

PLANNING WITH NATURE

Biodiversity Information in Action





Torrey's Mountain Mint (*Pycnanthemum torrei*), photo courtesy of Troy Weldy, New York Natural Heritage Program.

Northern Saw-whet Owl (*Aegolius acadicus*) and **Gray Tree Frog** (*Hyla versicolor*), photos courtesy of Larry Masters, NatureServe.

Delhi Sands Flower-loving Fly (*Rhaphiomidas terminatus abdominalis*), photo courtesy of Marjory Nelson, U.S. Fish and Wildlife Service.

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EXISTING LAWS AND POLICIES AS BIODIVERSITY CONSERVATION TOOLS

Federal and state laws and policies provide many opportunities to evaluate biodiversity information when decisions are made that may cause habitat loss, degradation, or fragmentation. The survey conducted as part of this study reveals that a number of different federal and state laws and policies drive requests for Heritage information. The 40 state surveys considered for this study revealed that the following federal and state laws and policies drive Heritage requests in their states (ranked by the number of states responding affirmatively that the law or policy drives requests): endangered species acts, wetlands laws or regulations, transportation planning laws or policies, environmental impact assessment laws, public land acquisition/open space initiatives, and land use planning and zoning laws (see “Survey Analysis” in Appendix B for further description on survey results).¹³ Floodplain laws or regulations, coastal laws, forestry laws, critical area laws, fisheries laws, and historic preservation laws were also cited, but to a lesser degree (see Table 1).

These authorities are essential biodiversity conservation tools, and states should seize available opportunities to implement them to their fullest potential. To encourage states to take advantage of these opportunities, we discuss how nine of the most commonly cited laws and policies can be used to assess the impacts of state and local-level decisions on biodiversity. For each law or policy, we describe how it is commonly applied by the states and provide an example of how it can be used to require consultation with a state Natural Heritage Program.

ENDANGERED SPECIES LAWS

The federal Endangered Species Act (ESA) is the strongest legal mechanism for protecting species in the United States. Passed in 1973, the act was designed to provide “a means whereby the ecosystems upon which endangered species and threatened species depend may be con-

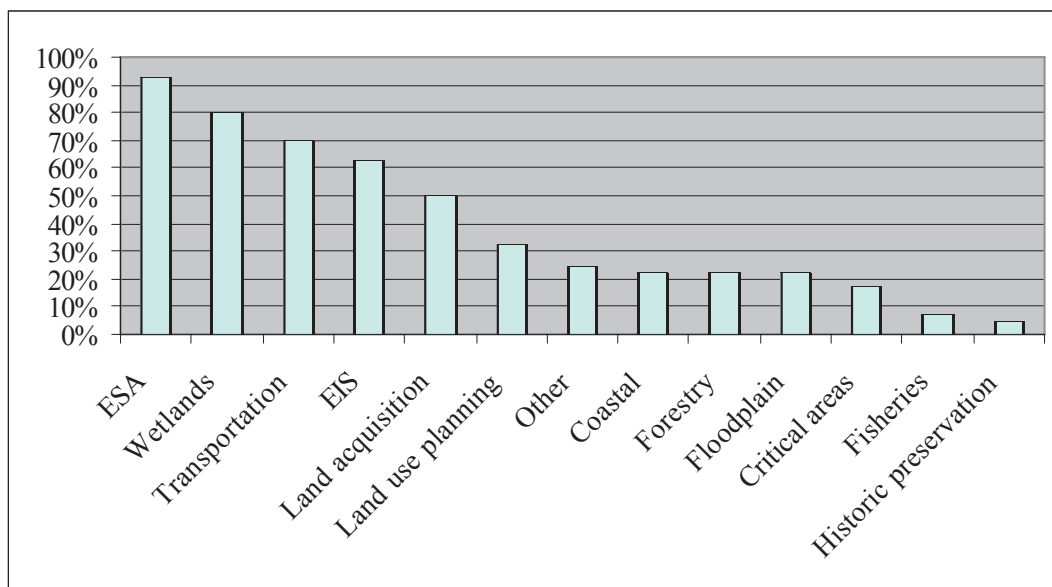


Table 1. Proportion of the 40 responding states that indicated the types of laws and policies driving Heritage data requests in the state. The laws considered are: endangered species laws (ESA); wetland laws/regulations (Wetlands); transportation planning laws/policies (Transport); environmental impact assessment laws (EIS); open space/land acquisition laws/programs (Land acquisition); land use planning laws/programs (Land use planning); coastal laws (Coastal); forestry laws (Forestry); floodplain laws/regulations (Floodplain); critical areas laws (Critical areas); fisheries laws (Fisheries); historic preservation laws (Historic preservation); and other.

¹³The following nine state Natural Heritage Programs did not respond to the survey: Hawaii Natural Heritage Program, Kentucky Natural Heritage Program, Louisiana Natural Heritage Program, Maine Natural Areas Program, Massachusetts Natural Heritage & Endangered Species Program, New Hampshire Natural Heritage Inventory, North Dakota

Natural Heritage Program, Ohio Natural Heritage Database, and the Wyoming Natural Diversity Database. In addition, the response submitted by the Texas Conservation Data Center was incomplete, therefore was not used.

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INTRODUCTION

The loss of our nation's natural heritage is caused, in part, by ill-planned development, poor land use decisions, and land management practices that are incompatible with existing natural habitats. Decision-makers—from state and local government, private industry, and conservation organizations—need more guidance on how to use existing scientific information to assess the potential effects of their decisions on biodiversity. Without informed decision-making, natural resources cannot be effectively protected, even when a decision-maker desires to do so. A survey of decision-makers in New York State—representatives from state, federal, and regional management agencies; land acquisition, planning, and environmental organizations; business and industry; and research institutes—found that almost 90 percent would use additional biodiversity information if it were provided to them in a manner that would serve their needs.¹ The will may exist. State leadership is needed, however, to encourage or require decision-makers to routinely incorporate ecological information into the land use decision-making process. These efforts need to be supplemented by technical support from trained professionals.

Every state has several sources of data that can be used by decision-makers to better integrate biodiversity science into land use planning. But actual use of these data to inform land use decisions that may impact biodiversity varies from state to state. Whether or not states choose to fully utilize the biodiversity data available to them in land use planning may be a matter of expertise, staffing, or political will. This report highlights a broad spectrum of opportunities available to states under existing law and policy to require or encourage the use of biodiversity information in land use decision-making. It offers examples of how biodiversity information is currently being integrated into land use decision-making at the state and local level. And it discusses the many additional opportunities that exist under current federal and state laws and policies to further encourage such integration.

PROJECT GOALS, METHODOLOGY, AND AUDIENCE

For the purposes of this study, biodiversity information is defined as data on the location, status, and life history of native plants, animals, and ecosystems. Because the Natural

Heritage Data Network is the nation's most comprehensive and rigorously reviewed source of information on rare plants, animals, and natural communities, and because some states already routinely turn to their Natural Heritage Programs for assistance on biodiversity-related matters, this study uses Natural Heritage data as a proxy for biodiversity information more broadly.

Natural Heritage Programs exist in all 50 states in the U.S., 11 Canadian provinces and territories, and 11 countries and territories of Latin America and the Caribbean.² Natural Heritage scientists conduct biological surveys throughout their jurisdictions (e.g., state, province, territory, or other governmental unit) to locate populations of rare, unique and imperiled plant and animal species and significant ecological communities. Conservation status ranks (the level of imperilment based on factors such as rarity or threats) help biologists to focus on collecting data for the highest priority species and ecological communities. Where data are sufficient, the quality of a species or ecological community occurrence at a specific location is also evaluated. Data that meet strict quality assurance standards—including data from other agencies and organizations, such as the state wildlife or natural areas programs, biological surveys, or state museums—are then entered into a centralized database for use in decision-making. The Natural Heritage Data System is a regularly updated computer- and map-based storage system. Natural Heritage Programs often publish project-specific studies and regularly updated reports, such as reports on priority rare species.

Private consultants, federal agencies, state departments of transportation, non-profit environmental groups and land trusts, state natural resource agencies, local governments, and others make formal and informal requests to Natural Heritage Programs for biodiversity data. For the most part, these requests are motivated either by a legal requirement or by the desire to help prioritize conservation activities. To assess which laws and policies most directly integrate biodiversity information into land use decision-making, ELI surveyed the Natural Heritage Programs to determine which laws are driving Natural Heritage data requests.

In partnership with NatureServe—the national organization that represents the network of Natural Heritage Programs throughout the U.S., Canada, and Latin America—the Environmental Law Institute distributed surveys to each

¹ Kennedy, Christina M., Elizabeth A. Gordon and Jessica B. Wilkinson. 2001. New York State Biodiversity Needs Assessment. American Museum of Natural History: New York, NY.

² NatureServe. NatureServe's Network of Member Programs. at <http://www.natureserve.org/aboutUs/network.jsp>. (December 2002).

Natural Heritage Program in the U.S. asking for information about the types of requests received and the underlying drivers for these requests. These surveys were complemented by phone interviews with state Natural Heritage Program directors, administrators of the programs that are making data requests, and independent legal research on the laws and policies that serve as examples.

This report is intended to reach two audiences: 1) the community of Natural Heritage program administrators, biologists, and staff; and 2) the state agencies, local governments, and advocacy groups that have influence over those decisions that impact biodiversity. We hope that this infor-

mation will provide Natural Heritage Programs with inspiration on how the data can be used more creatively in their states under existing laws and policies. In addition, armed with model examples of how existing laws and policies can be interpreted more broadly to require the use of Natural Heritage information, we hope that policy-makers will seek opportunities to require or encourage the use of biodiversity information when decisions are made that affect the status of their state's natural resources. A copy of the original survey and a summary of survey results can be found in Appendix A and Appendix B, respectively.

BACKGROUND

Biodiversity is the variety of life and its processes, which includes the abundance of living organisms, their genetic diversity, and the communities and ecosystems in which they occur.³ Maintaining biodiversity is critical for it provides essential food, fiber, fuel, and other products, and ecological services such as photosynthesis, water purification, and flood control. However, biodiversity depends on healthy ecosystems, which are being rapidly degraded and significantly threatened in the United States, as elsewhere.

CAUSES OF BIODIVERSITY LOSS

The primary cause of biodiversity loss in the United States is habitat destruction and degradation, followed by competition with or predation by non-native invasive species.⁴ Habitat destruction is caused by activities such as land conversion for development, road building, water development, outdoor recreation, agriculture, and resource extraction or harvest (e.g. mining and logging).⁵

Short of the direct loss of native habitat, the more subtle effects of habitat degradation and the fragmentation of habitat into smaller patches have severe consequences for biodiversity.⁶ Ecosystem degradation is far more difficult to measure than outright habitat loss. For example, modification of natural stream channels and drainage patterns for agriculture or to control flooding affects terrestrial ecosystems as well as aquatic habitat. The elimination or minimization of natural patterns of disturbance, such as fire or flooding, can also cause habitat degradation.⁷

Habitat fragmentation is a significant threat to biological diversity wherever human activities dominate the landscape. Habitat fragmentation is a process whereby large continuous areas of habitat are reduced in size and separated into discrete parcels. As roads are built, houses erected, and agricultural land cleared, a patchwork of habitat fragments is left behind. The fragments are often isolated from one another by a highly modified landscape that is inhospitable to many native species. While fragmentation often results from a dramatic reduction in the area of the original habitat, it also occurs when habitat is divided by roads, drainage ditches, dams,

power lines, fences, or other barriers to the free movement and migration of plant and animal species.⁸

Non-native invasive species, or exotics, also significantly contribute to the loss of biodiversity. Many species that have evolved in different regions of the world have been intentionally transported by humans or inadvertently introduced through trade and travel. Most introduced species do not become established in their new environments. Yet, because non-native species are transplanted to areas where their natural predators do not exist, they may have a substantial advantage over native species. Non-native species that do establish themselves can greatly influence the species composition of native communities through competition for resources, direct predation, or alteration of the existing habitat such that indigenous species can no longer survive.⁹ The ability of a non-native species to invade a natural community may be further facilitated when landscapes become modified, degraded, and fragmented by humans.¹⁰ Non-native species now comprise approximately 5 percent of the total U.S. continental biota,¹¹ and in some states, almost 50 percent of the total flora.¹²

MAKING THE LINK BETWEEN LAW AND SCIENCE

If biological diversity is to be meaningfully protected, we must ensure that those activities that contribute to habitat loss, degradation, fragmentation, and the introduction of invasive species are avoided, and where unavoidable, minimized. To avoid or minimize impacts, decision-makers must have access to information on the presence and condition of the species and natural communities in a particular location under consideration for potentially damaging activities. To the extent that decision-makers evaluate the impact of their land use activities on biodiversity, Natural Heritage Programs are the most consistent, readily accessible, and comprehensive information source available.

Several states have laws and regulations that require decision-makers to utilize biodiversity information when making land use decisions. Many more states have laws that provide the opportunity to encourage or require this link between

³ The Keystone Center. 1991. *Keystone Dialogue on Biological Diversity on Federal Lands*.

⁴ Wilcove, David S., David Rothstein, Jason Dubow, Ali Phillips and Elizabeth Losos. 2000. "Leading Threats to Biodiversity." Bruce A. Stein, Lynn S. Kunter and Jonathan S. Adams, eds. *Precious Heritage*. 242.

⁵ *Id.* at 245.

⁶ Meffe, Gary K., C. Ronald Carroll and Stuart L. Pimm. 1997. "Global Biodiversity II: Losses and Threats." *Principles of Conservation Biology*. 2nd ed. Sinauer Associates, Inc.: Sunderland, MA. 148.

⁷ Noss, Reed F. and Robert L. Peters. Dec. 1995. *Endangered Ecosystems: A Status Report on America's Vanishing Habitat and Wildlife*. Defenders of Wildlife: Washington, D.C. 48-49.

⁸ Primack, Richard B. 1993. *Essentials of Conservation Biology*. Sunderland, MA: Sinauer Associates, Inc. Publishers; Robinson, Scott K. 1997. "The Case of the Missing Songbirds." *Consequences*. 3(1): 3-15.

⁹ *Id.*

¹⁰ Vitousek, P. C., D'Antonio, L. Loop, and R. Westbrooks. 1996. "Biological invasions as global environmental change." *American Scientist* 84:468-478.

¹¹ Cox, G. 1999. *Alien Species in North America and Hawaii: Impacts on Natural Ecosystems*. Island Press: Washington, D.C.

¹² Rejmanek, M. and J. Randall. 1996. "Invasive alien plants in California: 1993 summary and comparison with other areas in North America." *Madrono* 41(3):161-177.

biodiversity information and land use impacts. Several states also have non-regulatory programs that seek to proactively identify and protect important biological areas before they are slated for development or other impacts. State agencies should seek out and take advantage of opportunities in existing laws and policies to require an analysis of impacts to biological resources from proposed projects. However, it is important to keep in mind that even if this is done—and done well—numerous, small projects that in themselves may not contribute to significant habitat loss, degradation, or fragmentation, may cumulatively have devastating consequences. Ideally, these individual decisions should be made in the context of a landscape or statewide analysis or biodiversity conservation plan.

States can play a strong role in encouraging their agencies, local governments, and others to move beyond the site-based focus of analysis to the landscape scale. Several states,

including Florida, Massachusetts, New Jersey, and Oregon, have completed statewide biodiversity conservation strategies and a fledgling effort is underway in Delaware. In all of these states, Natural Heritage data and other sources of biodiversity information have been analyzed using a map-based approach to develop a statewide blueprint for conserving this public resource. These maps can then be used to help guide a variety of decisions to ensure that future land use activities seek to minimize the loss of essential habitat and connect areas already under protection (see “Moving Beyond the Site-Specific to the Landscape Scale”). Below we provide a variety of examples of how biodiversity information is currently being used under the auspices of existing state laws and policies to analyze the impacts of state decisions on biological resources. In almost every example, taking a landscape-scale approach would further enhance conservation efforts.

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These authorities are essential biodiversity conservation tools, and states should seize available opportunities to implement them to their fullest potential. To encourage states to take advantage of these opportunities, we discuss how nine of the most commonly cited laws and policies can be used to assess the impacts of state and local-level decisions on biodiversity. For each law or policy, we describe how it is commonly applied by the states and provide an example of how it can be used to require consultation with a state Natural Heritage Program.

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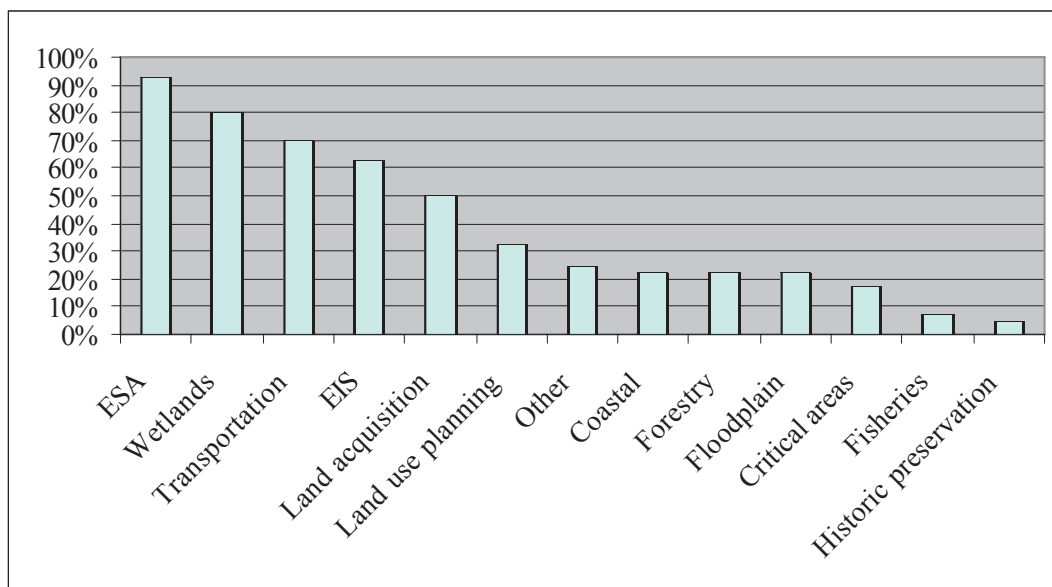


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served.”¹⁴ The act created a program administered by the U.S. Fish and Wildlife Service that identifies at-risk species, lists threatened and endangered species, and then develops and implements recovery plans for those species.

The federal ESA encourages states to adopt their own laws and regulations to protect threatened and endangered species.¹⁵ Under state ESA laws, states may complement the federal act and protect species not listed as threatened or endangered under the federal program. Although, 45 states have exercised this option,¹⁶ most include only very limited provisions to list species and prohibit takings.¹⁷

Previous work by Defenders of Wildlife indicates that to provide the most comprehensive protection, state endangered species programs should have six components: a listing provision, a taking prohibition; a requirement to protect the habitat upon which the species depends; a requirement to develop a recovery plan; agency consultation and an assessment of the impacts on the species; and penalties for violations of the act.¹⁸ A model state program would cover all endangered species and subspecies of animals and plants and would require that decisions on listing, habitat protection, and recovery plan development be based on the best available science. At least 41 of the 45 states with ESA laws have listing requirements that specify that the basis for listing a species should be on scientific criteria. These states, however, may also include considerations of commercial data, public feedback, agency consultation, and “other” data.¹⁹

Of the 40 states that responded to the survey, 37 indicated that a federal or state endangered species act was driving Natural Heritage data requests.²⁰ Nineteen of the 37 states indicated that the federal ESA was driving the requests, whereas 13 states indicated that state endangered species laws were the drivers.²¹ Of the states that ranked authorities, 55 percent (17 states) indicated that ESA drives Heritage requests more frequently than any other law or policy (see “Survey Question 3b” in Appendix B).²²

¹⁴ 16 U.S.C. § 1531(b) (2002).

¹⁵ Center for Wildlife Law and Defenders of Wildlife. July 1996. *Saving Biodiversity: A Status Report on State Laws, Policies and Programs*. Defenders of Wildlife: Washington, D.C. 21.

¹⁶ George, Susan and Ruth Musgrave. Feb. 1998. *State Endangered Species Acts: Past, Present, and Future*. Defenders of Wildlife: Washington, D.C.

¹⁷ *Id.* at 19.

¹⁸ Center for Wildlife Law and Defenders of Wildlife. July 1996. *Saving Biodiversity: A Status Report on State Laws, Policies and Programs*. Defenders of Wildlife: Washington, D.C. 20.

¹⁹ *Id.* at 22-23, 65-201. Arizona, Florida, Georgia, Idaho, and North Dakota do not have listing requirements and Arizona and Georgia do not have separate state ESA laws. The basis for listings in Delaware is up to the discretion of the Division of Fish and Wildlife, Del. Code Ann. tit. 7, § 601.

²⁰ Alabama, Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, Florida, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Maryland, Michigan, Minnesota, Missouri, Nebraska, Nevada, New Jersey, New Mexico, North Carolina, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin. Mississippi, Montana, and New York were the only states that did not indicate that endangered species acts were driving heritage requests.

²¹ Six states indicate that both federal and state laws were driving requests. Eleven states did not indicate whether it was a federal or state ESA driving requests.

²² Arizona, Arkansas, Colorado, Idaho, Illinois, Indiana, Kansas, Maryland, Missouri, Nevada, North Carolina, Oklahoma, Oregon, Utah, Virginia, West Virginia, Wisconsin

California’s state ESAs are the most comprehensive endangered species laws in the nation.²³ They illustrate how requirements for consulting biodiversity information can be incorporated into state law. The state’s ESA laws include several provisions that require the use of scientific information. For example, the Fish and Game Commission may only add or remove species from the endangered and threatened species list based on “receipt of sufficient scientific information.”²⁴ In addition, for an interested person or the Department of Fish and Game to add a species to the list of those that warrant protection under the California Endangered Species Act, the person or department must file a petition with the California Fish and Game Commission.²⁵ The petition must include “sufficient scientific information that a petitioned action may be warranted.”²⁶ The petition also must include “information regarding the population trend, range, distribution, abundance, and life history of a species, the factors affecting the ability of the population to survive and reproduce, the degree and immediacy of the threat, the impact of existing management efforts, suggestions for future management, and the availability and sources of information.”²⁷ The petition must also include information on the species’ habitat requirements and a species distribution map.²⁸

Aside from the act’s listing provision, the law also authorizes the state to acquire land to protect an endangered or threatened species and its habitat.²⁹ The intent of the legislation is to conserve, protect, restore, and enhance these species and their habitat. The act also states that state agencies should not approve projects that jeopardize the continued existence of a threatened or endangered species or those that result in the destruction or adverse modification of habitat if there are reasonable alternatives available.³⁰ Finally, the act sets forth the process that must be taken for developing a recovery strategy for each listed species.³¹ The strategy must include, among other things, an “explanation of scientific knowledge and assumptions regarding the biology, habitat requirements, and threats to the existence of the species.”³²

As demonstrated in California, state endangered species acts provide an excellent opportunity to require the use of biodiversity information when decisions are made that may impact endangered, threatened, or at-risk species. Ideally, states with listing, habitat protection, and recovery plan development provisions should, through regulation or practice, seek to utilize the best available data on the status and

²³ Center for Wildlife Law and Defenders of Wildlife. July 1996. *Saving Biodiversity: A Status Report on State Laws, Policies and Programs*. Defenders of Wildlife: Washington, D.C. 21.

²⁴ Cal. Fish & Game Code § 2070.

²⁵ Cal. Fish & Game Code §§ 2072.3, 2072.7.

²⁶ Cal. Fish & Game Code § 2072.3.

²⁷ *Id.*

²⁸ *Id.*

²⁹ Cal. Fish & Game Code § 2052.

³⁰ Cal. Fish & Game Code § 2053.

³¹ Cal. Fish & Game Code §§ 2109, et. seq.

³² Cal. Fish & Game Code § 2109(c)(1).

habitat of at-risk species. Before making a listing decision, states should consult with the full array of biodiversity information available through their Natural Heritage Program and other credible sources. Such biological data should be the basis for making habitat protection decisions and developing recovery plans.³³ Although ESAs only relate to those species determined to be threatened or endangered, they provide the most direct link between land use decisions and their impact on one aspect of biodiversity.

ENVIRONMENTAL IMPACT ASSESSMENT LAWS

The federal National Environmental Policy Act (NEPA), authorized in 1970, was designed to evaluate the environmental consequences of proposed federal actions and to minimize any potential resulting environmental damage.³⁴ Information about the consequences of proposed actions must be evaluated and weighed against alternatives. The central tool that NEPA uses to accomplish these goals is the Environmental Impact Statement (EIS). When a federal action may have a significant impact on the environment, the lead federal agency must prepare an EIS. In addition to detailing the expected environmental impacts of the project, the EIS identifies several alternatives to the proposed action.³⁵ However, NEPA only requires a weighing of the alternatives and does not mandate that the least damaging alternative be selected.

Building on the federal NEPA requirements, 15 states³⁶ have adopted “little-NEPA” laws that require a similar analysis of the impacts of significant state actions on the environment.³⁷ Little-NEPAs provide an opportunity for states to require an assessment of the potential effects of taxpayer supported, state actions on biodiversity. In addition, state little-NEPAs may go further than the federal NEPA to require that the least damaging alternatives to a project be implemented. An additional 27 states have impact assessment requirements that address only the actions of specific agencies or have minimal requirements for mitigation.³⁸

Of the 40 states that responded to the survey, 25 indicated that a federal or state environmental impact assessment law

drives Natural Heritage requests.³⁹ Although 13 of the 25 states indicated that the federal NEPA was driving requests, 10 states indicated that a state little-NEPA was the driver.⁴⁰ Of the states that provided ranking information, six indicated that data requests received to fulfill requirements under a federal or state NEPA were the primary drivers of data requests,⁴¹ and six indicated that they were the secondary driver.⁴²

Under NEPA laws, the first point at which biodiversity information can help inform land use decisions is when the decision is made as to whether or not an EIS is required. This threshold decision is based on whether or not the proposed action may have a significant impact on the environment. All available sources of biodiversity, including Natural Heritage Programs, should be consulted to make this determination. The second point at which biodiversity information can play a role is when the EIS is prepared and the resources at risk are being evaluated and alternative actions are being developed. Finally, biodiversity information should play a role in determining the level and character of mitigation that may be required to remedy impacts caused by the proposed action. States with little-NEPAs should take full advantage of the opportunities they may provide to require consultation with biodiversity information at these crucial points during the decision-making process.

New York State’s little-NEPA, the Environmental Quality Review Act (SEQR),⁴³ is currently the primary driver of data requests received by the state’s Natural Heritage Program. The law acknowledges that state agencies have an obligation to be “stewards of the air, water, land, and living resources.”⁴⁴ Enacted in 1978, SEQR requires all state and local government agencies to determine whether the actions they directly undertake, fund, or approve may have a significant impact on the environment.⁴⁵

The first step in New York’s SEQR process is the classification of the proposed action to determine whether it is subject to SEQR. For example, an action is likely subject to SEQR review if any state or local agency has authority to issue a discretionary permit, license, or other type of approval for the action.⁴⁶ If the proposed action is subject to the act, the lead agency must complete an Environmental Assessment Form, which is used to determine whether or not the action will have a “significant adverse impact.” The form itself

³³ A national study involving 18 universities recently critiqued the U.S. Fish and Wildlife Service’s endangered species recovery planning process, and indicates that a better application of ecological science would improve the listing process and recovery planning success in the U.S. Ecological Society of America. 2002. Recovery plans for endangered species 12(3): 629-723.

³⁴ 42 U.S.C. §§ 4321-4347 (2002).

³⁵ 42 U.S.C. § 4332 (2002).

³⁶ California, Connecticut, Georgia, Hawaii, Indiana, Maryland, Massachusetts, Minnesota, Montana, New York, North Carolina, South Dakota, Virginia, Washington, and Wisconsin. While some of these states apply the environmental impact evaluation requirements broadly, the majority of these state laws only apply to a narrow subset of state actions.

³⁷ Novick, Sheldon M. and Clark Bordman. Environmental Law Institute, eds. 1987, 2002 update. Law of Environmental Protection. § 7:11.

³⁸ Center for Wildlife Law and Defenders of Wildlife. July 1996. Saving Biodiversity: A Status Report on State Laws, Policies and Programs. Defenders of Wildlife: Washington, D.C. 33.

³⁹ Alabama, Alaska, Arizona, California, Colorado, Connecticut, Florida, Georgia, Indiana, Kansas, Michigan, Minnesota, Montana, Nebraska, New Jersey, New York, North Carolina, Oklahoma, Pennsylvania, South Carolina, South Dakota, Tennessee, Utah, Washington, and Wisconsin.

⁴⁰ Six states indicated that both a federal and state little-NEPA were driving requests, while eight states did not indicate whether it was a federal or state ESA driving the requests.

⁴¹ Arizona, Minnesota, Montana, New York, Tennessee, and Washington.

⁴² Alaska, Florida, Indiana, Kansas, North Carolina, and Utah.

⁴³ N.Y. Evtl. Conserv. Law §§ 8-0101 through 8-0117.

⁴⁴ N.Y. Evtl. Conserv. Law § 8-0103.

⁴⁵ N.Y. Evtl. Conserv. Law § 8-0109.

⁴⁶ New York State Department of Environmental Conservation. Step I. Classifying the Action <http://www.dec.state.ny.us/website/dcs/seqr/seqrsc1.html> (last visited Nov. 15, 2002).

explicitly asks if the project site contains “any species of plant or animal life that is identified as threatened or endangered.”⁴⁷ In practice, New York’s Department of Environmental Conservation’s Division of Environmental Permits (which administers SEQR) directs all applicants to the Natural Heritage Program to answer this question.⁴⁸ The Heritage Program provides applicants not only with data on endangered and threatened plants and animals, but also on natural communities.

If the action meets the threshold definition of having a significant adverse impact, the agency must then prepare an EIS that analyzes environmental impacts of the proposed action and its alternatives.⁴⁹ Under the act, “environment” is defined as “the physical conditions which will be affected by a proposed action, including land, air, water...flora, fauna ...”⁵⁰ SEQR requires the governmental sponsor to identify alternatives to the proposed project, ways to reduce the impacts of the project, or measures to mitigate the impacts of the proposed activity.⁵¹ Actions that are likely to trigger the development of an EIS include the adoption of a municipal land use plan;⁵² municipal zoning regulations;⁵³ changes in allowable uses of a zoning district or granting variances to a zone’s restrictions affecting a certain amount of acreage;⁵⁴ the acquisition or sale of over 100 or more contiguous acres of land by a state or local agency;⁵⁵ and new residential or other developments exceeding a specified size.⁵⁶

SEQR also includes a provision that allows local agencies to designate “a specific geographic area within its boundaries as a critical environmental area (CEA).”⁵⁷ This provision is discussed further in the Special Resource Area Laws section below.

As New York’s SEQR process demonstrates, state NEPAs provide an excellent mechanism to require an evaluation of the impacts of land use activities on biodiversity. Perhaps most importantly, they can provide a direct link between land use planning and zoning decisions and biodiversity. Many of these laws are designed to assess not only the individual proposed activity’s impact, but also the cumulative impacts caused by numerous small projects. Although ideally these provisions would allow decision-makers to assess biological impacts on a landscape scale, (e.g., the project’s contribution to habitat fragmentation), cumulative impact assessments are rarely utilized to their fullest extent.

Federal and state agencies have adopted a number of different statutes designed to protect specific resources deemed to be of significance for biological, ecological, human health and safety, or economic reasons. These include wetlands, floodplains, the coastal zone, and sites determined to be “critical areas.”

WETLAND LAWS

Land development activities that adversely impact wetlands may require a federal or state governmental permit. The primary source of federal regulatory jurisdiction over wetlands is the Federal Water Pollution Control Act, also known as the Clean Water Act (CWA).⁵⁸ The CWA was established to restore and maintain the chemical, physical, and biological integrity of the nation’s waters. The CWA section that established the wetlands regulatory program, § 404, was enacted in 1972. Since that time, § 404 has evolved into the major federal program regulating activities to the nation’s aquatic resources, including wetlands.

Under § 401 of the Clean Water Act, states have the authority to approve, deny, or attach conditions to a federal permit if the permitted activity would violate state water quality standards.⁵⁹ Many states without wetland laws, or wetland laws that only cover a subset of all the state’s wetlands, rely upon § 401 to influence the issuance of § 404 permits. In addition to the federal § 404 and § 401 programs, at least 16 states have comprehensive laws that authorize the regulation of activities that impact wetlands.⁶⁰ Two of these states, Michigan and Pennsylvania, indicated that state wetland laws are the primary driver of requests for Natural Heritage data in their states.

Of the 40 states that responded to the survey, 32 indicated that federal and state wetland laws drive data requests.⁶¹ Of these 32 states, nine indicated that the federal Clean Water Act § 404 and § 401 provisions drive requests and nine states indicated that state wetland laws drive requests.⁶² Three states indicated that wetland laws are the primary drivers of data

⁵⁸ Federal Water Pollution Control Act, 33 U.S.C. §§ 1251-1387 (2002).

⁵⁹ 33 U.S.C. § 1341 (2002).

⁶⁰ Association of State Wetland Managers. State Wetland Protection Statutes. at <http://www.aswm.org/swp/states.htm> (last visited Sept. 4, 2002). The Association of State Wetland Managers identifies the following states as those with programs to regulate wetland resources: Connecticut, Florida, Maine, Maryland, Massachusetts, Michigan, Minnesota, New Hampshire, New Jersey, New York, Oregon, Pennsylvania, Rhode Island, Vermont, Virginia, and Wisconsin.

⁶¹ Alabama, Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, Georgia, Illinois, Indiana, Kansas, Maryland, Michigan, Minnesota, Missouri, Montana, Nebraska, Nevada, New Jersey, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Utah, Vermont, Virginia, Washington, West Virginia, and Wisconsin.

⁶² Sixteen states did not indicate whether it was a state or federal wetland law that was driving requests, and two states indicated that both state and federal wetlands laws drive requests.

⁴⁷ N.Y. Comp. Codes R. & Regs. tit. 6, § 617.20. See Appendix A.

⁴⁸ Telephone Interview with Nick Conrad, Department of Environmental Conservation, New York Natural Heritage Program (Oct. 3, 2002).

⁴⁹ N.Y. Comp. Codes R. & Regs. tit. 6, § 617.1 (c).

⁵⁰ N.Y. Envtl. Conserv. Law § 8-0105.6.

⁵¹ N.Y. Envtl. Conserv. Law § 8-0109.

⁵² N.Y. Comp. Codes R. & Regs. tit. 6, § 617.4(b)(1).

⁵³ *Id.*

⁵⁴ N.Y. Comp. Codes R. & Regs. tit. 6, § 617.4(b)(2-3).

⁵⁵ N.Y. Comp. Codes R. & Regs. tit. 6, § 617.4(b)(4).

⁵⁶ N.Y. Comp. Codes R. & Regs. tit. 6, § 617.4(b)(5).

⁵⁷ N.Y. Comp. Codes R. & Regs. tit. 6, § 617.14(g).

requests⁶³ and 10 states indicated that they are the secondary drivers.⁶⁴

Michigan's wetlands laws drive more requests for Heritage data than do any other laws or regulations in that state. Under a provision of the Clean Water Act, Michigan has "assumed" administration of § 404. As a requirement for assuming the program, Michigan was responsible for developing a wetlands permitting program of an "equivalent scope of jurisdiction" as the federal program. Once such a program has been adopted, the state takes over responsibility for processing § 404 permits.⁶⁵

In order to be eligible to assume the § 404 program, Michigan passed a wetlands permitting program. Under the Michigan Natural Resources and Environmental Protection Act,⁶⁶ the legislature stated that wetlands are a "matter of state concern" since they provide multiple benefits, including, "[w]ildlife habitat by providing breeding, nesting, and feeding grounds and cover for many forms of wildlife, waterfowl, including migratory waterfowl, and rare, threatened, or endangered wildlife species."⁶⁷ The statute states that permits may not be approved unless the Department of Environmental Quality determines that it is "in the public interest, that the permit is necessary to realize the benefits derived from the activity, and that the activity is otherwise lawful."⁶⁸ In determining whether or not the proposed activity is in the public interest, several criteria must be considered, including "[t]he probable impact on recognized ... ecological, or recreational values and on the public health or fish or wildlife."⁶⁹ This provision is the source of many of the wetland-related requests received by the state's Michigan Natural Features Inventory.

Also under the Michigan Natural Resources and Environmental Protection Act, local governments may regulate wetlands of less than two acres through the adoption of an ordinance.⁷⁰ Local governments must approve permits unless they can prove that the wetland is "essential to the preservation of the natural resources of the local unit of government."⁷¹ To prove the essential nature of the wetland, the local government must demonstrate that the site meets at least one of 10 criteria, including the following: "supports state or federal endangered or threatened plants, fish, or wildlife," "represents what is identified as a locally rare or unique ecosystem," "supports plants or animals of an identified local importance," or "provides wildlife habitat by providing breeding, nesting, or feeding grounds or cover for forms of wildlife,

waterfowl, including migratory waterfowl, and rare, threatened, or endangered wildlife species."⁷² This provision provides local governments in Michigan ample opportunity to protect wetlands that provide habitat for wildlife. The state's wetland program and Michigan Natural Features Inventory may, however, need to provide leadership and technical expertise to the localities to enable them to utilize their authority to the fullest potential.

Federal § 401 authority and state wetland laws provide excellent opportunities to evaluate the impacts of proposed wetland-related projects on a state's biological resources. Biodiversity information can play a vital role during several stages in the decision-making process. First, biodiversity information can help inform whether or not a permit should be issued for the proposed activity. If regulators decide that a permit will be issued, but would like to place special conditions on the permit, they should consult all available biodiversity data to ensure that impacts to biodiversity are minimized. Finally, if a permit is issued, but mitigation is required, regulators should utilize biodiversity data to determine what wetland functions or values are being lost through the proposed activity and therefore, the type and level of mitigation required.

FLOODPLAIN LAWS

The National Flood Insurance Program (NFIP) is the basis for much of the management of floodplains in the United States.⁷³ Although managed by the Federal Emergency Management Agency at the national level, NFIP is carried out by almost 20,000 communities across the country. Participating localities may adopt and enforce floodplain management ordinances to reduce future flood damage. In exchange, the NFIP makes federally backed flood insurance available to homeowners and businesses in flood prone communities.⁷⁴

In addition to the federal program, many states have adopted their own floodplain laws and regulations that go beyond the federal minimum requirements.⁷⁵ These programs are carried out at the state and local levels. The Association of State Floodplain Managers has identified 24 states that have riverine standards that are more stringent than those of the NFIP.⁷⁶ Of these, 12 states directly regulate development in the floodway, 18 have local regulations that must meet state requirements, and six allow the state or another agency to carry out regulation or enforcement if the locality fails to do so.⁷⁷ In addition, 36 states have a permit

⁶³ Arizona, Michigan, and Pennsylvania.

⁶⁴ Colorado, Delaware, Illinois, Indiana, Maryland, Tennessee, Utah, Virginia, Washington, and West Virginia.

⁶⁵ 40 C.F.R. §§ 232 et seq., 233 et seq. (2002).

⁶⁶ Mich. Comp. Law §§ 324.101 through 324.90106.

⁶⁷ Mich. Comp. Law § 324.30302(1)(b)(ii).

⁶⁸ Mich. Comp. Law § 324.30311(1).

⁶⁹ Mich. Comp. Law § 324.30311(2)(e).

⁷⁰ Mich. Comp. Law § 324.30309.

⁷¹ Mich. Comp. Law § 324.30309.

⁷² *Id.*

⁷³ Association of State Floodplain Managers, Inc. 1996. Floodplain Management 1995: State and Local Programs. Association of State Floodplain Managers, Inc.: Madison, WI. 20.

⁷⁴ National Flood Insurance Program website, at <http://www.fema.gov/nfip/whonfip.htm> (last visited Nov. 15, 2002).

⁷⁵ Association of State Floodplain Managers, Inc. 1996. Floodplain Management 1995: State and Local Programs. Association of State Floodplain Managers, Inc.: Madison, WI. 24.

⁷⁶ *Id.* at 25.

⁷⁷ *Id.* at 26, Table 6.

review process to regulate the natural resources and functions of floodplains.⁷⁸ Twenty-eight of these states have regulations to protect floodplain habitat,⁷⁹ six states directly regulate development affecting habitat,⁸⁰ three states require localities to meet state requirements,⁸¹ and 17 states have a mix of federal, state, regional, or local standards that govern activities affecting floodplain habitat.⁸²

Nine of the 40 states that responded to the survey indicated that floodplain laws drive data requests.⁸³ One state indicated that federal statutes drive the requests, and five states indicated that either state or local laws drive the requests.⁸⁴ The Indiana Natural Heritage Program indicated that a state floodplain law is the primary driver of Heritage data requests, and two states, Arizona and Michigan, indicated that state and local floodplain laws are the second most common driver of requests of Heritage data.

The state floodplain statute in Indiana is one of the primary drivers of requests for Heritage data. Local governments in the state may establish a floodplain commission to regulate land uses within identified flood hazard areas to assure the promotion of public health, safety, convenience, and the general welfare within its jurisdiction.⁸⁵ The state's statute does not allow activities in or on the floodway that will "[r]esult in unreasonably detrimental effects upon the fish, wildlife, or botanical resources."⁸⁶ This provision provides an excellent opportunity to require the use of biological data to protect the state's natural resources.

In the majority of states, state floodplain laws provide an excellent opportunity to utilize biodiversity information in decisions that affect activities in the floodplain. As noted above, most states have a regulatory role to play in floodplain management and over half of these states have the ability to protect floodplain habitat. Much like with the state wetlands provisions, state and local floodplain laws may allow states to consider biodiversity information when determining whether to issue a permit, condition a permit, and in some cases, may even authorize mitigation for impacts to floodplain habitat.

COASTAL AREA LAWS

The federal Coastal Zone Management Act (CZMA)⁸⁷ includes a provision that requires all federal activities affecting

the state's coastal zone, to be "consistent" with the "enforceable policies" of the state's Coastal Zone Management Plan.⁸⁸ The law applies to the 33 coastal states and territories, which include the Great Lake states.⁸⁹ Federal actions include federal permits (such as § 404 permits), federal licenses and development projects, and federal assistance. States can deny authorization of these federal actions on a case-by-case basis if the state finds that a project is inconsistent with the policies in its approved plan.⁹⁰ In addition to the federal act, at least 12 coastal states have enacted their own coastal zone or shoreline protection statutes that explicitly regulate activities in the coastal zone (these do not include land use planning, wetlands protection, or critical area laws).⁹¹

Nine of the states surveyed indicated that coastal area laws drive Heritage data requests.⁹² Four of these states indicated that a state law was driving requests, and two states indicated that it was the federal statute.⁹³

The Coastal Marshlands Protection Act, for example, is considered one of the primary drivers of routine requests for Heritage data in Georgia. This statute recognizes the role of the state's coastal area and marshes for wildlife habitat.⁹⁴ The law requires a permit for activities that will "remove, fill, dredge, drain, or otherwise alter any marshlands..."⁹⁵ If the project would "unreasonably interfere" with the conservation of fish, other marine life, wildlife, or other resources, the project is considered contrary to the public interest and the Coastal Marshlands Protection Committee may deny or condition the permit.⁹⁶ The Coastal Resources Division routinely consults with the Georgia Natural Heritage Program to determine if there are any heritage elements in the vicinity of proposed projects. This provision provides ample opportunity to protect biodiversity in Georgia's coastal zone.

As with state wetland and floodplain programs, state coastal area laws provide an opportunity to utilize biodiversity information when determining whether or not to issue a permit for an activity that would impact coastal resources, and if a permit is issued, whether or not to place special conditions on the permit.

CRITICAL AREAS LAWS

States may adopt laws to protect geographic areas deemed to be of particular significance or to be particularly sensitive to perturbation. Seven states indicated that special area or

⁷⁸ *Id.* at 52-53, Table 19.

⁷⁹ *Id.* Alabama, Alaska, Arizona, California, Colorado, Connecticut, Florida, Indiana, Iowa, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Jersey, Ohio, South Dakota, Texas, Utah, Virginia, and Wisconsin.

⁸⁰ *Id.* Arizona, California, Florida, Iowa, Louisiana, and Michigan.

⁸¹ *Id.* Colorado, Montana, and Virginia.

⁸² *Id.* Alabama, Alaska, Connecticut, Indiana, Maine, Maryland, Massachusetts, Minnesota, Mississippi, Missouri, Nebraska, New Hampshire, New Jersey, Ohio, South Dakota, Utah, and Wisconsin.

⁸³ Arizona, Connecticut, Georgia, Indiana, Michigan, Montana, New Jersey, Oregon, and Rhode Island.

⁸⁴ Three states did not indicate whether it was a federal or state law driving the requests.

⁸⁵ *Ind. Code* § 14-28-3, 14-28-4.

⁸⁶ *Ind. Code* § 14-28-1-20(2)(B)(ii).

⁸⁷ 16 U.S.C. §§ 1451 through 1465.

⁸⁸ 16 U.S.C. § 1456(c).

⁸⁹ Coastal Zone Management website, at <http://www.ocrm.nos.noaa.gov/czm/welcome.html> (last visited Nov. 15, 2002).

⁹⁰ 16 U.S.C. § 1456(c)(3)(A) (2002).

⁹¹ Coastal Zone Management website, at <http://www.ocrm.nos.noaa.gov/czm/czmsitelist.html> (last visited Nov. 15, 2002). The states include Alabama, Alaska, Connecticut, Delaware, Georgia, Hawaii, Louisiana, Minnesota, Ohio, Rhode Island, South Carolina, and Washington.

⁹² Alaska, California, Delaware, Florida, Georgia, Indiana, Michigan, New Jersey, and Oregon.

⁹³ One state indicated that both federal and state coastal laws drive requests, and four states did not indicate whether it was a federal or state law driving the requests.

⁹⁴ *Ga. Code Ann.* § 12-5-281.

⁹⁵ *Ga. Code Ann.* § 12-5-286(a).

⁹⁶ *Ga. Code Ann.* § 12-5-286(g)(3).

critical area laws drive requests for Heritage data.⁹⁷ Five states indicated that state or local laws drive the requests.⁹⁸

Maryland's Chesapeake Bay Critical Areas Law, for example, was designed to control future land use development along the Chesapeake Bay shoreline to minimize damage to "water quality and natural habitats."⁹⁹ Under the 1984 law, land within 1,000 feet of the tidal influence of the Bay is considered part of the "critical area."¹⁰⁰ In developing their Critical Areas program, the local jurisdiction must provide protection for "those species in need of conservation and threatened and endangered species and their habitats" which occur in the Critical Area.¹⁰¹ The law also requires local jurisdictions to identify and develop a plant and wildlife habitat protection program as an element of their Critical Area program.¹⁰² These protected plant and wildlife habitats include: colonial water bird nesting areas; aquatic areas of historic waterfowl concentration; riparian forests; relatively undisturbed, large tracts of forest that support breeding populations of forest interior-dwelling birds; certain plant and animal communities which are the best examples of their kind in Maryland; and other areas determined to be of local significance.¹⁰³

The Maryland Wildlife and Heritage Service indicates that the third largest driver of requests for heritage data stems from the Chesapeake Bay Critical Areas Law. County planning offices contact the Heritage Program to satisfy their requirement to identify Habitat Protection Areas. Maryland's critical area law affords the state ample authority to regulate sensitive areas in the coastal zone for the purposes of conserving biodiversity.

State critical area laws provide an excellent opportunity for states to proactively protect areas that have been determined to be particularly sensitive or biologically valuable. In states where the authority for designating critical areas is delegated to the local level, it provides local governments with a unique opportunity to protect areas of particular local significance.

TRANSPORTATION PLANNING LAWS AND POLICIES

The federal Intermodal Surface Transportation Efficiency Act (ISTEA), enacted in 1991, was reauthorized in 1998 as the Transportation Equity Act (TEA-21). TEA-21 authorized \$217 billion of funding for state transportation agencies. The law outlines how federal highway funds are distributed and can be used by states. Approved uses include "natural habitat

and wetlands mitigation efforts related to [transportation] projects."¹⁰⁴

Under ISTEA, state agencies are required to engage in two types of transportation planning: the preparation of 20-year Long Range Plans (LRPs) and 3-year Transportation Improvement Programs (TIPs).¹⁰⁵ LRPs outline a set of goals and define a transportation system to meet these goals. LRPs must be prepared with public participation and are revised every three to five years.¹⁰⁶ TIPs contain a prioritized list of the projects that the planning organization expects to be implemented over the next three to five years, and is updated every other year.¹⁰⁷

In addition to authorizing federal funding assistance for traditional highway projects, bridges, mass transit, and other purposes, TEA-21 also includes additional programs that are potentially relevant to biodiversity conservation. The act's Surface Transportation Program (STP) provides funds that may be expended for a variety of activities including mitigation of environmental impacts. At least 10 percent of STP funding is set aside for "transportation enhancements," which are locally developed projects including: wildlife underpasses and environmental mitigation to address water pollution due to highway runoff or to reduce vehicle-caused wildlife mortality while maintaining habitat connectivity.¹⁰⁸ The provision for wildlife and habitat protection was among several additions to the enhancement program made in the 1998 legislation.

ISTEA also provides an opportunity to integrate transportation planning with local land use planning. The law requires regional planning organizations and state departments of transportation to take into consideration state and local land use plans, impacts on air quality and other resources, and efficiencies and trade-offs in siting highways or funding other modes of transportation.¹⁰⁹ The process provides an opportunity for the public to encourage transportation agencies to consider impacts on biological diversity and offers opportunities for restoration and mitigation.

Twenty-eight of the states surveyed indicated that transportation planning drives Natural Heritage data requests.¹¹⁰ Seven of these states responded that requests driven by transportation planning are the second most common source of requests.¹¹¹ Although federal environmental impact assessment, endangered species, and wetlands laws triggered by federal transportation planning requirements likely constitute the majority of these requests, six states indicated that state

¹⁰⁴ 23 U.S.C. 133(b)(11) (2002).

¹⁰⁵ 23 U.S.C. § 135(e), (f) (2002).

¹⁰⁶ 23 U.S.C. § 135(e) (2002).

¹⁰⁷ 23 U.S.C. § 135(f) (2002).

¹⁰⁸ 23 U.S.C. §§ 133(d), 101(a)(35) (2002).

¹⁰⁹ 23 U.S.C. §§ 135, 135.

¹¹⁰ Alabama, Alaska, Arizona, Arkansas, Colorado, Connecticut, Delaware, Florida, Georgia, Illinois, Indiana, Kansas, Michigan, Minnesota, Missouri, Montana, Nevada, North Carolina, Oregon, Pennsylvania, South Carolina, South Dakota, Utah, Vermont, Virginia, Washington, West Virginia, and Wisconsin.

¹¹¹ Arizona, Indiana, Minnesota, Missouri, Montana, Nevada, and Oregon.

⁹⁷ California, Georgia, Indiana, Maryland, Michigan, Oregon, and Washington.

⁹⁸ Two states did not indicate whether a state or federal law was driving the requests.

⁹⁹ Md. Code Ann., Nat. Res. § 8-1801(b)(1).

¹⁰⁰ Md. Code Ann., Nat. Res. § 8-1807(a)(2).

¹⁰¹ Md. Regs. Code tit. 27, § 01.09.03(B).

¹⁰² Md. Regs. Code tit. 27, § 01.09.04(c).

¹⁰³ Md. Regs. Code tit. 27, § 01.09.04(c).

transportation planning provisions are driving the requests.¹¹² Many of these provisions are likely policies, such as cooperative agreements between the state natural resource agency and the state department of transportation, which direct how federally funded transportation projects are identified and executed.

For example, the Illinois Department of Natural Resources (IDNR) and the Illinois Department of Transportation (IDOT) have signed an agreement to guide natural resource review and coordination for transportation projects.¹¹³ The agreement, which applies to all federally funded local projects in the state, requires endangered and threatened species pre-screening before a project is approved. Under this first level of coordination, the IDOT must consult with the Natural Heritage Program to ensure that listed species or Illinois Natural Area Inventory sites do not occur in the vicinity of the proposed project.

Under the next level of coordination, IDOT must review all relevant data, including that from the Natural Heritage database, to determine if proposed projects impact wetlands, streams, forests/trees (including whether or not the project would bisect a forest), prairie/savannas, natural preserves/Natural Area Inventory sites, or threatened and endangered species. If these resources would be impacted by a proposed project, IDOT must demonstrate how it plans to avoid or minimize adverse impacts. The natural resource agency has the ability to accept the conclusions/proposals offered by IDOT, or make recommendations on how to avoid or further minimize impacts.

Illinois' Natural Resource and Coordination Agreement is an excellent example of how a state can help direct and influence federally financed projects to ensure that they minimize impacts to biological resources. The agreement not only requires that the Natural Heritage database be consulted for impacts to at-risk species, but requires an analysis of whether or not an intact forest would be bisected by a proposed project.

From the perspective of biological diversity, transportation planning and funding under federal law provides many important opportunities to analyze the impacts of proposed projects on biological resources. Planning under Long Range Plans and Transportation Improvement Programs and the associated requirements for public involvement may provide one of the best opportunities to proactively address impacts to biodiversity. In addition, state departments of transportation can take advantage of the funding provided under the Surface Transportation Program to minimize impacts from transportation projects and the habitat fragmentation caused by such projects. However, biodiversity information is likely

used more frequently during the NEPA process triggered by federally funded transportation projects.

OPEN SPACE AND LAND ACQUISITION LAWS AND PROGRAMS

Land acquisition—both publicly and privately financed—is viewed as the most effective tool in the conservation toolbox. The most pervasive threats to biodiversity in the United States are habitat destruction and degradation.¹¹⁴ As a result, purchasing land is viewed as the surest way to ensure that biologically important lands are not developed.

Recent trends in public support for open space acquisition demonstrate the importance voters place on stemming the tide of sprawl and protecting biodiversity. This support has manifested itself in a number of successful ballot initiatives to finance public open space programs. In the 2000 elections, 533 measures dealing with open space preservation, transportation investments, and growth management were put to the voters. Nearly half dealt with the preservation of open space in some form and more than 78 percent passed.¹¹⁵ A study by the Land Trust Alliance found that the approved open space protection measures of 2000 would provide \$7.5 billion for land conservation.¹¹⁶ In 1999, voters authorized more than \$1.8 billion in local taxing authority and bonds for open space preservation and in 1998, voters approved approximately \$8.3 billion for open space protection.¹¹⁷

Twenty states indicated that public land acquisition or open space programs drive requests for Natural Heritage data, an indication that biodiversity is a consideration of some programs, even if indirectly.¹¹⁸ Two states, Florida and Indiana, indicated that open space acquisition programs are primary drivers of Natural Heritage data requests.

Florida's land acquisition programs—Preservation 2000 and Florida Forever—provide an example of how biological information can be used to help guide publicly funded land acquisition programs. Preservation 2000 has supported the public acquisition, and protection, of more than 1.25 million acres of land.¹¹⁹ The program was explicitly dedicated to the permanent protection of sensitive lands throughout the state. In 1990, the Florida Fish and Wildlife Conservation Commission initiated a project designed to identify Florida lands that should be protected to meet the minimum long-term conservation needs of most components of Florida's bio-

¹¹⁴ Stein, Bruce A., Lynn S. Kutner, and Jonathan S. Adams. 2000. *Precious Heritage: The Status of Biodiversity in the United States*. Oxford University Press.

¹¹⁵ Myers, Phyllis. Feb. 2001. "Growth at the Ballot Box: Electing the Shape of Communities in November 2000." *The Brookings Institution Center on Urban and Metropolitan Policy*.

¹¹⁶ Land Trust Alliance. 2001. "Voters Invest in Open Space."

¹¹⁷ *Id.*

¹¹⁸ Arizona, Colorado, Connecticut, Delaware, Florida, Georgia, Indiana, Kansas, Maryland, Michigan, New Jersey, New York, North Carolina, Pennsylvania, Rhode Island, Utah, Vermont, Virginia, Washington, and Wisconsin.

¹¹⁹ Florida Department of Environmental Protection website, at <http://p2000.dep.state.fl.us/> (last visited Nov. 15, 2002).

¹¹² Three states indicated that federal requirements drive requests, and 19 states did not indicate whether it was a federal or state provision driving the requests.

¹¹³ Illinois Department of Transportation and Illinois Department of Natural Resources. July 26, 1996. "Natural Resource Review and Coordination Agreement Between IDNR and IDOT." Springfield, IL. available at <http://www.dot.state.il.us/blr/manuals/cl1996-14.pdf> (last visited Nov. 15, 2002).

diversity. The results were published in a 1994 agency report entitled, *Closing the Gaps in Florida's Wildlife Habitat Conservation System*,¹²⁰ which was used to help guide land acquisition under the program.

In 1999, the Florida Legislature approved the Florida Forever program as the successor to Preservation 2000. The program allocated \$3 billion through bond issues over 10 years to purchase significant lands for conservation and water resources projects.¹²¹ Although both programs emphasized acquiring lands for their biodiversity values, the new program places a greater emphasis on other values. Florida Forever now allocates funding to a diversity of areas including, water supply and development projects, public recreation, and urban open space.¹²²

In the Florida Forever legislation, the state legislature made clear that it wanted greater accountability for the program, such as better acquisition priorities and clearer measures of success.¹²³ Projects funded under the new program must contribute to eight goals, including increasing “the protection of Florida’s biodiversity at the species, natural community, and landscape levels.”¹²⁴ The law provides the following benchmarks to measure progress toward the biodiversity goal:

1. The number of acres acquired of significant strategic habitat conservation areas;
2. The number of acres acquired of highest priority conservation areas for Florida’s rarest species;
3. The number of acres acquired of significant landscapes, landscape linkages, and conservation corridors, giving priority to completing linkages;
4. The number of acres acquired of underrepresented native ecosystems;
5. The number of landscape-sized protection areas of at least 50,000 acres that exhibit a mosaic of predominantly intact or restorable natural communities established through new acquisition projects or augmentations to previous projects; or
6. The percentage increase in the number of occurrences of endangered species, threatened species, or species of special concern on publicly managed conservation areas.¹²⁵

In response, the Florida Natural Areas Inventory developed a comprehensive needs assessment for the state in 2002—“Florida Forever: Conservation Needs Assessment.”¹²⁶ The

assessment provides baselines to inform program priorities, identifies priority lands to meet conservation needs, provides a continuous monitoring mechanism for re-evaluating conservation needs, and sets up a mechanism to track and document the progress of the program.¹²⁷

In practice, the Florida Natural Areas Inventory is central to the state’s procedure for selecting sites for acquisition. Every six months, the state reviews the land acquisition proposals received from private individuals, realtors, state agencies, land trusts, and others. In the initial review stage, the primary source of information for evaluating proposals is provided by the Natural Areas Inventory. The program provides a detailed evaluation of each proposal based on the Heritage database, photo evaluation, and other sources. Based on this information, the council that oversees the acquisition decisions selects those projects that will receive full evaluation. Under the full evaluation process, individuals from several different state agencies conduct site visits. Natural Areas Inventory staff surveys each property. Although the Heritage Program takes the lead in characterizing the tract and its biological resources, other factors, such as historical resources, fish and wildlife resources, water quality resources, and recreational resources are also considered.

Publicly funded land acquisition programs provide one of the best opportunities for states to utilize biodiversity information to protect and preserve biological resources on a large scale and over the long-term. In most cases, biodiversity data are used on a case-by-case basis to evaluate proposed land acquisition projects. At a minimum, these evaluations should be encouraged. Although purchasing land is of vital importance for biodiversity conservation, how lands are protected is of equal significance. Protecting small patches of land that are separated by large distances from other habitat patches may do little to protect biodiversity. Protecting lands adjacent or connected to larger protected areas or purchasing lands that link existing preserves and parks can help piece together the biological fabric of the landscape. States that have developed statewide maps identifying critical areas for conservation—including Florida, Massachusetts, New Jersey, Oregon, and a fledgling effort underway in Delaware—are in the best position to ensure that state funds are utilized to achieve the largest conservation gains.

Few existing open space programs explicitly seek to strategically acquire lands in a biologically meaningful manner. The majority of public open space acquisition programs focus on providing citizens with recreational opportunities (e.g., parks, playgrounds) and creating greenways (often paved and with little benefit to wildlife). Of the states surveyed, 29 indicated that they have publicly funded land acquisition programs. However, only 13 of these states indicated that Natural Heritage data are used systematically to

¹²⁰ Florida Department of Environmental Protection website, available at http://www.florida-conservation.org/oes/habitat_sec/Closing_Gaps.pdf (last visited Nov. 15, 2002).

¹²¹ McElfish, Jr., James M. and Ryan Hamilton. 2002. “Smart Links: Turning Conservation Dollars into Smart Growth Opportunities.” Environmental Law Institute: Washington, D.C.

¹²² Fla. Stat. ch. 259 § 105(4)(c-h).

¹²³ Knight, Gary, Amy Knight, and Jon Oetting. Dec. 2000. “Florida Forever: Conservation Needs Assessment.” Summary Report to the Florida Forever Advisory Council. Florida Natural Areas Inventory.

¹²⁴ Fla. Stat. ch. 259 § 105(4).

¹²⁵ Fla. Stat. ch. 259 § 105(4)(b).

¹²⁶ Knight, Gary, Amy Knight, and Jon Oetting. Dec. 2000. “Florida Forever: Conservation Needs Assessment.” Summary Report to the Florida Forever Advisory Council. Florida Natural Areas Inventory.

¹²⁷ *Id.* at 2-3.

help guide land acquisition decision-making. Fourteen states indicated that although Heritage data are not used systematically to guide land acquisition decision-making, the data are used sporadically or on a case-by-case basis. Two states with open space land acquisition programs do not use Natural Heritage data at all (see “Survey Question 5a” in Appendix B for further explanation).

COMPREHENSIVE LAND USE PLANNING AND ZONING

Comprehensive land use planning and zoning carried out by local governments can be used to guide biodiversity conservation and minimize habitat loss and fragmentation. In most states, the legislature has delegated the authority to conduct planning and to adopt zoning ordinances to local governments (e.g., counties or municipalities). Whether planning and zoning are explicitly required, or simply authorized, differs from state to state. State legislatures usually determine what elements local governments can or must include in their comprehensive plans.

Comprehensive planning is mandated in 24 states, and in at least four states local plans must go through a state certification process.¹²⁸ Comprehensive plans do not regulate development activities, but establish the framework for both regulatory and non-regulatory decisions concerning development and growth. They enable local governments to proactively determine how and where they would like development to occur. Where planning is mandated, states can better ensure that local decisions conform to state priorities. After a local comprehensive plan is developed, localities then enact regulatory tools—zoning and subdivision regulations—to implement the plan.

States can include requirements for analyzing the impacts of proposed land use decisions on biodiversity in their land use planning and zoning laws. For example, they may require that comprehensive plans include a natural resource element and that in developing this portion of the plan, they must consult with all available sources of biodiversity data in the state, including the Natural Heritage database. Requiring these considerations when localities develop comprehensive plans would help to ensure that critical biological resources are evaluated proactively, rather than reactively during site-specific project review. A 1996 study, however, found that Heritage data is more frequently used for local review of proposed projects, than for comprehensive planning.¹²⁹

In most states, improving the use of biological information in land use planning and zoning will require the development of innovative outreach programs by the state planning agency or natural resource agency, including Natural Heritage

Programs (see “Non-Legal Mechanisms—Voluntary Outreach Approaches”).

To date, no states have adopted land use laws that explicitly require local governments to conserve biodiversity.¹³⁰ However, many existing laws provide ample authority for local governments to do so. In 13 of the 40 responding states, Heritage Programs indicated that land use planning laws drive requests for data.¹³¹ Of these states, three—Arizona, Delaware, and Vermont—indicated that land use laws are the primary drivers of requests for Natural Heritage data.

Ten of the 40 states that responded to the survey indicated that a state law or policy requires the use of heritage information in state or local land use planning.¹³² The majority of these states indicated that this analysis is required under a state endangered species law, natural areas law, coastal regulation, or landfill citing provision. Only four of these states—Oregon, Rhode Island, Vermont, and Wisconsin—indicated that a state land use law requires some analysis of the impacts of land use decisions on areas of significant ecological value. However, only Rhode Island indicated that this analysis explicitly requires the use of Heritage data (see “Survey Question 6” in Appendix B).

Vermont’s Act provides several provisions that have been interpreted to directly require consultation with the state’s Nongame and Natural Heritage Program in the land use decision-making process. The Act dictates that before granting a permit for subdivision or development, the environmental board or district environmental commission must demonstrate that the project will not have undue adverse effects on ten criteria.¹³³ One of these criteria—criterion eight—states that the proposed activity “[w]ill not have an undue adverse effect on the scenic or natural beauty of the area, aesthetics, historic sites or rare and irreplaceable natural areas.”¹³⁴ The state has interpreted this criterion to mean that proposed subdivisions or developments may not impact significant natural communities or landscapes with a number of significant natural communities.¹³⁵ A subsection, 8a, addresses the proposed project’s effect on “necessary wildlife habitat and endangered species,”¹³⁶ defined as “concentrated habitat which is identifiable and is demonstrated as being decisive to the survival of a species of wildlife at any period in its life including breeding and migratory periods.”¹³⁷ Vermont has supported the use of Natural Heritage data in the evaluation of these wildlife and habitat-based criteria.

¹³⁰ Environmental Law Institute and Defenders of Wildlife. In press. *Planning for Biodiversity: Authorities in State Growth Management Laws and Land Use Planning Enabling Legislation*.

¹³¹ California, Colorado, Delaware, Georgia, Indiana, Kansas, New Jersey, Oregon, Rhode Island, Tennessee, Vermont, Washington, and Wisconsin.

¹³² Connecticut, Illinois, New Jersey, New York, Oklahoma, Oregon, Rhode Island, Vermont, West Virginia, and Wisconsin.

¹³³ Vt. Stat. Ann. tit. 10, § 6086.

¹³⁴ Vt. Stat. Ann. tit. 10, § 6086(8).

¹³⁵ Telephone Interview with Robert Popp, Vermont Nongame and Natural Heritage Program (Oct. 3, 2002).

¹³⁶ Vt. Stat. Ann. tit. 10, § 6086 (8)(a).

¹³⁷ Vt. Stat. Ann. tit. 10, § 6001 (12).

¹²⁸ Meck, S., ed. 2002. *Growing smart legislative guidebook: model statutes for planning and the management of change*. American Planning Association: Washington, D.C.

¹²⁹ Cort, Cheryl A. 1996. “A Survey of the Use of Natural Heritage Data in Local Land-Use Planning.” *Conservation Biology*. 10(2): 632-637.

Delaware requires an analysis of conservation lands in the development of county comprehensive plans. Each county's planning agency is required to prepare a comprehensive development plan that is updated every five years.¹³⁸ Zoning regulations adopted by Delaware counties must be in accordance with the comprehensive plan.¹³⁹ Planning at the municipal level is permitted, but not mandated. Comprehensive planning in Delaware is intended, among other purposes, to "preserve, promote, and improve the public health, safety, comfort...and general welfare," as well as to "conserve, develop, utilize and protect natural resources."¹⁴⁰

A conservation element must be included in county comprehensive plans, and must be developed in consultation with and reviewed by the state agriculture and natural resource agencies to ensure it will achieve "the conservation, use and protection of natural resources in the area and ...[result] in the identification of these resources."¹⁴¹ The conservation plan must include, at a minimum, the classification of natural areas, including "wetlands, wooded uplands, habitat areas..."¹⁴² The county plan must also include a specific future land use plan that includes designation of land for conservation.¹⁴³ The recreation and open space element of the plan, which includes the identification of nature preserves, is an obvious tool for habitat protection and planning.¹⁴⁴ Although Delaware's land use planning laws do not require local governments to protect biodiversity, they clearly provide them with the authority to develop comprehensive plans and zoning tools that consider biodiversity. Whether or not they use this authority, and to what degree, is a matter of political will and leadership.¹⁴⁵

In 2002, Delaware's Natural Heritage Program launched a new initiative—Delaware BioLegacy. Based on a similar approach applied in Massachusetts,¹⁴⁶ the project seeks to identify the areas most in need of protection in the state and graphically depict the data. The information will be of great value to state and local governments and non-profit organizations seeking to protect biodiversity through land use planning and zoning, land acquisition, regulation, or incentives for private landowners.

Land use planning and zoning at the local level is a critical point of intervention for protecting biodiversity and minimizing habitat loss and fragmentation. Seemingly incremental decisions about how land is developed and the pattern of that development may have a greater impact on biodiversity than any other type of land use decisions. Although local land use planning and zoning can be a powerful conservation tool, the level at which localities conduct planning and enact regulations may not be at a scale compatible with conservation planning. Statewide or regional efforts to identify critical habitats and links between habitats should ideally guide local decision-making. Short of a plan set forth by the state, local governments should be required or encouraged through incentive programs to make their planning decisions on a landscape level. Although few states provide this authority and none require regional coordination explicitly for conservation purposes, some states do provide authority for regional planning that could be used for biodiversity conservation purposes.

MOVING BEYOND THE SITE-SPECIFIC TO THE LANDSCAPE SCALE

States can play a strong role in encouraging its agencies, local governments, and others to move beyond the site-based focus of analysis to the landscape scale. State laws and policies provide many opportunities for decision-makers to utilize biodiversity information to help guide decisions about how land will be used and managed. For the most part, these decisions will be made on a case-by-case, site-specific basis. Although this approach is preferable to its alternative—making decisions without any understanding of its impacts on local biodiversity—decision-makers would be in an even better position to contribute to biodiversity conservation if these decisions were made in the context of a landscape or statewide biodiversity conservation strategy. Below are two examples of how existing laws and regulations can be or are being used to protect biodiversity on a landscape scale. In the first, a provision in New York's little-NEPA law, SEQR, provides the state with an excellent opportunity to provide municipalities with biodiversity information to make landscape-scale decisions. In the second, New Jersey's Landscape Project is being used to help guide regulatory decision-making under the state's new freshwater wetlands protection rules.

New York's SEQR law and regulations include a provision that allows local governments to designate sites that have been determined to have "exceptional or unique environmental characteristics."¹⁴⁷ If a proposed activity may impair a Critical Environmental Area (CEA), there is an automatic presumption that the activity may have "significant adverse

¹³⁸ Del. Code Ann. tit 9, §§ 2660(a), 4960(a), 6960(a).

¹³⁹ Del. Code Ann. tit 9, §§ 2603(a), 6904(a), 6907(a).

¹⁴⁰ Del. Code Ann. tit. 9, §§ 2651(a), 4951(a), 6951(a).

¹⁴¹ Del. Code Ann. tit. 9, §§ 2656(g), 4956(g), 6956(g).

¹⁴² Del. Code Ann. tit. 9, §§ 2656(g)(4), 4956(g)(4), 6956(g)(4).

¹⁴³ Del. Code Ann. tit. 9, §§ 2656(g)(1), 4956(g)(1), 6956(g)(1).

¹⁴⁴ Del. Code Ann. tit. 9, §§ 2656(g)(5), 4956(g)(5), 6956(g)(5).

¹⁴⁵ Wilkinson, Jessica B., Shi-Ling Hsu, Brian Rohan, David Schorr, and James McElfish. 1999. "Protecting Delaware's Natural Heritage: Tools for Biodiversity Conservation." Environmental Law Institute: Washington, DC.

¹⁴⁶ Spearheaded by the Massachusetts Executive Office of Environmental Affairs, the Natural Heritage Program developed the BioMap to identify the areas most in need of protection in order to protect the native biodiversity of the state. BioMap focuses primarily on state-listed rare species and exemplary natural communities. The goal of the BioMap is to promote strategic land protection by producing a map showing areas, that if protected, would provide suitable habitat over the long term for the maximum number of the state's terrestrial and wetland plant and animal species, and natural communities. See BioMap, available at <http://www.state.ma.us/dfwele/dfw/nhesp/nhbiomap.htm> (last visited Nov. 15, 2002).

¹⁴⁷ N.Y. Comp. Codes R. & Regs. tit. 6, § 617.14(g)..

¹⁴⁸ N.Y. Comp. Codes R. & Regs. tit. 6, § 617.7 (c)(1).

¹⁴⁹ N.Y. Comp. Codes R. & Regs. tit. 6, § 617.14 (g)(1).

impacts on the environment.”¹⁴⁸ To be designated a CEA an area “must have an exceptional or unique character”¹⁴⁹ including “fish and wildlife habitat, forest and vegetation, open space and areas of important aesthetic or scenic quality”¹⁵⁰ or “an inherent ecological... sensitivity to change that may be adversely affected by any change.”¹⁵¹ Currently, 184 CEAs have been designated in the state. The majority of the sites are located on Long Island and in lower Hudson Valley.¹⁵²

SEQR provides a unique opportunity for local governments in New York to utilize biodiversity data to identify areas within their boundaries that may warrant additional protection. Localities could maximize the ability of this law to serve biodiversity by working together to identify these areas on a regional or landscape level. The state natural resource agency could play a leading role by helping municipalities coordinate with one another, and by providing them with analysis and maps on critical areas for biodiversity conservation in the state, as in Massachusetts and underway in Delaware. Several other states, including Florida, New Jersey, and Oregon, have completed statewide biodiversity conservation mapping projects. In these states, Natural Heritage data and other sources of biodiversity information have been used to develop a statewide blueprint for conservation. These maps can help guide a variety of decisions to ensure that future land use activities minimize the loss of critical habitat and connect areas already under protection (see “Comprehensive Land Use Planning and Zoning” for more on Massachusetts BioMap and Delaware BioLegacy).

New Jersey’s new Freshwater Wetland Protection Act Rules may provide the most direct link of any state between the regulation of land use and endangered and threatened species habitat. The state’s rules regulate dredging, filling, and drainage of freshwater wetlands.¹⁵³ Under the program, individual and general permits may only be issued if the proposed activities will not “destroy, jeopardize, or adversely modify a present or documented habitat for threatened or endangered species; and shall not jeopardize the continued existence of any local population of a threatened or endangered species.”¹⁵⁴ In addition, wetlands classified as having “exceptional resource value” receive special protections.¹⁵⁵ These include wetlands that presently provide habitat for threatened or endangered species or that have “documented habitat for threatened or endangered species, and which remains suitable for breeding, resting, or feeding by these species during the normal period these species would use the habitat.”¹⁵⁶

In July 2002, the New Jersey Department of Environmental Protection (DEP) issued new rules governing the identification of present or documented habitat of threatened or endangered species for the purposes of defining freshwater wetlands of exceptional resource value. These rules state that these sites will be identified using data in the Landscape Project database, which is managed by DEP’s Endangered and Nongame Species Program, a part of the state fish and wildlife agency. The Landscape Project “focuses on habitat areas required to support local populations of threatened or endangered wildlife species.”¹⁵⁷

Prior to adoption of this new rule, threatened and endangered species habitat was determined by consulting the state’s Natural Heritage Program. Natural Heritage databases, however, only document discrete occurrences of species—for example, the nest where an endangered bird was spotted or the pond where an amphibian was identified. The Landscape Project, on the other hand, maps all significant wildlife habitat in each of the state’s landscape regions and seeks to identify not just specific sites where a threatened or endangered species have been identified, but the entire block of habitat upon which target species need to survive. For example, amphibians generally rely upon a diversity of habitats over their life cycles. They may need seasonal ponds for breeding, but spend the remainder of their lives in uplands. The earlier approach would only have protected the pond where the species was identified, and would have failed to protect the uplands where the species live for the majority of the year. The Landscape Project incorporates all of the endangered and threatened species location records from the state’s Natural Heritage Database, along with a variety of additional data from various sources.¹⁵⁸ This new approach to regulating activities in wetlands will help ensure that at-risk species habitat is thoroughly considered in the wetlands permitting process in New Jersey.

NON-LEGAL MECHANISMS— VOLUNTARY OUTREACH APPROACHES

Voluntary outreach programs that provide local governments, state agencies, and others with the technical information and expertise they need to incorporate biodiversity considerations into decision-making can be significant in promoting biodiversity conservation. These programs, although not required by law, can play an important role in ensuring that biodiversity considerations are factored into critical decisions about how land is used and managed, and therefore how it is or is not lost, fragmented, and degraded.

Of the 40 states that responded to the survey, almost 78 percent (31 states) indicated that Natural Heritage data are

¹⁵⁰ N.Y. Comp. Codes R. & Regs. tit. 6, § 617.14 (g)(1)(ii).

¹⁵¹ N.Y. Comp. Codes R. & Regs. tit. 6, § 617.14 (g)(1)(iv).

¹⁵² Telephone Interview with Nick Conrad, New York Department of Environmental Conservation, Division of Environmental Permits (Oct. 3, 2002).

¹⁵³ N.J. Admin. Code tit. 7, § 7A-2.2(a).

¹⁵⁴ N.J. Admin. Code tit. 7, § 7A-4.3(b)(3).

¹⁵⁵ A wetland’s classification is considered by DEP when making permitting decisions “in, among other things, evaluating alternatives to the proposed regulated activity, in determining the size of the transition area, and in determining the amount and/or type of mitigation required.” N.J. Admin. Code tit. 7, § 7A-2.4(a).

¹⁵⁶ N.J. Admin. Code tit. 7, § 7A-2.4(b).

¹⁵⁷ N.J. Admin. Code tit. 7, § 7A-2.4 (c).

¹⁵⁸ New Jersey Division of Fish and Wildlife, New Jersey’s Landscape Project for the Protection of Rare Species, at <http://www.state.nj.us/dep/fgw/ensp/pdf/landbro.pdf> (last visited Nov. 26, 2002).

being used voluntarily in innovative ways to guide local land use planning laws or policies (see “Survey Question 7” in Appendix B).¹⁵⁹ In these states it may be used as part of a statewide or regional biodiversity assessment or local land use planning outreach program. For example, the Connecticut Natural Diversity Data Base indicated that all 169 of the state’s towns are provided with maps of generalized locations of state listed species for use in municipal planning and permits. Although municipalities are not required to use this data, having it readily available can be enough encouragement for local governments to consider their potential impacts on biological resources.

Virginia’s Division of Natural Heritage, for example, has established a “Locality Liaison Program” to provide local governments in the state’s coastal zone with biodiversity information to aid in land use decisions that protect biodiversity and preserve open space. Staffed by a full-time employee funded through a National Oceanic and Atmospheric Administration Coastal Program Grant, the program develops and distributes maps depicting the location of Natural Heritage resources to each coastal resource management area in the state. The program also assists local governments with land use planning

and decision-making, the development of open space protection plans, and habitat restoration and protection initiatives.

Maine’s State Planning Office initiated a slightly different approach in 2000 with a program called “Beginning with Habitat.” A collaboration between the State Planning Office and the Maine Heritage Program, this program provides habitat maps, species descriptions, and guidance to local communities in southern Maine to help integrate biodiversity into local “smart growth” planning. This partnership acknowledges the planning office’s strength in working directly with communities and frees up the state Heritage Program to concentrate on inventory work.

With adequate funding and staff, Natural Heritage Programs and other state-based programs, which have access to information and have vital technical expertise on biodiversity, can help local governments and agency personnel to better incorporate biodiversity considerations into their day-to-day decision-making. Short of passing new laws or policies requiring the use of biodiversity information in land use decision-making, voluntary outreach programs sponsored by Natural Heritage Programs may offer the greatest opportunities for encouraging the use of biodiversity information in considerations of how land is used and managed.

¹⁵⁹ Alabama, Alaska, Arizona, California, Colorado, Connecticut, Florida, Georgia, Idaho, Illinois, Indiana, Kansas, Maryland, Michigan, Minnesota, Missouri, Nebraska, Nevada, New Jersey, New York, North Carolina, Oklahoma, Rhode Island, South Carolina, Tennessee, Utah, Vermont, Virginia, Washington, West Virginia, and Wisconsin.

RECOMMENDATIONS

There are many opportunities for state decision-makers to utilize biodiversity information when making land use decisions that can contribute to habitat loss, fragmentation, and degradation. As this report demonstrates, many states have been creative in taking advantage of some of the provisions they currently have on the books to encourage the use of heritage data in decision-making. However, ample opportunities exist in each state to establish a more direct link between land use impacts and biodiversity conservation. Below are a few recommendations on how to strengthen the land use planning-biodiversity connection:

- State agencies should seek out and take advantage of opportunities in existing laws and policies that can require an analysis of impacts to biological resources from proposed projects or activities. States should analyze the authorities they already have at their disposal in endangered species acts, wetlands laws or regulations, transportation planning laws or policies, environmental impact assessment laws, public land acquisition/open space programs, and land use planning and zoning laws. There may also be opportunities available in floodplain laws or regulations, coastal laws, forestry laws, critical area laws, fisheries laws, and historic preservation laws.
- The land use laws that do require, or could be interpreted to require, the use of Heritage data in decision-making at the state level should be viewed as essential conservation tools and integrated into a larger biodiversity conservation strategy.
- Impacts to biodiversity should be made in the context of a landscape or statewide analysis or biodiversity conservation plan. States can play a strong role in encouraging their agencies, local governments, and others to move beyond the site-based focus of analysis to the landscape scale. State agencies should sponsor the development of a spatially explicit, statewide biodiversity conservation strategy that can be used to help guide a variety of decisions to ensure that future land use activities seek to minimize the loss of critical habitat and connect areas already under protection.
- States should establish, fund, and staff local government technical support and outreach programs within their state's Natural Heritage program. Many local governments are supportive of using the land use tools at their disposal to encourage conservation. However, without adequate information and technical support, they have little ability and incentive to do so.
- An important next step in making existing biodiversity information useful to decision-makers will be the development of computerized decision support systems that integrate biodiversity information with other information commonly used in land use planning. Investments currently being made by NatureServe and other organizations hold the promise of revolutionizing the ease and speed with which decision-makers can access and understand the relative biodiversity impacts of various land use alternatives. States interested in advancing these tools can work with their Natural Heritage Programs and NatureServe to identify local resources and pilot projects where decision support systems can be tested and refined to meet local needs.

APPENDIX A

Linking Biodiversity Information and Land Use Decision-Making

A Survey of Natural Heritage Programs Conducted by the Environmental Law Institute in Partnership with the Association for Biodiversity Information

Project description: The Environmental Law Institute (ELI), in partnership with the Association for Biodiversity Information (ABI), is conducting a project to analyze existing state¹⁶⁰ and federal laws, regulations, and policies to determine whether they require — or could be interpreted to require—consultation with Natural Heritage programs. In some instances, the use of biological information (e.g., natural heritage data) is specifically required by state or local laws or policies. In other instances where state laws and policies could be interpreted to authorize the use of biological information, state agencies have not taken advantage of these possibilities. The answers you provide to this questionnaire will play a crucial role in helping us determine how natural heritage data are currently being used and to assess existing opportunities for expanding its use.

The final report will provide state heritage programs with information on how heritage data is used in other states, with the hope that more states can adopt policies that require the use of heritage information. It will also be designed to assist state agencies, local governments, and advocacy groups in their efforts to encourage the use of biological information in decisions that affect biodiversity. ABI hopes to use the information to provide heritage programs with the information they need to adopt new, or expand existing programs, that require the use of heritage information. Respondents will be added to a mailing list to receive the results of the study.

You may use the back of the form if you need additional space. If you would like a digital copy of this form, if you have any questions, or if you would like to discuss any of these issues more thoroughly, please contact Jessica Wilkinson at ELI at 609/818-0518 or eliwilkinson@home.com or Mary Klein at ABI at 703/908-1850 or mary_klein@abi.org.

Thank you in advance for taking the time to contribute to this study.

Name: _____ Title: _____
 Affiliation: _____
 Address: _____
 Telephone: _____ Fax: _____
 Email: _____

When answering the questions below, please answer to the best of your knowledge and as thoroughly as possible. If you know the names or citations for particular laws, regulations, or policies, please include them. If you do not have this information, please include whatever information you have, in whatever form it may be, as this will assist us in obtaining a complete picture of how natural heritage data is being used.

¹⁶⁰ For non-state NHPs, please interpret "state" to mean your territorial or tribal government.

1. What agencies and organizations most routinely request heritage data? Please specify the name of the agency or organization. If possible, indicate the number of requests you receive from each group annually. Alternatively, rank the frequency with which you receive requests from these entities by placing a number (i.e., 1, 2, 3...with 1 being the most frequent) in the space provided.

Check All
That Apply

Name of agency/number of requests per year
or ranked frequency

- State pollution control agency _____
- State natural resource agency _____
- State department of transportation _____
- State planning office _____
- Local government planning office _____
- State GAP Analysis program _____
- Research institution(s) _____
- Consultants _____
- Private sector, other _____
- Private landowner(s) _____
- Conservation organizations or land trusts _____

Federal agency(ies), i.e., U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, USDA Natural Resources Conservation Service, National Oceanic and Atmospheric Administration

Other: _____

2. Has your program experienced periods during which it received an unusually high volume of requests for a specific purpose, or periods during which the impact of the information requested was likely to be particularly significant? These periods may have resulted from a new law or judicial decision, from requests for GAP purposes, or for other reasons.

- Yes (see below)
- No

a. If yes, please describe the circumstances surrounding each period and indicate whether this information has already been accounted for in Question 1, above:

3. To the best of your knowledge, what laws and policies are driving the bulk of heritage data requests in your state? Please give citations, the popular name of the law or policy, and URLs to statutes or regulations where possible and indicate whether these are state or federal laws. Please rank the frequency with which a law or policy is driving heritage requests by placing a number (i.e., 1, 2, 3...with 1 being the most frequent) in the space provided.

Check All	Name of law/citation or link/ranked frequency
That Apply	

- Endangered species act _____
- Wetland law or regulation _____
- Environmental impact assessment law _____
- Floodplain law or regulation _____
- Critical areas law _____
- Historic preservation law _____
- Transportation planning _____
- Land use planning law _____
- Public land acquisition/open space program _____
- Fisheries law _____
- Coastal law _____
- Forestry law _____
- Other: _____

4. Are there laws or policies that could more effectively require the use of heritage data? For example, there may be a floodplain law that prohibits construction in floodplains if such projects will have “unreasonably detrimental effects upon the fish, wildlife, or botanical resources,” but that has not been interpreted to require consultation with heritage data.

- Yes (see below)
- No

a. If yes, please describe (and give citations where possible).

5. Does your state have a publicly funded open space acquisition program?

- Yes (see below)
- No

a. If so, is heritage information being systematically used to guide acquisition decision-making? Please describe how. For example, are the state or localities required to use heritage data to develop land acquisition priorities?

b. If heritage data is not used systematically in the open space acquisition program, is it used sporadically or on a case-by-case basis? If so, please describe.

- Yes (see below)
- No

c. If the acquisition program does not rely upon heritage data, how could heritage data be more effectively used to guide your state's publicly funded open space acquisition program(s)?

6. Does state law or policy require the use of heritage information in state or local land use planning?

- Yes (see below)
- No

a. If yes, please describe and cite to the extent possible the laws or authorities.

7. Is heritage information voluntarily being used in any innovative ways to help guide state or local land use planning laws or policies? For example, are local governments requesting data to help guide comprehensive plans or craft ordinances protecting environmentally sensitive lands?

- Yes (see below)
- No

a. If yes, please describe.

8. Is heritage information in your state being applied in innovative ways outside of a specific legal requirement? For example, is it being used as part of a statewide or regional biodiversity assessment or local land use planning outreach program?

- Yes (see below)
- No

a. If yes, please describe.

9. Are there other state or local laws or policies that require the consideration of impacts to non-threatened biotic elements or habitats (i.e., laws or policies that do not attempt to assess impacts to plants, animals or natural communities that are rare, at-risk, or of concern, and therefore, may not require consultation with Natural Heritage Programs, but rather another source of biodiversity information)? For example, a state law that requires local governments to include an evaluation of important game species in their comprehensive plans.

- Yes (see below)
- No

a. If yes, please describe. If possible, give citations, the popular name of the law or policy, or URLs to statutes or regulations.

10. Are there any laws or policies you would like to see in place that would encourage the use of biodiversity information in land use decision-making? Please include any additional information about how you think the use of biodiversity information could more effectively be integrated into land use decision-making.

Thank you for your assistance!

Please return by August 31, 2001 to Jessica B. Wilkinson, Environmental Law Institute, 420 Burd Street, Pennington, NJ 08534 or eliwilkinson@home.com. If you have any questions, please contact Jessica at 609/818-0518 or Mary at 703/908-1850.

The Environmental Law Institute is a not-for-profit organization based in Washington, DC. ELI's Research and Policy Division works with local and regional partners to strengthen environmental laws, to develop new theories and practical approaches to ensure their effectiveness, and to improve the capacity of citizens and governments to use the law to protect the environment. For more information on ELI, please visit <http://www.eli.org>.

The Association for Biodiversity Information works to develop, manage, and distribute authoritative information critical to the conservation of the world's biological diversity. For additional information on ABI, please visit <http://www.abi.org>.

APPENDIX B: SURVEY ANALYSIS

The survey provided in Appendix A was distributed to the Natural Heritage Programs in all 50 states, in addition to those in the District of Columbia, Great Smoky Mountains National Park, Navajo Natural Heritage Program, and Tennessee Valley Authority Regional Natural Heritage Program. Forty-three completed surveys were returned. Of these, 40 were included in the analysis provided in this report and in this appendix. Surveys from the District of Columbia and the Tennessee Valley Authority were not considered, as it was difficult to analyze results from these entities in comparison to states. In addition, the survey submitted by the Texas Conservation Data Center was incomplete.

This appendix is a summary of the responses provided by the 40 state Heritage Programs analyzed in this study.

Survey Question 1: What agencies and organizations most routinely request Heritage data?

Response:

All 40 of the responding states (100 percent) indicated that consultants routinely request Natural Heritage data; 97.5 percent (39 states) indicated federal agencies, like U.S. Fish and Wildlife Service, USDA Forest Service, Bureau of Land Management, U.S. Environmental Protection Agency, the

U.S. Army Corps of Engineers, USDA Natural Resources Conservation Service, National Oceanic and Atmospheric Administration, and the Department of Defense; 95 percent (38 states) indicated conservation organizations/land trusts and state departments of transportation; 90 percent (36 states) indicated state natural resource agencies; 87.5 percent (35 states) indicated local government planning offices; 80 percent (32 states) indicated research institutions, particularly universities; 67.5 percent (27 states) indicated private landowners; 60 percent (24 states) indicated state pollution control agencies; 55 percent (22 states) indicated private sector representatives such as paper and timber companies, utility companies, corporations, and media; 45 percent (18 states) indicated state Gap Analysis Programs; 40 percent (16 states) indicated “others,” including state departments of agriculture, state departments of administration, state departments of commerce and community affairs, state offices of economic development or public trust lands, regional planning commissions, and tribal governments; and 30 percent (12 states) indicated state planning offices. The above percentages do not total 100 percent because states often indicated that more than one agencies/organizations requests Heritage data.

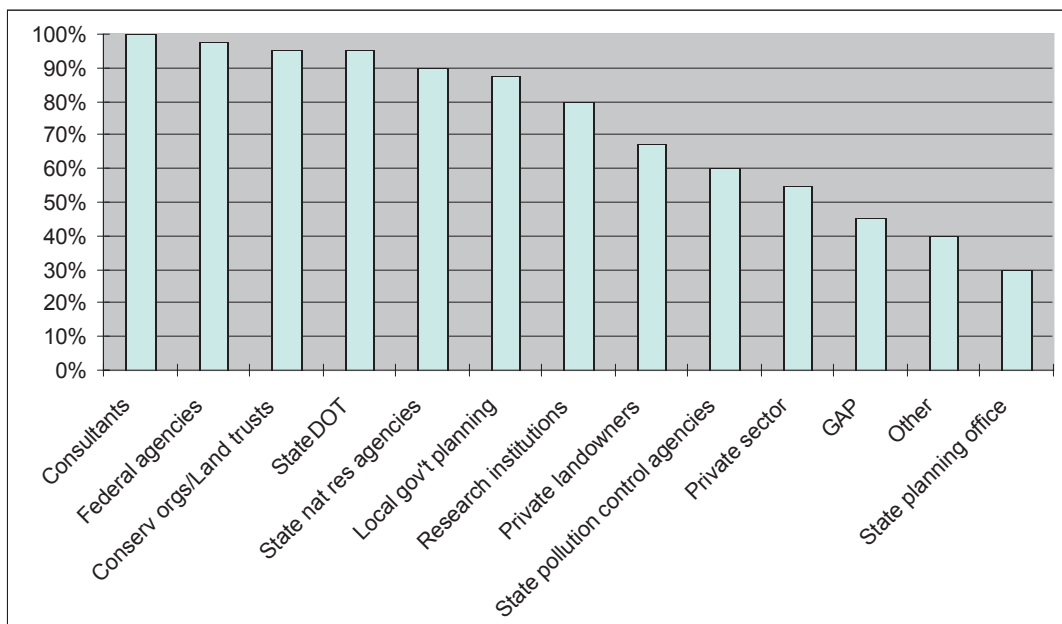


Table 2. Proportion of the 40 responding states that indicated the types of agencies/organizations that most routinely request Natural Heritage data. The groups considered are: consultants; federal agencies; conservation organizations or land trusts; state departments of transportation; state natural resource agencies; local government planning offices; research institutions; private landowners; state pollution control agencies; private sector; state GAP Analysis Programs; state planning offices; or other.

Survey Question 2: Has your program experienced periods during which it received an unusually high volume of requests for a specific purpose, or periods during which the impact of the information requested was likely to be particularly significant?

Response:

Thirty states (75 percent) indicated that their programs have received a high volume of requests for data for a specific purpose or periods during which the impact of the information requested was likely to be particularly significant. Of these 30 states, 24 provided more explicit information on what was driving these requests and how the requested data were to be used.

Not surprising, the most common response—about 67 percent—was that the data were being used during an environmental review process (e.g., to develop an environmental impact statement) in relation to development projects potentially impacting threatened and endangered species, wetlands, and other natural resources. Eight states indicated that the siting of cell/communication towers has driven frequent data requests, due to Federal Communications Commission rules requiring that cell tower permits undergo National Environmental Policy Act review. Four states indicated that state transportation actions drove requests, and to a lesser extent gas and mining permits. Other federal projects, such as those to control invasive or weed species (e.g., grasshoppers) or to develop trails, which would require sensitive species clearances, also prompt Heritage data requests.

In addition to environmental impact assessment laws, Heritage Programs indicated that endangered species laws, critical areas laws, wetland laws, smart growth/land use laws, and open space/land acquisition laws were the source a high volume of requests for a specific purpose. Seven states indicated that endangered species laws (federal and state) were driving requests. Also driven by endangered species laws, two states indicated that Natural Heritage information was used by agencies such as Federal Emergency Management Agency and Natural Resources Conservation Service to evaluate the extent of damage after natural disasters, such as floods and hurricanes. The other provisions cited (i.e., critical areas laws, smart growth laws) were only mentioned once by the responding states.

In addition to legal requirements, Heritage Programs indicated voluntary programs or initiatives were driving data requests. Six states indicated that state or local plans prompt requests, including the development of comprehensive plans by municipalities, forest management plans by public agencies, habitat conservation plans by counties, and ecoregional plans by The Nature Conservancy. Gap Analysis Programs have driven frequent requests in three states. Three additional states indicated that land acquisition programs/actions drive requests; for example, Montana indicated that the annu-

al review by public agencies of public land trades and releases cause an influx of Natural Heritage data requests. One state indicated that a cooperative resource management initiative, which assists landowners with private land management, also prompted a high volume of data requests.

Survey Question 3a: To the best of your knowledge, what laws and policies are driving the bulk of Heritage data requests in your state?

Response:

Thirty-seven of the 40 responding Natural Heritage Programs (92.5 percent) reported that the endangered species laws drive the bulk of Heritage data requests in their state; 80 percent (32 states) indicated wetland laws/regulations; 70 percent (28 states) indicated transportation planning laws/policies; 62.5 percent (25 states) indicated environmental impact assessment laws; 50 percent (20 states) indicated public open space or land acquisition laws/programs; 32.5 percent (13 states each) indicated land use planning laws/programs; 22.5 percent (nine states) indicated coastal area, forestry, and floodplain laws; 17.5 percent (seven states) and critical areas laws; 7.5 percent (three states) indicated fisheries laws; and 5 percent (two states) indicated historic preservation laws. In addition, 25 percent (10 states) indicated that other laws drive requests, including surface mining statutes, solid waste landfill requirements, USDA Forest Service sensitive species regulations, National Pollutant Discharge Elimination System (NPDES) requirements, public land management regulations/policies on timber, mineral, or grazing extraction/management, Illinois' Natural Areas Preservation Act, Wisconsin's Natural Heritage Inventory Statute, or New Jersey's Pineland Protection Act. The above percentages do not total 100 percent because states often indicated several agencies/organizations that request Heritage data throughout the year.

Survey Question 3b: Please rank the frequency with which a law or policy is driving Heritage requests by placing a number (i.e., 1, 2, 3...with 1 being the most frequent) in the space provided.

Response:

In 3a, Natural Heritage Programs were asked to indicate which state and federal laws and policies were driving data requests. The following laws were cited in order of the number of states responding affirmatively: endangered species laws; wetland laws/regulations; transportation planning laws/policies; environmental impact assessment laws; open space/land acquisition laws/programs; and land use planning laws/programs.

For each of these laws, the Heritage Programs were asked to rank the frequency with which the law or policy was driv-

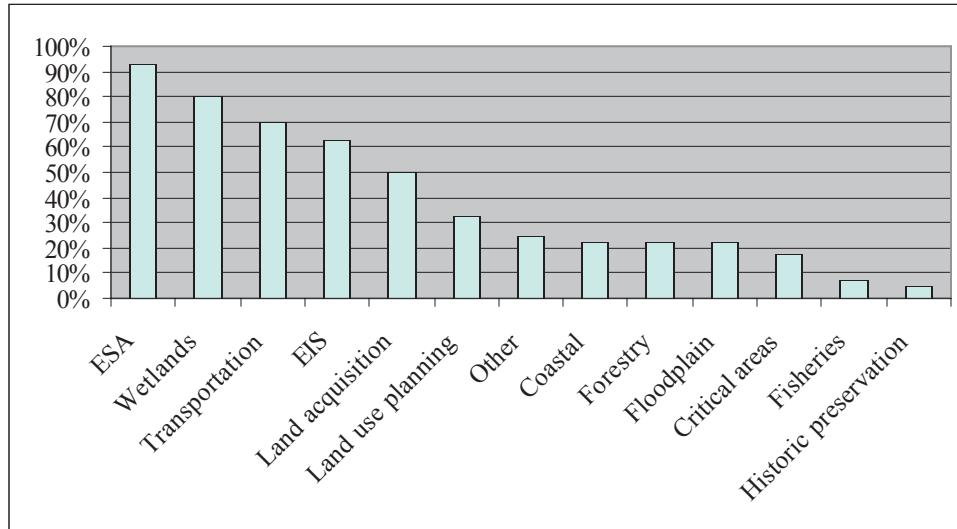


Table 3. Proportion of the 40 responding states that indicate the types of laws and policies driving the bulk of Heritage data requests. The laws considered are: endangered species laws (ESA); wetland laws/regulations (Wetlands); transportation planning laws/policies (Transport); environmental impact assessment laws (EIS); open space/land acquisition laws/programs (Land acquisition); land use planning laws/programs (Land use planning); coastal laws (Coastal); forestry laws (Forestry); floodplain laws/regulations (Floodplain); critical areas laws (Critical areas); fisheries laws (Fisheries); historic preservation laws (Historic preservation); and other.

ing data requests. Of the six top ranked authorities, endangered species laws were ranked by 55 percent of the states that responded as the leading driver of Natural Heritage requests.¹⁶¹ Seven percent of state programs ranked these laws as the third driver, 15 percent as the fourth driver, 11 percent as the fifth driver, and 20 percent as the sixth driver. In other words, endangered species laws drive Heritage requests in the greatest number of states and in those states where they drive requests, are responsible for the greatest number of requests.

Forty-two percent of the responding programs indicated that wetlands laws/regulations were the second leading driver of data requests. Almost 30 percent of respondents ranked transportation planning laws/policies as the second leading driver, and 25 percent of responding programs indicated that environmental impact assessment laws were the second leading driver. Seventeen percent of states placed wetland laws as the third driver of data requests, 15 percent as the fourth driver, and 22 percent as the fifth driver.

Transportation planning laws/programs were ranked as the third driver of Heritage requests by 33 percent of respondents and as the secondary driver by 29 percent of respon-

dents (as mentioned above). Both transportation laws/policies and land use planning laws/programs were most frequently ranked as the fourth driver among respondents (23 percent).

Three laws were ranked evenly by states as the fifth driver: wetlands, transportation, and land acquisition (22 percent of respondents). However, none of these laws were ranked as a primary or secondary driver of Heritage data. In contrast, 40 percent of all state programs ranked land acquisition laws/policies as the sixth driver.

Survey question 4: Are there laws or policies that could more effectively require the use of Heritage data? If yes, please describe.

Response:

Half of the 40 responding states (20 states) indicated that certain laws or policies could more effectively require the use of Natural Heritage data. Sixteen of the states provided additional insight into which particular laws or policies could better require the use of Heritage data. Several states indicated that environmental impact assessment laws (both federal and state NEPAs) could better require consultation with Heritage database as part of the review process. Impact assessments of oil and gas, surface mining, and timber extraction/development, particularly on federal lands, were mentioned by several respondents as areas that would benefit from Heritage consul-

¹⁶¹ Percentages were determined by dividing the number of states that ranked a particular law/policy at a certain level by the total number of states that provided ranking information for the same level. For example, 55 percent of states that rated endangered species laws as the leading heritage driver (labeled rank one) was determined by dividing the number of states that ranked ESA as number one (17 states) divided by the total number of states that provided number one rankings (31 states). This method was used to account for the varying proportions of states that provided rankings at the different levels (rank one, rank two, rank three, etc.) Rankings were not determined beyond the sixth level since a small proportion of states provided ranking information for the lower rankings.

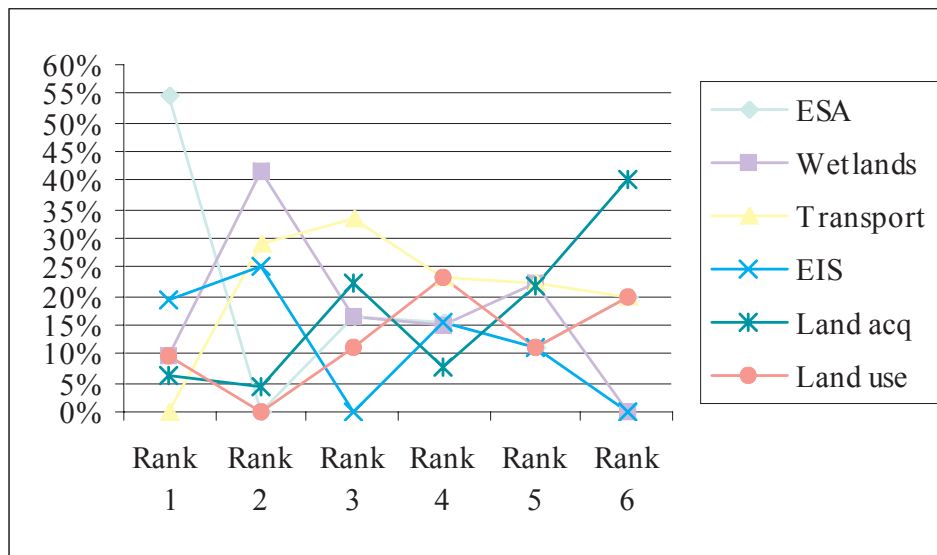


Table 4. Proportion of responses by Natural Heritage Programs that indicate how six primary laws rank in the frequency they drive data requests in the state. Laws ranked as number one, indicate that this law is the greatest source of Heritage data requests. The laws considered are: endangered species laws (ESA); wetland laws/regulations (Wetlands); transportation planning laws/policies (Transport); environmental impact assessment laws (EIS); open space/land acquisition laws/programs (Land acq) and land use planning laws/programs (Land use).

tation. Three states indicated that state natural resource laws (i.e., wetland laws, coastal development laws) should better incorporate data review, particularly for state water resources like rivers, lakes, and streams. Colorado suggested that all projects involving state funding (e.g., land acquisition, conservation easements, steward trust) be subject to Heritage consultation.

According to three states, state planning or smart growth acts should require Heritage consultation, while one state recommended that consultation be required under a private sewage disposal licensing act. In Kansas, existing authorities were perceived as too weak to provide for conservation of biodiversity on private lands, where most of the state’s natural resources reside. Additionally, development of upland sites was suggested as being under-regulated as compared to resources like wetlands.

One common overarching issue expressed by respondents was that even if there are requirements that impacts to listed threatened and endangered species be evaluated, non-listed species—such as rare, declining, or unique species—are not factored into reviews. Heritage Programs often provide data on at-risk species when they receive requests for information on threatened or endangered species, as Heritage databases contain a wealth of information on such species. However, it is unclear whether this supplementary data are considered when provided. In addition, even if laws/regulations require that impacts to rare or endangered species or significant ecological resources be assessed, they often do not specify the

types of data that must be consulted; thus, there is no real assurance that Natural Heritage data will be used if provided.

Survey Question 5a: Does your state have a publicly funded open space acquisition program? If so, is Heritage information being systematically used to guide acquisition decision-making?

Response:

Twenty-nine states (72.5 percent) indicated that their state has a publicly funded open space acquisition program.¹⁶² Of these states, 45 percent (13 states) indicated that state open space acquisition programs systematically use Natural Heritage data to prioritize and/or select sites.

Forty-eight percent (14 states) indicated that Heritage data were sporadically used. In these states, Natural Heritage data were consulted but not systematically used to prioritize sites in four states; use of data was not required but recommended in three states; data were used by some, but not all acquisition programs in five states; and data were used for only certain aspects of the program (e.g., to determine conservation easements but not land acquisition, or used to prioritize wildlife habitat and not urban parks) in two states. Seven percent (two states) with open space land acquisition program did not use Natural Heritage data.

¹⁶²The following states indicated that they have a publicly funded open space acquisition programs: AL, AR, AZ, CA, CO, CT, DE, FL, GA, IA, IL, IN, KS, MD, MI, MN, MT, NC, NJ, NY, OR, PA, RI, SC, UT, VA, VT, WA, and WI.

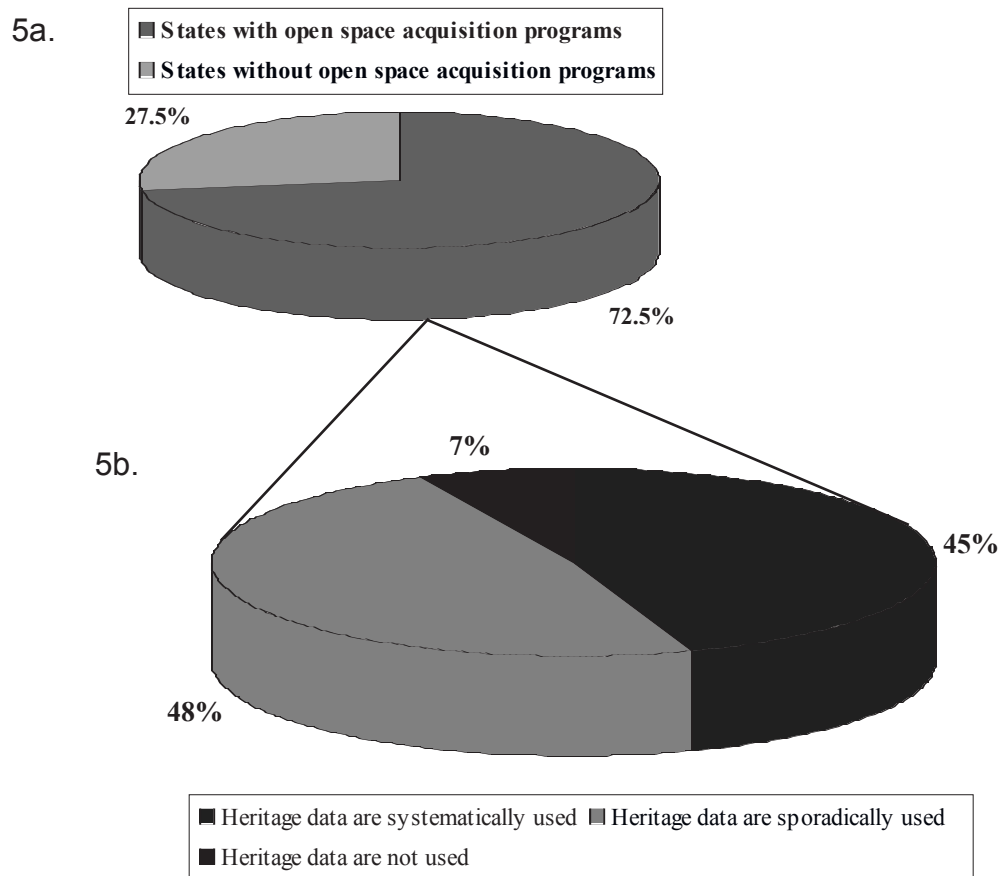


Table 5a. Proportion of responding states that have and do not have publicly funded open space land acquisition programs in their states.

Table 5b. Proportion of states with publicly funded open space programs that 1) use Natural Heritage data systematically; 2) use Heritage data sporadically; and 3) do not use Heritage data.

Survey Question 6: Does state law or policy require the use of Heritage information in state or local land use planning? If yes, please describe and cite to the extent possible the laws or authorities.

Response:

Ten states responded that state law/policy does require the use of biodiversity information in state or local land use planning. Upon further examination, only four of these states—Oregon, Rhode Island, Vermont, and Wisconsin—provided adequate information to support that a certain state land use law/policy requires some analysis of the impacts of land use decisions on areas of significant ecological value. However, only Rhode Island indicated that this analysis explicitly requires the use of Heritage data.

In Oregon, a state planning law requires counties to protect areas with “significant ecological or biological values.” Each municipality in Rhode Island is required to complete a “Comprehensive Community Plan” that includes a natural

resource element incorporating Natural Heritage data. Act 250, chapter 151, in Vermont requires that projects meet certain thresholds based on 10 criteria. Municipal and Regional Planning Development Act T.24, chapter 117 (Act 2000) encourages local governments to plan for local development in accordance with regional plans and statewide guidance. Wisconsin Smart Growth legislation requires the development of comprehensive plans that considers twelve items, including categories of natural resources.

Survey Question 7: Is Heritage information voluntarily being used in any innovative ways to help guide state or local land use planning laws or policies?

Response:

Thirty-one of the forty responding states (77.5 percent) reported that Natural Heritage information is voluntarily being used in innovative ways to help guide state or local land use planning laws or policies. Respondents overwhelming

indicated that Heritage data are being used to identify sensitive areas within state/local comprehensive plans or town plans, as well as when developing habitat conservation plans. Heritage information is being used to guide open space planning, watershed management, zoning, or natural resource inventories in many states. Indiana reported that Heritage data are being used to score farm incentive programs and outdoor recreation grants in the state. Two states—Washington and New York—indicated that county wetland ordinances authorize increased protection, through set back or buffer requirements, for wetland and/or riparian areas with known Natural Heritage occurrences. In Tennessee, rapidly growing counties have incorporated Natural Heritage data in Geographic Information System models that examines various scenarios for growth. Similarly, a county department of transportation in Arizona is using Heritage data in transportation suitability models.

Survey Question 8: Is Heritage information in your state being applied in innovative ways outside of a specific legal requirement?

Response:

Twenty-nine of the 40 responding states (72.5 percent) indicated that Natural Heritage information is being applied in innovative ways outside of a specific legal requirement. The most frequent response (13 states) was that Heritage data are being used to help guide comprehensive state biodiversity strategies, biodiversity identification and mapping projects, and acquisition programs. For example, Heritage data are being used to identify biodiversity resource areas as part of the Vermont Biodiversity Project and in Florida to identify statewide conservation needs in order to prioritize lands for acquisition under the Florida Forever program. In addition, 11 states indicated that Natural Heritage data are being used to guide ecoregional planning conducted by The Nature Conservancy, a national conservation organization.

Survey Question 9: Are there other state or local laws or policies that require the consideration of impacts to non-threatened biotic elements or habitats (i.e., laws or policies that do not attempt to assess impacts to plants, animals or natural communities that are rare, at-risk, or of concern, and therefore, may not require consultation with Natural Heritage Programs, but rather another source of biodiversity information)?

Response:

Fourteen states indicated that their state has state or local laws or policies that require the consideration of impacts to non-threatened biotic elements or habitats.¹⁶³ The most common response (cited by five states) was that wildlife laws or policies may be used to consider impacts on more common species or habitats. Three states—Connecticut, Montana, and New York—indicated that state environmental impact assessment laws may provide this authority. The remainder of the Heritage Programs indicated that river and riparian resources, pollution control, storm water discharge, mining, and forestry provisions may require consultation. In Colorado, cooperative efforts like the Natural Areas Partnerships Initiative (developing a statewide strategy to protect natural areas) and the System for Conservation Planning (a project of the Division of Wildlife to set priorities for habitat protection) may be other sources for biodiversity information. In addition, the state has some scattered impact assessment requirements; for example, by statute the Division of Wildlife requires applicants proposing to construct a water project to prepare a mitigation plan.¹⁶⁴

Survey Question 10: Are there any laws or policies you would like to see in place that would encourage the use of biodiversity information in land use decision-making? Please include any additional information about how you think the use of biodiversity information could more effectively be integrated into land use decision-making.

Response:

Several Heritage Programs provided novel responses related to the need in states to have stronger authorities in place to protect plant communities and also significant or declining habitats that were not covered under other questions. Two states suggested that natural areas legislation should be passed and funded to improve the role of the state parks/preserves system. To improve Natural Heritage data accessibility to decision-makers, several states indicated the need to provide Natural Heritage information over the Internet. Developing the capacity to submit updated information for Heritage databases electronically was cited to likely improve efficiency. In addition, states recommended that local governments be provided with integrated decision support systems that employ readily accessible Geographic Information Systems data, including Heritage information, which would inform land use planning locally.

¹⁶³ AK, AZ, CO, CT, GA, MN, MT, NC, NV, NY, TN, VT, WI, and WV.

¹⁶⁴ Colo. Rev. Stat. Ann. §37-60-122.2; 2 Colo. Code Regs. §§1660 et seq. (see <http://ipl.unm.edu/cwl/statbio/colorado.html>)

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