

CHAPTER 2

INITIATION PART ONE:**COOPERATORS AND PROCESSES FOR ROAD PROJECTS****2.1 INTRODUCTION**

Incorporating ecological thinking into all aspects of road design, construction, modification and maintenance is a goal of the transportation community (NRC 2005, Forman and others 2003). The Federal Highway Administration, state departments of transportation, and other federal, state, and county agencies that work with roads seek to meet this goal. One way this goal is being addressed is to integrate issues of native plant revegetation (including protection of existing vegetation) into the larger design and construction processes of road projects. Considering revegetation in isolation from, or as an appendix to, the larger road project is a trend of the past that often resulted in failure. Instead, revegetation planning is an integral part of road planning.

To ensure successful integration of revegetation issues with the overall road project, you need to define the cooperators and agencies involved, know how their processes and timelines work, and get involved at the appropriate times and with the appropriate people. You should expect to be involved in planning and construction processes whenever soil and vegetation disturbances are planned. Agency schedules, milestones, and budgetary issues must be defined to effectively synchronize the revegetation efforts with road development and construction.

Road projects may be administered from local, state, or federal levels, or sometimes from a combination of all three levels. In terms of timing, road projects can be complex and span many years; whereas other projects are streamlined and quick. It is beyond the scope of this manual to cover all the specific procedures and processes for every agency involved in road projects. This chapter, however, provides an overview to successfully navigate the various processes for your project. Your involvement and input is important from the inception

of a project through completion. The earlier you can get involved, the more input you will have. The preliminary steps for initial involvement are:

- Set up recordkeeping
- Identify cooperators: Who is involved?
- Define cooperator processes, timelines, and milestones
- Define objectives: What is the project trying to accomplish?

This chapter provides an overview of each of these steps, followed by a discussion of typical road development processes which include key points of involvement.

2.2 PRELIMINARY TASKS OF INITIATION

Roadside revegetation is a complex process, involving many agencies and individuals. A single revegetation specialist should be appointed to coordinate the planning, implementing, and monitoring/adaptive management of the revegetation aspects of the road project. You may enlist specialists from other natural resource disciplines to help with the revegetation planning so that expertise in botany, soil science, engineering, hydrology, wildlife biology, geology, and ecology is available for the project as necessary. Your role should be the coordinator of the technical and organizational aspects of the revegetation project, as well as the contact between revegetation efforts and the other aspects of road planning and construction.

2.2.1 INITIATE RECORDKEEPING

When initiating a project, it is important to set up a good system for keeping records and documenting the progress. Starting a diary with regular entries of meetings and site visits is a good, basic start. As the project progresses, narratives, data, photos, contracts, specifications, and other information will need to be organized and stored. The diary can begin to serve as a case history for the project. The information will be invaluable when

implementing and later assessing the project. For now, start a folder in the computer (to include all emails and electronic documents), and a folder in the filing system for hardcopies, plan drafts, notes, and a daily journal.

2.2.2 IDENTIFY COOPERATORS AND AGENCIES: WHO IS INVOLVED?

The process for road development will vary depending on the location of the road, which road-related programs and agencies are involved, and the complexity of the project. Interagency cooperation will almost always be part of the process. You must identify the agencies and individuals involved in the road construction project and their respective roles and responsibilities. Especially important is to identify: 1) who is the land owning agency; 2) who maintains the road; 3) who will be carrying out the road construction project; and 4) who is funding the project. All agencies and individuals involved have the responsibility to abide by rules and regulations as they work with the road.

2.2.3 DEFINE COOPERATOR PROCESSES, TIMELINES, AND MILESTONES

Once you have identified the cooperators, you need to understand their processes, timelines, and milestones so you can be involved with the right people at the right time. The timing, responsibilities, and, most importantly, processes associated with each agency will vary. While this may seem complicated, many agencies have a procedural manual that describes how a project is carried out from conception to completion, defining the timelines, milestones, roles and responsibilities, terminology, and how funding works. Locate these documents and agency manuals and use them. Initial meetings are also an ideal time to clarify these processes, when you first begin working with agency personnel.

Each agency has certain approvals and procedural activities, including some that involve fulfilling environmental regulations. You need to define these activities and determine how your work fits with them. The steps in the approval process are often important milestones for the agency, and must be understood so you can be part of decisions while

there is still room for your input. Defining appropriate roles is essential so you can coordinate with the proper people, follow protocols, and avoid duplicating efforts.

Many variables affect the overall timelines from inception to construction. Timelines vary depending on the complexity of the project, the amount of controversy involved, and the availability of funds. Some projects take less than two years, while some can take over ten years. In all cases, the earlier you can get involved in the process, the better opportunities you will have to develop your plan and acquire materials and support you need. This chapter, Figure 2.1, the agency procedural manuals, and your contacts within agencies can help you develop your own schedule and contact list specific to your project. Reviewing Figure 2.1 with the assigned road project engineer and discussing milestones, timelines, procedures, budgets and roles is an effective approach to getting yourself oriented to the complex process of road development.

2.2.4 DEFINE OBJECTIVES: WHAT IS THE PROJECT TRYING TO ACCOMPLISH?

Once you understand the agencies and processes for each phase of the project, you need to understand how your work relates to the overall objectives of the project. Objectives can be found in the programming documents (see below) that originally identified the need for the project. These objectives often center around improving safety or updating the road infrastructure. Phase One of the planning process (Chapter 4) describes how to identify the objectives of the road project and translate them into specific goals for revegetation.

Environmental protection and maximizing the ability of the roadside to regenerate native vegetation will be one goal. The revegetation specialist should be involved when disturbances to soil and vegetation are planned. You are the key link to understanding the potential disturbances that might be caused and how to best minimize or mitigate them. Your input can help planners because you will know what types of disturbances can be feasibly revegetated with native plants. If a disturbance

to soil and vegetation will not allow for revegetation, alternatives to that type of disturbance will need to be considered. Your input is crucial for assessing potential strategies and alternatives. The project objectives also help you determine the types of native vegetation that are most appropriate for your work. Are you working in a wildlife corridor? Is it a scenic drive? Is it an ecologically sensitive area with more intensive recovery needed? Are the slopes very steep?

Recognize that safety, efficiency, and protecting and enhancing environmental health are all important priorities in road projects. While safety concerns may at times limit what is appropriate in roadside revegetation (for example, tall trees along a roadside may be a desirable choice environmentally, but not from a safety or visibility standpoint), these concerns should not be viewed as an impediment to successfully revegetating roadsides. Instead, you simply need to be aware of how your revegetation work can complement safety objectives. Gain an understanding of safety issues, particularly regarding visibility and the ability of drivers to recover if they drive off the road and into the roadside area. (See discussion of how to define roadside revegetation zones in Chapter 3.)

2.3 THE PROCESS OF ROAD DEVELOPMENT

While each road agency will divide up and define

ROADSIDE VEGETATION AND DRIVER SAFETY

Greater safety for the traveling public is the primary objective of many road projects. As the revegetation specialist, you don't want to propose vegetation strategies that might make the roadway less safe. Integrating revegetation goals with safety goals requires an awareness of visibility issues, wildlife interactions, and other factors. Many road developers are interested in the concept of a "forgiving" roadside: a roadside environment that allows a driver to recover safely if they drive off the road into the roadside. Typically there will be a zone adjacent to the road where low grassy surfaces, or shrubs instead of trees, will be desirable for safety reasons. The roadside distance you need to consider to make a roadside forgiving depends on the running speed of highway and the traffic volume. If both of these are high, a forgiving roadside will be a safety priority.

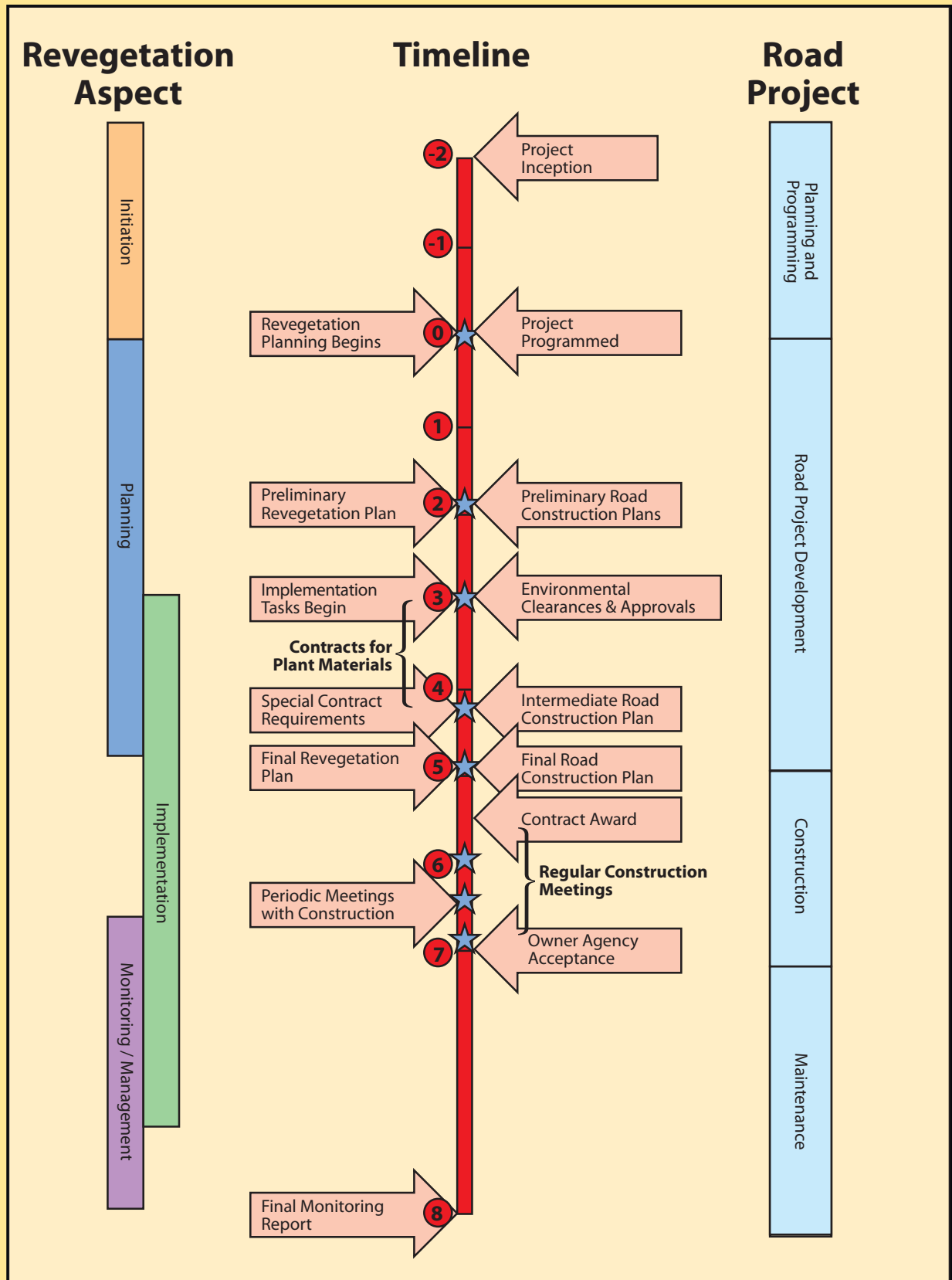
tasks differently, in general the process of road development has four stages: 1) planning and programming, 2) project development; 3) construction; and 4) maintenance. There are many opportunities for integration at each of these phases. For revegetation work, the implementation phase often begins well before road construction begins (with the collection of plant materials for propagation). Revegetation efforts continue after road construction is completed. Figure 2.1 below compares the revegetation process with the overall road development process, showing process steps where interface is crucial. Each of these opportunities for interface is discussed below.

During road project development, a number of meetings will take place involving representatives from the agencies and interests involved with the project. During the planning phase, meetings usually take place at the preliminary, intermediate, and final stages of the road plan. Ideally, the revegetation specialist should attend all these meetings. This ensures that good communication takes place and that trust is built during the road planning process. Meetings also ensure that regulations and requirements are met and that proper channels are utilized to get the job done. During the construction phase, the construction engineer and other key players carrying out the project will probably meet on a weekly basis. Attending some of these meetings is valuable so you can both learn and contribute as the project progresses. Clarify with your key contacts (such as the construction engineer) the most appropriate times to attend meetings. Contractors, inspectors, and other stakeholders may also be at meetings or at the field site at any given time; clarify with your key contact the channels for you to communicate with other individuals who are involved with the project.

2.3.1 ROAD PLANNING AND PROGRAMMING

The process of deciding when to modify or build a section of road is often lengthy. Transportation planners identify and prioritize functional, structural, and safety issues regarding roads. If an issue is becoming problematic, alternatives to address it will be considered (FHA 2005). Once it has been

Fig. 2.1: Coordinating revegetation with the larger processes of road construction is essential. While the timelines and agencies involved will vary, this figure illustrates some of the key opportunities for communication and integration.



determined that a road will be modified or updated, a budget and schedule is created. At this point, the project has been “programmed” for a specific delivery year. This process usually identifies the following: (WFLHD 2005 p. 8)

- “Project purpose and need
- Roles and responsibilities of partnering agencies
- List of project alternatives established
- Primary contacts for project
- Preliminary project delivery schedule with milestones
- Collection and analysis of traffic data (accident history, average daily traffic (ADT) volumes, etc.)
- Preliminary construction cost estimate
- Environmental concerns for the project (cultural and natural resource) and estimation of the affected environment.”

A revegetation specialist will probably not be involved in a project until after it is programmed, although at times one might be called in to assess the feasibility of various alternatives.

2.3.2 ROAD PROJECT DEVELOPMENT

The road project development process begins after the project is programmed and ends when construction begins. Depending on environmental concerns and right-of-way issues, the project development process may take between one and five years.

The road project development phase usually has three sub-phases. These involve developing, analyzing and considering approaches and alternatives to the project until a strategy and specifications of how to best proceed are shared in the final plan. The process usually involves:

- Preliminary (road construction plans 30% complete)
- Intermediate (road construction plans 50%-70% complete)
- Final (road construction plans 70-100% complete, hand off to construction)

2.3.2.1 PRELIMINARY PHASE

The preliminary development phase involves collecting information and initiating contacts with parties who are interested in or affected by the road construction (local and adjacent landowners, resource agencies, regulatory agencies, and any other potentially affected parties). The Preliminary phase is necessary to refine purpose and need, and to develop a range of alternatives to address purpose and need and obtain the approvals and clearances to allow the project to proceed. This includes commitments for environmental mitigation. The preliminary phase takes the road construction plans to about 30% completion. Once approvals and clearances are obtained, funds can typically be committed to continue development of the project.

Usually the Preliminary phase will create:

- Preliminary construction plans (usually drafts about 30% complete) of the proposed alternatives (plan/profile sheets, typical sections, major work items identified and located)
- Preliminary construction cost estimates for alternatives
- Resource surveys (wetlands, archeological sites, and biological assessments)
- Preliminary construction schedule
- Identification of impacts and mitigation
- Environmental approvals and selection of alternatives for implementation
- List of contacts for the project.

For the revegetation specialist, the Preliminary phase is a crucial one. This phase represents the best opportunity for input regarding issues associated with revegetation, including disturbances planned for existing soil and vegetation on the site. Significant features of the preliminary revegetation plan should be incorporated during this road planning phase. By the time of environmental approvals, the vegetative concepts and the necessary commitments of resources and funds should be integrated with the plan, as revegetation will be an important aspect of environmental protection and mitigation. The appropriate level of detail for the revegetation plan during the preliminary phase depends on the project. For the revegetation specialist, environ-

mental guidelines may be predetermined by legislation that specify goals for the project regarding issues of soil stabilization, percent native vegetative cover, and protection of water quality. The revegetation specialist must be aware of these guidelines, and design them into the final revegetation plan. Approvals are key milestones for the revegetation specialist regarding availability of funds to carry out site assessments and revegetation planning work including preliminary mapping and seed collections.

2.3.2.2 INTERMEDIATE PHASE

The next phase of road development moves towards 50-70% completion of the road construction plans. This phase involves refining plans, obtaining right-of-ways and permits, and creating detailed plans and profile sheets. The intermediate set of plans will include major budget items and quantities, information pertaining to environmental concerns (such as erosion control plans), and major elements such as grading, drainage, and other issues defined. At the intermediate stage, the revegetation specialist should be far along in the development of the revegetation plan. Mitigating measures have been

identified for impacted areas and contracts for seed and seedling production have begun. The intermediate set of road plans will include specifications for how the road project will be carried out. These specifications and contract requirements are key tools for the revegetation specialist.

Special Contract Requirements are a key tool for successful revegetation. They enable you to communicate special requirements and expectations for materials or labor with contractors, and to set standards for performance.

2.3.2.2.1 SPECIAL CONTRACT REQUIREMENTS: A KEY TOOL FOR REVEGETATION

In every phase of road development, there are two key components: 1) plans (drawings) and 2) specifications (contract descriptions). The plan sheets are drawings, blueprint-like visual representations of the proposed work as described in Chapter 3. Specifications are standards, provisions, and requirements that each agency provides to contractors or employees to carry out the work. A “special contract requirement” is a type of specification. In general, special or standard specifications are writ-

EXAMPLE OF AN ENVIRONMENTAL REGULATION REQUIREMENT

“Final Stabilization” Regulation (adapted from EPA 2006)

“Final stabilization” means that all soil disturbing activities at the site have been completed and that a uniform perennial vegetative cover with a density of at least 70% of the native background vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures, or equivalent permanent stabilization measures.

“Final Stabilization” (adapted from EPA 2006) means that:

1. All soil disturbing activities at the site have been completed and either of the two following criteria are met:
 - a. a uniform (e.g. evenly distributed, without large bare areas) perennial vegetative cover with a density of 70% of the native background vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures, or
 - b. equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed.
2. When background native vegetation will cover less than 100% of the ground (e.g., arid areas, beaches), the 75% coverage criteria is adjusted as follows: if the native vegetation covers 50% of the ground, 70% of 50% ($0.70 \times 0.50 = 0.35$) would require 35% total cover for final stabilization. On a beach with no natural vegetation, no stabilization is required.
3. In arid and semi-arid areas only, all soil disturbing activities at the site have been completed and both of the following criteria have been met:
 - a. Temporary erosion control measures (e.g., degradable rolled erosion control product) are selected, designed, and installed along with an appropriate seed base to provide erosion control for at least three years without active maintenance or
 - b. The temporary erosion control measures are selected, designed, and installed to achieve 70% vegetative coverage within three years.

ten descriptions of intent, preferred methodology, timing, and standards for accomplishing the work. Standard specifications are uniformly carried out for most projects. Special requirements address context-sensitive concerns for a particular project. Special contract requirements are modifications of existing specifications found within the agency manual, or newly written specifications that are designed to address special concerns not adequately addressed in the standard contract specifications. For example, a standard specification may exist for chipping woody debris, however the standard specification does not address size requirements of the chipped material. For mulch for your project, you may require a uniform size of material that should be shredded and screened, rather than chipped, to create optimal mulch for the project. To meet this requirement, you can create a specification about required size (such as three inches or less in diameter) and processing needs (such as shredded and screened rather than chipped). Careful research is often needed to adequately develop and describe a special contract requirement, but it is essential in order to achieve the desired results in the field. In the future, generically applicable special contract requirements may become adopted as standard requirements if they come to be utilized on most projects.

Special contract requirements are an important tool for revegetation specialists to communicate special expectations with contractors and to set standards for performance. You can specify to contractors what the requirements are, and how requirements might be met, measured, and paid for. Special contract requirements will be part of the contract, not an afterthought. By the intermediate phase, attention should have been given to modifying or creating contract requirements to meet the revegetation needs of the project. When specifications are not available for what you are trying to achieve, you need to be able to describe the work in terms of where, when, what needs to happen. Special contract requirements are included in the final contract for the road construction project.

2.3.2.3 FINAL PHASE

The final set of road plans will include the design elements of the Revegetation Plan, as well as all the details for road construction. Plan sheets and contract specifications will be fully developed. Final cost estimates will be provided along with a comprehensive schedule. The work of the revegetation specialist in developing the revegetation plan, as well as efforts to reduce the construction footprint and protect native vegetation on the project site, will be an integral part of the road construction plan. At this point, finalizing the revegetation plan will be necessary. It is also time to coordinate with contractors and agencies in order to time availability of plants with outplanting windows.

2.3.3 CONSTRUCTION

Following project development, the construction phase begins. Road construction can take one to three years. Sometimes there is a formal milestone when the project is handed off to construction personnel. If so, the construction engineer becomes an essential contact for the revegetation specialist, who may attend some of the weekly meetings that will take place during road construction. The construction phase of a road is completed when there is a formal acceptance of the road by the road owning agency. For the revegetation specialist, implementation and monitoring phases of revegetation may begin before road construction (with ordering plant materials, etc.) and continue following completion of construction.

2.3.4 MAINTENANCE

Following construction of the road, the work of the revegetation specialist will usually continue for an additional one to three years until the revegetation is fully implemented. Also, the activities around monitoring and adaptive management of the establishing vegetation will continue to take place. These types of activities may continue for up to five years after the road construction is complete. The submission of a final monitoring report is the milestone marking the end of the revegetation specialist's efforts on this project. Coordination with the road owning agency and the individuals who carry out road maintenance will be essential to ensure that

native vegetation continues to thrive on the site. For example, the agency taking ownership, often the county, may have maintenance methods that may ultimately undo portions of the revegetation, for example if blanket herbicide use is standard use along roadsides. It is essential to check what maintenance methods are utilized and to coordinate efforts to ensure that management is appropriate for the native vegetation. The transportation agencies will continue to monitor the road to ensure that the problem that led to the road modification (infrastructure decay, safety issues) was adequately addressed by the project.

2.4 NEXT STEPS

Effective integration of revegetation requires an understanding of the key agencies, programs, and relationships involved, as well as how decision processes work to move a road project forward. Successful navigation of the decision processes requires not only technical skills, but an ability to cultivate relationships and get involved at the appropriate times and with the appropriate people. Road construction, alteration, or decommissioning involves a variety of land management agencies, programs, and regulations. Understanding the procedures, timelines, and organizational structure of the agencies involved in a road project is essential in order for the revegetation specialist to contribute effectively throughout the process of road planning and construction. Attending meetings and coordinating with key contacts within agencies are important tasks. The revegetation specialist is usually involved at the beginning when the project is programmed, and continuing through and following construction. It is important to note (as illustrated on the timeline) that the Implementation phase of revegetation begins while the overall project development process is still underway. Waiting until construction begins is not feasible because locally-adapted native plant materials almost always must be propagated in advance. The next step is to acquire the engineering plans for the road and to begin designing for revegetation.