of data collection.

? Ask yourself these questions to identify how you will measure your indicators:

What kind of measurement will you make?

- ⇨ Will you directly measure or estimate your indicator?
- ⇨ In what units will you measure your indicator and to what degree of precision?
- ⇨ Can your indicator be measured through a photograph or a qualitative description, instead of a more precise or accurate, but more complicated, method?

Where and how often do you need to measure?

- ⇨ What locations or populations are you interested in measuring? How wide of an area do you need to cover?
- ⇨ On what spatial scale do you have to collect the data? Can remotely sensed imagery be used (e.g. to measure stand size), or do indicators need to be measured on the ground (e.g. to measure tree height)?
- ⇨ Is there seasonal variation in your indicator that requires you to measure at specific times of the year? To measure more or less frequently?

A simple alternative: photographs

A professor at the College of DuPage has been working with students over the years to restore a native Illinois prairie. The professor conducted a simple but elegant survey to track improvement of the prairie. He photographed the prairie from the same location on the same day every spring for the last 20 years. It is clear from the photographs that species composition and community structure have changed. For information on photomonitoring techniques see The Nature Conservancy's resource site.

How can you make use of what is known and available?

- Are there widely agreed upon or standardized methods for collecting data on your indicator (such as EPA, DEQ or USGS protocols for measuring water quality)?
- Are there existing data with which you may want to make comparisons at some point (such as GIS datasets upon which you want to build)? How were those data collected?
- Could you make use of established plots or transects that already exist for another purpose?

 **Consult the *Evaluation Sourcebook*,** which provides information on commonly used indicators, as well as information and links to *guidance on sampling and monitoring methods*.

A simple and educational alternative:
Student Erosion Index

Every fall semester since 1995, Williams-Mystic, the Maritime Studies Program of Williams College & Mystic Seaport, has recorded the rate of erosion on the South Shore of Nantucket Island. How? By standing students fingertip-to-fingertip from a large building to the edge of a nearby bluff. This estimate matches the actual distance in meters very closely and can be reported in terms of numbers of students: from 25 to 9 students in six years!"

As you consider your data needs relative to your question, you may refine your choice of indicator. For example, if your question is whether oak savanna quality is improving and one of your chosen indicators is native species diversity, at one extreme you could calculate a diversity index that takes into account the number of individuals of every native species across all of your sites. On the opposite extreme you could simply record the presence of three representative species in five sample plots. Although the latter may not be a good measure of native species diversity, it could be a measure of change in oak savanna quality that adequately informs your management practices and better matches your project's capacity for data collection.

Once you have determined where you will obtain the data you need, or, if not available, how you will collect that information, enter this into the "Information" columns of **Worksheet C**.

Dana Watershed Example: Worksheet C

Question	Indicator and Comparison	Information		Type of Analysis	Responsibilities		
		Data	Source		Collect/ obtain	Store	Analyze/ examine
Is water quality improving?	Index of Biological Integrity (IBI) over last 10 years	Composition & abundance of fish and invertebrates	Dana. College Bio 282 course				

Copy from Worksheet B.

Describe data that will be used to measure the indicator and identify the source of the information.

By the end of this step, you should have identified the information that you will obtain or collect to measure your indicators.

Step 2
What are your analysis needs?

Purpose

Producing or acquiring lots of data is one thing. Using that information to answer a question is another. Analysis is the link between information and answers, and so it is key to go through this step of clarifying *how* you will analyze information in a way that provides the answers you need.

Analysis makes sense of data. It is the link between information and answers.

Analysis includes**:**

- **creating a summary of information,** such as
  - a table of averages
  - a graph of trends over time
- **performing a statistical test,** such as
  - a t-test of the difference between two plots
  - a regression of the relationship between two indicators
- **making a visual assessment**, such as
  - an expert assessment of the change in vegetation in photographs of a prairie
  - a diagram of changes in land use shown on a map

Identifying your analysis needs allows you to determine whether you have the necessary expertise to perform the analyses, or whether you need to **hire or collaborate** with someone who does. It can also reveal how you can answer your questions taking the *simplest approach* possible.

To do:

- ❑ Clarify what knowledge you need to draw out of the information you collect.
- ❑ Determine the level of complexity needed to analyze your data to obtain that knowledge.
- ❑ Enter your analysis needs into **Worksheet C**.

? Ask yourself these questions to clarify what type and level of analysis you need to answer your question:

- If you are using available information, is it already in a form that answers your question?
- Can your question be answered by using expert opinion or consensus of your project members?
- Can you simply summarize the information in a table or graph or do you also need to do *statistical* analysis? (see box on next page)
- What knowledge do you need to draw out of the information you collect?

What knowledge you want to draw out of the information you collect depends on your evaluation question. Consider the examples below to determine ***what it is you want to know from your data***.

A general trend or result. For example,

- How does the average number of visitors to the interpretative center vary over the year?
- What is the range of stream flow rate in each of the project area counties?

A difference between two or more measures (at different places or times). For example,

- Is the satisfaction level of visitors to the interpretative center (measured on a 1-5 scale they complete when they visit) higher now than it was five years ago?
- Is stream turbidity higher in unmanaged sites?

A relationship between two or more factors. For example,

- Does the number of visitors to the interpretative center relate to the number of outreach activities we have held in that year?
- Does the density of riparian trees correspond with lower stream turbidity?

When do you need to use statistics?

Statistical analysis is used to determine if your results are outside of what may be expected to occur *by chance alone*. Often, your results are **obvious** or what you are measuring may be **completely in your control**. In these cases, it is not necessary to determine whether a difference or relationship is "*statistically significant*."

Examples of when you can do without:

- Lupines are present in all burned plots and absent in all non-burned plots (the difference is obvious)
- The number of acres purchased went up only slightly in 2002 (the difference is small, but exact – you know how many acres you purchased)

On the other hand, when differences are **small**, **unclear** or **involve many variables outside of your control**, ***and*** the **cost of making a wrong conclusion** is high, then statistical analysis is merited.

Examples of when you need it:

- Lupines are marginally present in 25% of the burned plots and 35% of the non-burned plots (the difference is not obvious and there are many other variables affecting the results)
- Levels of stream pollutants are slightly higher in hazard-control sites than unmanaged sites (the difference is small, and making a wrong conclusion – e.g. that there is a difference when in fact the difference is due to chance variation – may lead to a change in management that increases pollutants)

Based on your answers to these questions, for each indicator write your analysis needs in the "Type of Analysis" column in **Worksheet C**.

Dana Watershed Example: Worksheet C

Question	Indicator and Comparison	Information		Type of Analysis	Responsibilities		
		Data	Source		Collect/ obtain	Store	Analyze/ examine
Is water quality improving?	Index of Biological Integrity (IBI) over last 10 years	Composition & abundance of fish and invertebrates	Dana College Bio 282 course	Analysis of statistically significant change over time			

Describe data analysis or information processing needs

By the end of this step you should have determined how the information collected for each of your indicators needs to be processed or analyzed in order to answer your evaluation questions.

Step 3
How will the necessary activities be accomplished?

Purpose

Having identified your information and analysis needs, now you need to determine how to get the job done. In this step, you will figure out who will be responsible for the different activities of data acquisition, storage, and processing.

To do:

- Determine who is most appropriate to complete each step of information gathering and use.
- Record responsibilities in **Worksheet C.**

Data collection can be broken down into several manageable activities:

1) **collect** the data *or* make necessary contacts to obtain it;
2) **store** and maintain the data (especially important if data collection will occur over a long time period, for example looking at *trends over time*);
3) **analyze** the data. That is, process, examine, summarize and/or statistically analyze it relative to your question.

Work through each set of questions below, using Worksheet C to fill in who will be responsible for the different tasks associated with each indicator. As you go through these questions certain **capacity issues** will arise: do we have the funds or resources to accomplish these activities? You may find that the same person will accomplish all of the activities, or that additional staff would be helpful.

Keep in mind that including stakeholders, volunteers, citizens and local schools in data collection activities not only cuts the amount of time and money devoted towards evaluation, but also increases local understanding and support of your group's activities.

? Ask yourself these questions to identify who will *collect or obtain* the data:

- Who has experience in collecting that type of data?
- Could data collection be part of someone's job description?
- Does the collection of certain information require someone with expertise or credentials in order for the results to be considered legitimate or credible?
- Who can make contact with the organization collecting the data? Do they need to be contacted regularly, or can an automatic exchange of information be set up?

? Ask yourself these questions to consider how data *storage* responsibilities will be handled:

- Where will the data be stored? Who will be the primary contact?
- How will group members know where to look for data in the future?
- Who is likely to be involved many years from now and could therefore maintain long-term datasets?
- Can the data be publicly accessible (such as through a website), so that other projects may make use of it? Are there data source organizations that could support a web-based version of your data?

How to make data acquisition affordable and time-effective

- Make the most of volunteer and student groups.
- Use data in the *public* domain.
- Set up partnerships with local schools or universities. A regularly-scheduled class could build a long-term dataset.
- Share data collection responsibilities with other organizations, or exchange data for your services or expertise.
- Loan rather than purchase specialized equipment and/or facilities needed for short-term data collection.
- Encourage graduate students of local universities to undertake projects that address your research needs.
- Write funds needed for evaluation into grant requests.

? Ask yourself these questions to consider who will *examine and/or analyze* data:

- What is your level of statistical or spatial analysis expertise? Does your project have staff skilled in analysis, or in using appropriate software?
- If you are obtaining your data from an external source, can they *also* meet your analysis needs?
- How much would it cost to hire a statistical consultant? How does the cost of analysis compare to the cost of pursuing a strategy whose effectiveness is uncertain (that is, are you putting a lot of time and money into strategies for which you are only marginally certain about effectiveness)?
- Do certain analyses require someone with expertise or credentials in order for the results to be considered legitimate or credible? How important to the success of your project is it that the source of results be considered independent?

Use **Worksheet C** to fill in who will be *responsible* for each task and indicator. Writing additional information into the worksheet on how these tasks will be accomplished will further assist you in getting the job done. You and your partners should agree on these issues. *The more people who are aware of their responsibilities, the more likely it is that the plan will be carried out.* Process considerations are as important here as they are in other stages of evaluation. For example, if the stakeholders are concerned that volunteers may not have the necessary expertise to collect certain types of data, then this issue should be resolved before data collection begins.

What about a timeframe? You should try to estimate how long collection and analysis activities will take. However, it will be easier to determine how long they will take once data collection is underway. At that point, return to your Information Work Plan and write in deadlines by which activities should be accomplished. To begin with, you could enter dates when responsible parties should report their progress.

Dana Watershed Example: Worksheet C

Question	Indicator and Comparison	Information		Type of Analysis	Responsibilities		
		Data	Source		Collect/ obtain	Store	Analyze/ examine
Is water quality improving?	Index of Biological Integrity (IBI) over last 10 years	Composition & abundance of fish and invertebrates	Dana. College Bio 282 course	Analysis of statistically significant change over time	Professor Jenn Walker & students	Project website	Professor Jenn Walker & students

Decide who will be in charge of the tasks related to data collection and analysis.

By the end of this step you should have determined who will be responsible for obtaining, storing or managing, and examining or analyzing the data.

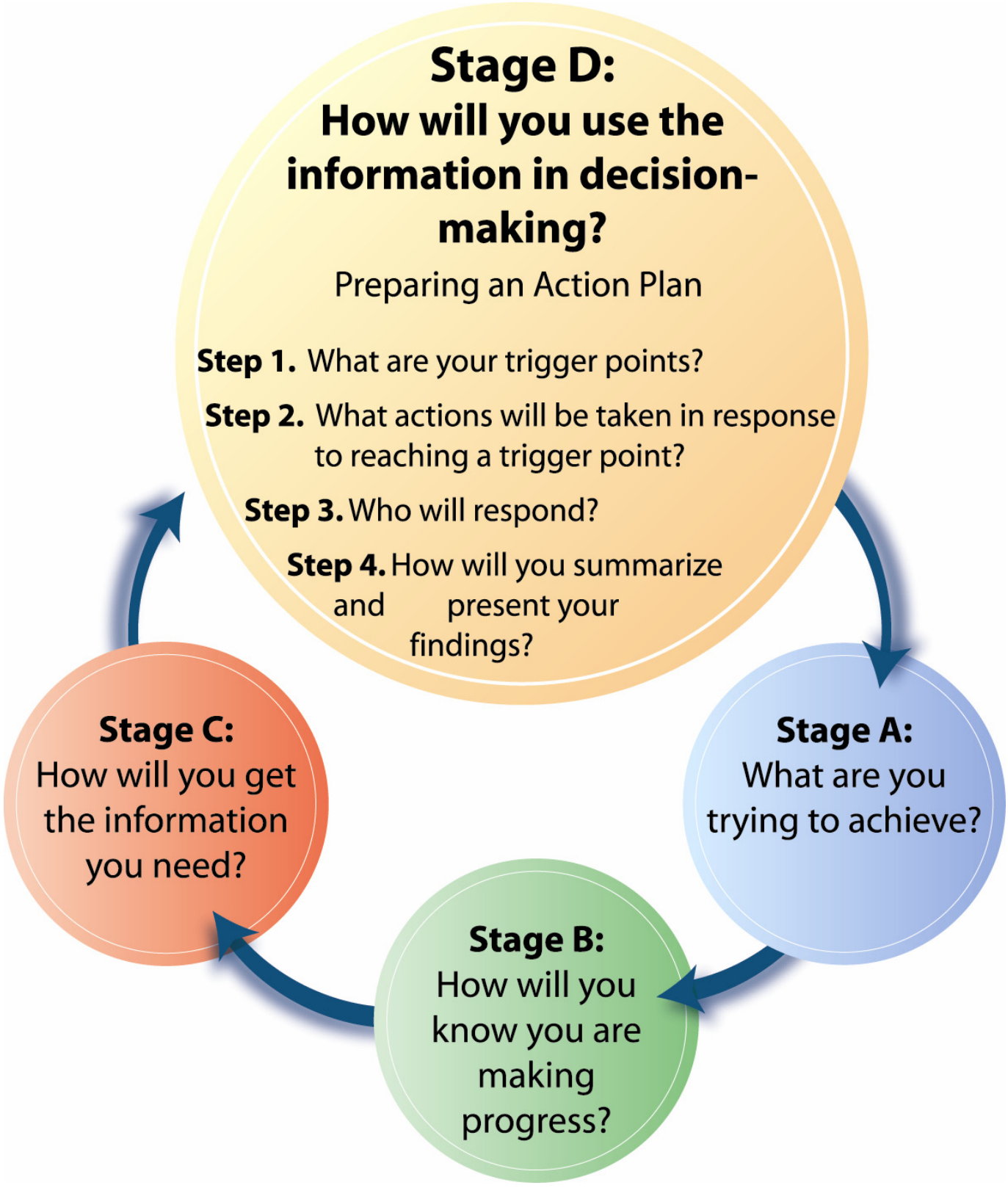
If at this point you have more indicators than you have the time or resources to measure (even taking into account what data are already available), then revisit the list of criteria provided for choosing indicators in Stage B, Step 3. Determine if there are indicators that could be used to answer *multiple* questions. In addition, you can reconsider the number of *questions* you are addressing by reviewing the criteria for "What do you *need* to know?" (Stage B, Step 2).

Dana Watershed Example: Completed Worksheet C – Information Workplan

Question	Indicator and Comparison	Information		Type of Analysis	Responsibilities		
		Data	Source		Collect/ obtain	Store	Analyze/ examine
Is water quality improving?	Index of Biological Integrity (IBI) over last 10 years	composition & abundance of fish and invertebrates	Dana College Bio 282 course	Analysis of statistically significant change over time	Professor Jenn Walker & students	Project website	Professor Jenn Walker & students
How much of the stream bank has been revegetated by volunteers?	# of miles of stream bank where plantings have been completed currently vs. start of project	Aerial photograph	County land planning office	Visual assessment of percent cover	Project vegetation specialist	NA	Project vegetation specialist
How many landowners use existing riparian improvement grants?	% of landowners in the program in Dana vs. Jefferson watersheds	Counts of total and funded landowners	State program records	Table with %'s	Ralph Sweeney, state DNR rep on Dana Board	NA	Project coordinator
Are fish and endangered mussel populations recovering?	Population sizes over time	Population density estimates	State DNR & volunteer monitoring group	Compare #'s in graph	Project coordintator: obtain from volunteer monitoring group & DNR	Dana project database	Project coordinator

Question	Indicator and Comparison	Information		Type of Analysis	Responsibilities		
		Data	Source		Collect/ obtain	Store	Analyze/ examine
Is water diversion an increasing problem for target fish species?	Flow rate over last 20 years	Cubic feet per second – summer months only	USGS gauging station	Statistically compare	On-staff hydrologist	USGS	On-staff hydrologist
Are we protecting existing open space?	# acres in open space currently vs. start of project	Area land use maps	County land planning office	County land planning office has totals	Project vegetation specialist	Project website	Project vegetation specialist
Has conflict eased since the beginning of the project?	Trends over time in # of newspaper headlines reflecting conflict and response to phone survey	Headlines related to Dana River Watershed; response to 5 phone survey questions	Local and regional newspaper archives; Soc 215 students	Graph averages	Project coordinator	NA	Project coordinator
Is salt cedar invasion increasing along stream banks?	Percent-cover of salt cedar in areas with and without active removal	Estimate of salt cedar percent cover	Volunteer data collection along existing transects	Statistically compare	Volunteer group led by project vegetation specialist	Project coordi-rnator	Project vegetation specialist

Stage D


Stage D:
How will you use the information in decision-making?
Preparing an Action Plan
Step 1. What are your trigger points?
Step 2. What actions will be taken in response to reaching a trigger point?
Step 3. Who will respond?
Step 4. How will you summarize and present your findings?
Stage A:
What are you trying to achieve?
Stage B:
How will you know you are making progress?
Stage C:
How will you get the information you need?

Stage D
Creating an Action Plan:
How will you apply new information to decision-making?

Purpose

As the term *evaluation* implies, there must be some clear *value* to collecting information about your project. Staff turnover, intermittent funding, competing project needs, and a host of other factors make it easy to lose track of *why* you are collecting information and how you will use it. In Stage D you will clarify how and when the information you are collecting will be used in project planning and communication. In Step 1, you will establish trigger points for your indicators – that is, values of an indicator that signify the need to make a decision. Step 2 will provide guidance on possible actions you might take in response to a trigger point being reached. Step 3 helps you build accountability into your evaluation plan by identifying who will be responsible for responding to trigger points and making necessary decisions. Step 4 offers suggestions about how to share your evaluation findings with interested parties.

When does it make sense to complete this stage?

It may seem odd to read about ways to act on your evaluation findings **before** you have collected any information, but this is a key time to consider how your findings could be used to improve your project. Indeed, *if you decide that certain information cannot be acted upon, you might decide to lower the priority associated with collecting it.*

It is also helpful to revisit this stage during and after data collection to refine your responses. It is likely you will obtain answers to your evaluation questions at different points in time and therefore you will want to review the options and guidance for action presented in this stage in multiple phases.

Please take a moment now to tear out or copy Worksheet D "Creating an Action Plan," located in the back of the guide. A sample completed worksheet is provided at the end of this Stage.

Step 1
What are your trigger points?

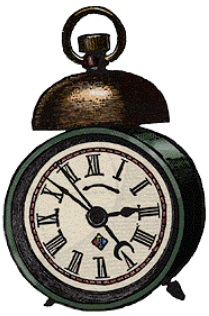
Purpose

A useful way to clarify how the information you are collecting can be applied to decision-making is to establish **trigger points** or thresholds. *Trigger points are predetermined values of an indicator that signify the need to consider action.* Think of them as alarm clocks that beep when its time to wake up.

> ***Trigger point*** = A predetermined value of an indicator that helps you think about whether and when action is needed. Trigger points trigger thought and/or action.

Specifying trigger points for your indicators gives meaning to the information you collect, because it links information with action. For example, assume your average body temperature is 98.6°. When you feel feverish, you may decide to stay at home and get some rest. You may also decide that if the fever reaches 102°, you will go to a doctor. Setting your body temperature trigger points allows you to focus on resting if your fever is mild and to seek medical attention when your fever is above a critical threshold temperature.

Even project members who consistently evaluate their progress work in a climate of *uncertainty*. But actions still need to occur in the absence of perfect information. Establishing trigger points will clarify your role in complex and unpredictable systems, because they enable you to outline contingency plans or *"if-then"* decision points. For example, imagine your group disseminates educational materials on native landscaping to residents near a natural area. A plausible decision your group may set is *if* the percent of non-native plants in gardens is greater than 70% after three years of distributing educational materials, *then* you will adjust your strategy or pursue other ones. Setting a reference value (70%) of your indicator (percent of plants in residential landscapes that are non-native) and a timeline (three years) allows you to build into your strategy a clear point when you will reevaluate the impact of your approach in relation to your objectives and, if necessary, make strategic decisions to pursue new strategies. *Your trigger point shows what level of an indicator is acceptable, and what is not*.



How much and when? It is difficult to determine the exact "right" trigger point. Indeed, you may begin collecting information, realize something about the starting condition or the rate of change, and decide on a different trigger point. Some changes take a long time, and so should have longer trigger point times. On the other hand, setting trigger points that are not reached for many years may mean you *miss key changes* or *waste management efforts*. The impact of some threats may be practically irreversible beyond a point (e.g. levels of a toxic chemical), and so you will want to set trigger points to alert you as soon as possible to these changes (so you take action, for example, before the concentration of certain toxins exceeds critical levels). Especially for strategies that draw heavily on your time and management efforts, you may want to set your trigger points such that minimal time elapses before the trigger is reached, giving you frequent opportunities for re-evaluation of strategy effectiveness.

For many reasons, change is difficult and often resisted. Yet if your current courses of action are not effectively moving you toward your objectives, something should change. *Trigger points specified at the outset of evaluation provide a framework for future discussions and help you avoid conflicts about when action is needed.* Discussing and agreeing on these trigger points is an important part of your project's process.

To do:

- Copy your evaluation questions, indicators and comparisons from Stage C into **Worksheet D**.
- For each indicator, identify your trigger points and write them in the appropriate column of **Worksheet D**.

? Ask yourself these questions to determine trigger points for each indicator:

- What levels of threat or condition are acceptable vs. what levels require a change in action or increased action?
- Are there existing standards or known critical thresholds for the elements you are measuring?
- Can you state a minimum desired level of an indicator that you would want to achieve within a certain time frame?
- Given the nature of the system and topic you are evaluating, when is it reasonable that change will be seen?
- For trigger points related to changes in threats, are there threshold levels of certain threats above which the damage is irreversible?
- What are the boundary levels or amounts of ecosystem features that indicate the system is outside the **range of natural variability** (see ecology section in the ***Evaluation Sourcebook*** for more information)?
- At what point will you need to document to funders or key supporters that your efforts are having an effect?

How to frame a trigger point

A trigger point could take many forms – the key is that it is a meaningful call to action. Some forms include:

- amount per year (rate of change)
- amount within a given time period (e.g. 5 years)
- amount (no time specified – if ever that level is reached, action is required)
- % increase, decrease, or change within a time period (useful if baseline is not known)
- any change at any time (for something you want to remain constant)

Dana Watershed Example: Worksheet D

Question	Indicator and Comparison	Trigger Point	Possible Actions	Who Will Respond
Is water quality improving?	Index of Biological Integrity (IBI) over last 10 years	Lack of any IBI increase by 2004		

Copy your questions and indicators from **Worksheet C.**

Identify your trigger point for each indicator.

By the end of this step you should have listed trigger points for each of your indicators in Worksheet D.

Step 2
What actions will be taken in response to reaching a trigger point?

Purpose

Trigger points allow you to specify a point in time when you feel action should be considered. *But what action?*

In Step 2 you list potential "actions" or strategy changes you might take if you reach your trigger point. For example, if residential landscaping practices do not change as you had expected, you might instead target your education efforts towards nurseries or drop this program and instead allocate resources towards invasive species removal in parks. The list of possible actions you might take may seem overwhelming, however, what you learn in your evaluation of other indicators should help you narrow your options to the most effective actions.

Reevaluate strategies to achieve objectives

Confronting significant water pollution from development, members of the Mianus River Gorge Project in New York invested considerable time and energy to educate local children about pollution. They hoped that the kids' environmental sensitivities would rub off on their parents - the voting public. Over time, they found their strategy did not result in the kinds of substantive public policy changes needed to protect the river. Reflecting on their education strategy and their programmatic strengths they decided to invest their limited resources into educating policy-makers and not just students. The new strategy was more effective, and the group soon worked with local towns to pass new zoning regulations (to modify existing and/or create new water quality protection ordinances and policies) "

An important product of this step is that you will create a list of alternative actions or strategies, broader than your current approaches. *You can then return to this list each time new information or new circumstances (resources, partnerships) allow or force you to consider alternatives.*

To do:

- Identify the courses of action you might take if and when your trigger points are reached. Write this information in the "courses of action" column of **Worksheet D**.

Ask yourself these questions to identify possible courses of action once trigger points are reached:

*If reaching your trigger point means that you **have achieved an important objective**:*

- Can some strategies be stopped or scaled back because you have met your objectives? What level of activity is needed to maintain the current situation?
- Are there side benefits associated with the strategy responsible for achieving the trigger point? (For example, sometimes river monitoring networks have adequate baseline information, but continue frequent monitoring as a way to increase public "ownership" of the resource.)
- If resources become available as a result of your change in activities, how will you allocate these resources?

*If reaching your trigger point means that your strategies **have <u>not</u> achieved the desired outcome (threat reduction or progress towards objectives):***

- Are you accomplishing enough of the planned tasks of that strategy (you may have other indicators that give you this information)?
- Are there alternative strategies that you have not explored?
- Are there threats that are undermining your ability to have an effect?
- Are there other strategies that could be followed to capitalize on a previously unrecognized asset?
- Can you partner with another organization, agency, or business to achieve your objectives?

Deciding on a course of action based on evaluation results can be challenging because different members of your group may have conflicting views about the value of pursuing one strategy over another. However, dedicating some time at the outset of your evaluation to discuss possible course of actions when a trigger point is reached may prove *valuable to future decision-makers who can use the list as a starting point for their deliberations.*

Dana Watershed Example: Worksheet D

Question	Indicator and Comparison	Trigger Point	Possible Actions	Who Will Respond
Is water quality improving?	Index of Biological Integrity (IBI) over last 10 years	lack of any IBI increase by 2004	- conduct or fund an experiment to directly test the effect of riparian buffers on water quality	

Write potential courses of action in response to your trigger point being reached.

By the end of this step you should have listed some potential courses of action for each trigger point established in Step 1.

Step 3
Who will respond?

Purpose

There may be a significant delay between the time you begin your evaluation and the time a trigger point is reached. Over this time frame, your group's composition may change as will the situation in which you work. This dynamism means that intentions to follow a course of action if a strategy fails may be forgotten or discounted in the future.

In Step 3 you will build ***accountability*** into your plan by specifying who will be responsible for making decisions or following through on proposed actions if a trigger point is reached. This ensures that the results of your evaluation will be used in decision-making and the contingent actions you consider feasible will be taken seriously. This person may often be the project coordinator or the chair of the board. In some cases, however, you may want to get *commitment* from another party to respond if new information indicates that they need to change their actions.

"We recently targeted for restoration a four-mile stream segment. Through water quality monitoring, flow monitoring, and walking the stream, we were able to identify where our biggest problems were. Once we carried out restoration on those sites, we were able to monitor them over time to make sure the restoration was effective. Our monitoring data helped us fine-tune our restoration approaches from time to time including the use of rock along riparian corridors. Without evaluation and general trend analysis we would be punting."

- *Alan Rollo, Sun River Watershed*

For example, your group may decide that if prairie burns do not significantly increase the number of butterfly host plants in four years, one participating organization will fund a plant propagation program while another will work with volunteers to plant these species. Now, imagine four years down the road when you learn that the burn program has not worked as planned. Will the organizations stand by their agreement? If not, will they have a reason for not following through (for example, budget shortfalls)? Stipulating who is responsible for doing what once a trigger point is reached will bring greater accountability to your project and ensure that your proposed courses of action will provide a good basis for future decision-making.

To do:

- Specify who will be responsible for decision-making and taking action when a trigger points is reached.
- Write the responsible position and/or organization in the "Who Will Respond" column of **Worksheet D**.

? Ask yourself these questions to determine who will respond:

- ⇨ Are there critical decision makers or opinion leaders who need the information to move forward?
- ⇨ Have any parties made contingent promises to act once a trigger point is reached?
- ⇨ Which job position corresponds with the actions that would be taken? Who is involved in decision making for that specific trigger?
- ⇨ Who is likely to be involved in the project at that time?
- ⇨ Who will control key resources that enable action?
- ⇨ Is there a preexisting decision-making process or organizational structure that can consider the results and decide on whether action is needed? Will their decisions be viewed as legitimate?
- ⇨ Will you need to create a new structure to ensure effective communication and information sharing between people and organizations that should be involved (such as project leaders, scientists, field workers, and volunteers)?

"Who" will take action should not just be a person's name, but a title (position) and organization or entity. This will prevent your evaluation plan from becoming outdated if there is staff turnover.

Dana Watershed Example: Worksheet D

Question	Indicator and Comparison	Trigger Point	Possible Actions	Who Will Respond
Is water quality improving?	Index of Biological Integrity (IBI) over last 10 years	lack of any IBI increase by 2004	- conduct or fund an experiment to directly test the effect of riparian buffers on water quality	on-staff hydrologist

Write in this column who will respond to a trigger point being reached by taking action or making certain decisions.

By the end of this step you should have specified trigger points and associated courses of action and who will be responsible for responding to this situation.

Step 4
How will you summarize and present your findings?

Purpose

In the first few pages of this Guide, you wrote down your goals for evaluation and your key audiences. These goals have informed your choice of evaluation questions and how you have interpreted your results. Step 4 will help you communicate the results of your evaluation in light of your overall goals to partners, funders, and others. **While you can *apply* this step after you have collected and analyzed new information about your project, imagining the products of evaluation *before* data collection may influence how you collect, analyze and organize information.**

The way you choose to present your evaluation results depends on your audience and the scope of your project. Below is a list of communications media options.

- **Report cards** allow your group to highlight a set of indicators that reflect the state of the system in which you work. Report cards are particularly helpful for audiences who will want to track your progress over time.

- **Press releases** allow you to communicate your results to a wide audience through the media, including local newspapers and radio stations. If your results are being framed in a press release, you want to explain why the information is newsworthy and frame it in a way that catches people's attention. Including a quote from a project member or short anecdotes helps enliven the material.

- **Stories** about your project's success or challenges can be particularly useful to help other readers learn from your experience. Presenting the results of your evaluation as a story set in the context of the rest of your project can help others better understand and relate to the complexities of your project and the need to evaluate.

Although your group's communication needs are unique, there is some basic information your group will want to summarize and communicate to others

regardless of the media you chose. Below is a short list of topics to include in a summary of your evaluation findings and the actions you plan to take:

- The purpose of your evaluation
- Individuals or parties involved in the evaluation effort
- The answers to your evaluation questions in light of the trigger points you established
- The actions you will take or continue to follow in light of your evaluation findings

To do:

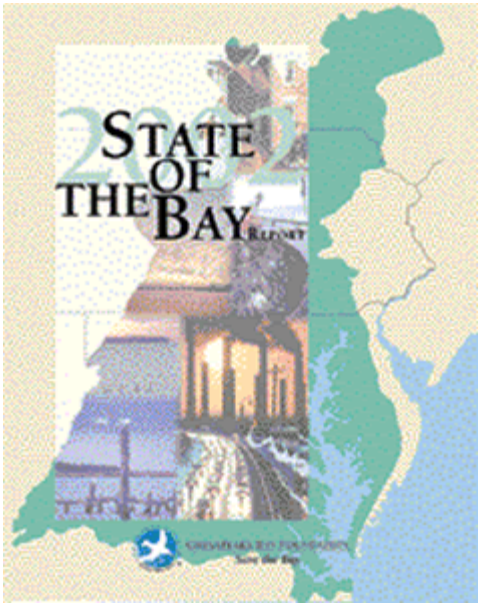
- ❑ Decide how you would present your evaluation results to others.
- ❑ As new information becomes available, or at regular intervals, compose evaluation summaries for your chosen audience(s) highlighting your evaluation questions and answers.

? Ask yourself these questions to think of how you will communicate your evaluation results:

- ⇨ Who is your audience? With whom would you like to share your results (for example, groups working on similar issues, potential funders, the public)?
- ⇨ Does your project already have ways to distribute information, such as a web site, email group, newsletter, or mailing list?
- ⇨ What are some visually attractive and easily understandable ways you could communicate your results to people who are not familiar with your project and your indicators?
- ⇨ How can you relate "bad news" in a way that calls for further action?
- ⇨ Will you carry out frequent or recurring evaluations of your project? If so, are there ways to communicate your results consistently over time (such as over the Internet, etc.), so that others can easily track your progress?
- ⇨ What funds are available to present your findings to others?

The "State of the Bay" report card

Every year, Chesapeake Bay residents look forward to the annual "State of the Bay" report produced by the Chesapeake Bay Foundation (CBF). This report, which highlights the monitoring results of dozens of organizations involved in studying the bay's recovery, communicates the state of the bay in a language that everybody can understand. Monitoring results are organized into three major topics of concern: habitat, pollution, and fisheries. Measuring several indicators against historic benchmarks of the Bay's health, CBF ranks each indicator from one to one hundred. CBF then averages all indicators to derive a single number--the Bay's health score. This report serves not only to raise public awareness, but also provides managers with a clear measure of how close they are to meeting their goals. For more information see http://www.cbf.org/site/PageServer



Communicating what you learn to others is a very rewarding and valuable part of evaluation. It signals to funders and supporters that you are taking a *proactive* approach to achieving project success and it is vital for other projects striving towards similar goals to learn from your experience.

Keeping the evaluation cycle moving forward

Using your evaluation plan

As you begin to implement your evaluation plan you will need to

- **Keep track of your individual evaluation tasks, responsibilities and triggers for action** based on the contents of your Information Workplan (Worksheet C) and Action Plan (Worksheet D).
- **Consult your entire evaluation plan *at regular intervals*** to get the big picture and to make sure trigger points have not been missed. You may do this to ***coincide with reviews of other planning documents***, for example every year or every 5 years. This will keep you on track to completing your evaluation, allow you to adjust it as necessary, and gain the most from it.

Updating your situation map

Once you begin to glean information from evaluation and are triggered into new actions, you can revise the situation map you developed in Stage A. Your new situation map should reflect *what you have learned* about your project, allowing you to engage in future action and evaluation with more knowledge, understanding and effectiveness.

? Ask yourself these questions to update your situation map with new information:

- Have you found that a strategy has even broader effects than you thought (lines to more elements in the map)?
- How has new information changed your perspective of what lines (relationships) are uncertain?
- Do you need to revise or can you confirm which threats or assets have the strongest effects on your system?
- What strategies have you dropped, altered or added? How does that change their relationships with threats, assets and objectives?
- What new questions or uncertainties have become apparent?

Dana Watershed Example: Completed Worksheet D – Action Plan

Question	Indicator and Comparison	Trigger Point	Possible Actions	Who Will Respond
Is water quality improving?	Index of Biological Integrity (IBI) over last 10 years	lack of any IBI increase by 2004	- conduct or fund an experiment to directly test the effect of riparian buffers on water quality	on-staff hydrologist
How much of the stream has been revegetated by volunteers?	# of miles of stream bank where plantings have been completed currently vs. start of project	<40% increase in miles vegetated since start of project	- increase number of volunteer planting events - increase volunteer base	volunteer workdays coordinator
How many landowners use the existing grant programs for riparian area improvement?	% of riparian landowners in the program in Dana vs. neighboring Jefferson watershed	<30% in Dana Watershed OR <25% more in Dana vs. Jefferson watershed	- push county commission to adopt riparian buffer ordinance - survey attendees at educational forums for # applying for grant - lobby DNR to increase funding for buffer grants	project coordinator, Dana Project Board
Are fish and endangered mussel populations recovering?	population sizes over time	< a 20% increase in 3 or more of the species over the last 10 years	- confirm fish passage - put more time and money into water quality improvement strategies	Fish passage working group, Dana project coordinator

Dana Watershed Example: Completed Worksheet D – Action Plan

Question	Indicator and Comparison	Trigger Point	Possible Actions	Who Will Respond
Is water diversion an increasing problem for target fish species?	flow rate over last 20 years	outside the range of natural variability	- consider a water rights purchase program to maintain instream flows	Dana Project Board
Are we protecting existing open space?	# acres in open space currently vs. start of project	>20% decrease in open space over time	- post to website to inform on effects of sprawl - start a purchase of development rights program	project coordinator
Has conflict eased since the beginning of the project?	# of newspaper headlines reflecting conflict among area stakeholders; survey results	lack of improvement over 5 years	- engage in joint situation mapping - hire a more experienced conflict resolution facilitator	project coordinator

BIBLIOGRAPHY

The following is a *sample* of the many resources relevant to the evaluation of ecosystem and community-based projects that aided us in developing the process in this guide. For a more complete list of references and useful web links, visit our web site at http://www.snre.umich.edu/ecomgt/index.htm

General Evaluation

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EPA. 2002. *Community culture and the environment: A guide to understanding sense of place.* U.S. Environmental Protection Agency (EPA 842-B-01-003), Office of Water, Washington, D.C.

Flora, C. B., M. Kinsley, V. Luther, M. Wall, S. Odell, S. Ratner, and J. Topolsky. 1999. *Measuring community success and sustainability: An interactive workbook*, (RRD 180). North Central Regional Center for Rural Development. Ames, Iowa. Available at http://www.ncrcrd.iastate.edu/Community_Success/about.html

Fulbright-Anderson, K., Kubisch, A.C., and Connell, J.P. 1998. *New approaches to evaluating community initiatives*. The Aspen Institute. Washington, D.C.

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Evaluating the Collaborative Process

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Higgs, Steven and Julia M. Wondolleck. 2003. *Objectives and Approaches to Evaluate Process In Collaborative Initiatives: A Literature Review of Existing Frameworks, Methodologies and Recommendations to Measure Process Success*. Ecosystem Management Initiative. Ann Arbor, Michigan. Available at http://www.snre.umich.edu/emi/evaluation/resources.htm

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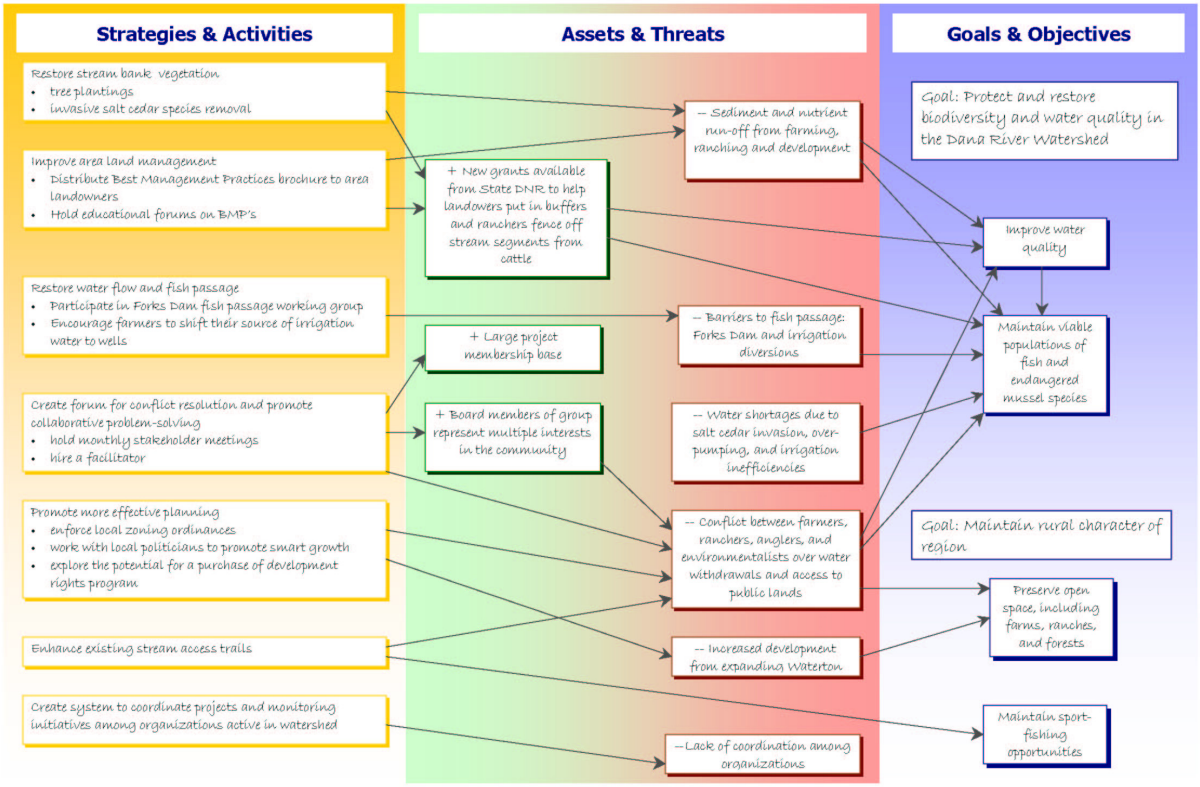
WORKSHEETS

Blank worksheets to help you work through the four stages of the Guide



The following worksheets are also available electronically on the EMI website: www.snre.umich.edu/emi/evaluation.

Getting Started Worksheet

Clarify your purpose for engaging in evaluation

1) List your main reasons for engaging in evaluation; *how* do you expect to benefit?

2) List *who* you expect will benefit from your evaluation activities:

Clarify who will be involved in evaluation

List the people/organizations/agencies who:

1) have an interest in your project's activities and the results of evaluation:

2) are responsible for project decision-making:

3) have evaluation-related experience or expertise:

4) are good project coordinators or enthusiastic leaders or facilitators:

Worksheet A – Creating a Situation Map

Fill in this worksheet as you work through Stage A

Goals	Objectives		Threats (–) & Assets (+)	Strategies and Activities

Brainstorm Sheet B1

How close are we to achieving our objectives?

Brainstorm Sheet B2

Are threats being reduced? Are assets being built upon?

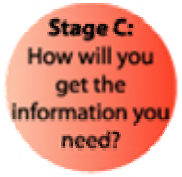
Brainstorm Sheet B3

Are we completing planned activities?

Worksheet B - Assessment Framework

Fill in this worksheet as you work through Stage B

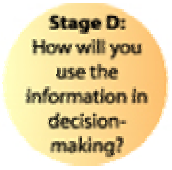
Priority for evaluation	Evaluation Question	Indicators	Comparisons	Uses of the Information



Worksheet C – Information Work Plan

Fill in this worksheet as you work through Stage C

Question	Indicator and Comparison	Information		Type of Analysis	Responsibilities		
		Data	Source		Collect/ obtain	Store	Analyze/ examine



Worksheet D – Action Plan

Fill in this worksheet as you work through Stage D

Question	Indicator and Comparison	Trigger Point	Possible Actions	Who Will Respond