

# Vermont's Wildlife Action Plan

November 22, 2005

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*\*formally the Comprehensive Wildlife Conservation Strategy (CWCS)*



# Monitoring & Adaptive Management

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This section of the Action Plan outlines plans to track the status of Species of Greatest Conservation Need (SGCN), evaluate and improve the effectiveness of conservation strategies and provide data to keep the Action Plan report up-to-date.

## Adaptive Management

Elements five and six of the Eight Required Elements of a Action Plan outline Congressional expectations for monitoring and plan review in the Action Plan report. Specifically element five requires that states provide:

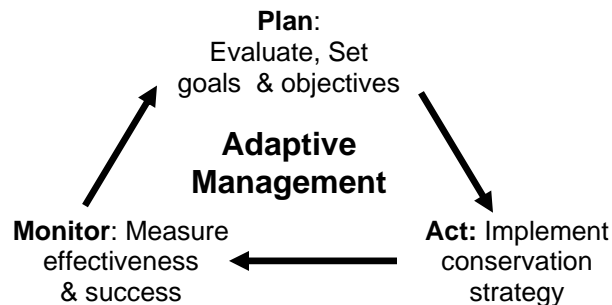
Proposed plans for monitoring species [of Greatest Conservation Need] and their habitats, for monitoring the effectiveness of the conservation actions proposed in the 4th element [strategies], and for adapting these conservation actions to respond appropriately to new information or changing conditions.

Element six requires that states provide:

Descriptions of procedures to review the strategy at intervals not to exceed ten years.

Just as a doctor checks a patient's blood pressure at every visit, wildlife monitoring allows biologists to identify changes in the health of wildlife (e.g., population changes, the spread of disease, changes to the landscape). Wildlife biologists can also monitor the impact of strategies to determine effectiveness just as doctors assess the efficacy of treatments and compare competing medical practices. The goal is not simply to cure one patient but improve the understanding and standard of care for all patients.

Taken together elements five and six speak to the need for an adaptive management program to track changes in wildlife populations and hone the effectiveness of conservation strategies. Adaptive management is a formalized method for learning from experience (Fig 1) where design, management, and monitoring are integrated to test assumptions in order to adapt, learn and improve (Salafsky et. al. 2001). Instead of relying on a fixed conservation goal and an inflexible plan for achieving the goal, adaptive management allows for midcourse corrections.



**Fig 5-1 Basic steps in an adaptive management process (adapted from Noss & Cooperider 1994)**

In the initial **planning** phase our Action Plan Species Teams and the Integration Team spent many hours evaluating data, identifying problems limiting SGCN and habitats. They

then developed hundreds of conservation strategies and research recommendations that the Vermont Fish & Wildlife Department (VFWD), Conservation Partners and others could begin to implement during an **action** phase. Measuring the effectiveness and success of the plans and actions occurs in the **monitoring** phase. The cycle begins anew with the fine-tuning of goals and objectives before action is renewed.

Monitoring is a linchpin in the adaptive management process. Monitoring is also a complex, demanding and never-ending task. With VFWD, sister departments at the Agency of Natural Resources, conservation partners, other local and federal agencies, academic institutions, non-governmental organizations and even individuals engaged in a broad range of wildlife and habitat monitoring projects, before any new monitoring programs are initiated a review of existing efforts and careful planning are required.

### **Current Survey and Monitoring of Vermont Wildlife**

A list of current survey and monitoring projects that may provide relevant data for the conservation and management of SGCN is remarkably long. The Fish & Wildlife Department along with the Department of Environmental Conservation (DEC) and other conservation partners monitor state and federally designated threatened and endangered species, and some rare species and uncommon natural communities. VTTrans in coordination with VFWD is recording road mortality data on the state highway system. Additionally data from wildlife surveys are regularly collected by VFWD's Nongame & Natural Heritage Program (NNHP). Many of these surveys, however, are not repeated enough to provide population trends, nor are they sufficient in extent to provide statewide estimates. In general baseline distribution and abundance estimates for SGCN has never been determined. Population trends, habitat availability or impacts of threats are similarly unknown. Nonetheless, any new monitoring efforts should build on these and other existing monitoring programs, as well as the expertise of the VFWD, conservation partners and others within Vermont, regionally and nationally.

The following is a cursory review of survey and monitoring efforts in Vermont that may benefit SGCN conservation and management. It is not meant to be comprehensive.

**Birds:** Birds are the most studied and best monitored group of wildlife in Vermont—and nationally. Key Vermont monitoring efforts include the Breeding Bird Atlas (Vermont Institute of Natural Science (VINS) & VFWD—sponsored by the State Wildlife Grants program (SWG)), the annual Breeding Bird Surveys (NABCI), and the Common Tern, the Important Bird Area and the Marshbird Monitoring programs (Audubon). The Vermont Institute of Natural Science has maintained bird data since 1974 with the eBird Online database. VINS also manages the Mountain Birdwatch, Forest Bird Monitoring Project, Loon Recovery Project, the Peregrine Falcon recovery program (with VFWD) and monitors of Bicknell's thrush on Hispaniola and of bobolink in Paraguay and Bolivia. A multi-party effort is underway to restore and monitor bald eagles in state. Other species-specific and guild-specific monitoring occurs for, osprey, American woodcock, turkey, waterfowl, and double crested cormorants. Regional and national monitoring efforts include the Breeding Bird Survey and Atlantic Coast Joint Venture.

**Fish:** Historically referred to as "vermin fishes" (Greeley 1930) and "trash fish," the species not prized by anglers have not been the focus of fisheries biologists either. More recently a variety of entities have been conducting surveys on a broader range of fish including some SGCN. *Fishes of Vermont* (Langdon et. al. in prep) is supported by DEC's 9,000 record fish distribution database. Non-native invasive species, such as alewife and zebra mussel, are also the subject regular surveys.

**Invertebrates:** Mussels may be best monitored of all Vermont invertebrates with semi-permanent survey stations in place. The SWG sponsored Vermont Butterfly Survey; a citizen science-based monitoring program coordinated by VINS is Vermont's first state-wide systematic inventory of invertebrate species. Some invertebrate monitoring occurs for pest species (FPR and Agency of Agriculture), as indicators of water quality (DEC) for several threatened and endangered invertebrates such as tiger beetles (3 species) and mollusks (10 species). DEC's water quality monitoring employs an index of integrity based on the composition of invertebrates in water bodies. Some taxa-wide surveys include moth surveys at Ethan Allen Firing Range (Griggs and Grehan 2000) and Mount Mansfield (Griggs and Grehan 2001). Nevertheless, most invertebrate taxa remain largely uninvestigated and unknown in Vermont. There remains a serious need for basic background survey work to document the presence and distribution of major orders of insects in Vermont, notably Odonata (dragonflies and damselflies).

**Mammals:** Deer, moose, black bear and furbearing species are closely monitored by VFWD. Keeping Track, Inc. has citizen monitoring teams in many sections of the state and region collecting long-term data on black bear, bobcat, moose, fisher, river otter, and mink. Threatened and Endangered species include American marten, and Canada lynx. Monitoring of several bats species in certain regions of the state has begun in the past three years funded by SWG. Most other mammals, particularly small mammals, have not been monitored historically and no baseline data is available. Numerous individual localized surveys have occurred in the past but on ongoing, repeatable monitoring have not taken place.

**Reptiles & Amphibians:** The Vermont Reptile and Amphibian Atlas (Middlebury College) is an ongoing citizen science research and monitoring project begun in 1995 to determine the distribution of reptiles and amphibians in Vermont. Additionally monitoring for some threatened and endangered reptiles and amphibians is conducted by VFWD, and DEC initiated Northern Leopard Frog surveys in 1996 in response to reports of malformed frogs in the Lake Champlain Basin.

## **Current Habitat and Vegetation Monitoring in Vermont**

- Coordinated wildlife surveys (songbirds, reptiles, amphibians, and selected mammals—black bear, fisher, and bobcat) were conducted statewide in 2003-2004 by the Vermont Cooperative Fish and Wildlife Research Unit (VT Coop). These surveys provide a consistent statewide, on-the-ground baseline data for monitoring and results will inform predictive occurrence models for multiple taxa (T. Donovan, VT Coop), personal communication).

- The Ambient Biomonitoring Network program was established by DEC's Water Quality Division 1985 to: monitor long-term trends in water quality as revealed in changes over time to ambient fish and aquatic macroinvertebrate communities; to evaluate site-specific impacts of point and non-point discharges to aquatic biological communities, and to establish baseline data to assist in establishing Vermont-specific biological criteria for water quality classification attainment determinations in lakes, wetlands, rivers, and streams (DEC 2004b)
- The Long-Term Water Quality and Biological Monitoring Project for Lake Champlain began in 1992. A joint effort shared by DEC and the New York State Department of Environmental Conservation the n 1995, the primary purpose of the project is to detect long-term environmental change in the lake.
- The Vermont Wetlands Bioassessment Project is a coordinated effort between DEC and NNHP to document and understand biological and physical characteristics associated with vernal (seasonal) pools and northern white cedar swamps in the state (DEC 2004b).
- A joint Agency of Transportation-VFWD wildlife road crossing project is identifying significant wildlife travel corridors and road crossings to help reduce roadkill and improve future road design and placement.
- The Forest Inventory and Analysis (FIA) is a recurring inventory conducted by the US Forest Service's FIA Unit of the Northeastern Research Station in conjunction with the Vermont Department of Forests, Parks & Recreation. The inventory provides data for measuring changes and trends in the extent and condition of forest land, associated timber volumes, and rates of timber growth, mortality, and removal (Wharton et. al 2003). Though this information is developed primarily for timber management and does not track old-growth forests it does provide important information to wildlife managers.
- The National Resources Inventory program of the National Resource Conservation Service (NRCS) collects and distributes data on a state, regional and national level about the status, condition, and trends of soil, water, and related resources. The focus is primarily on agricultural lands with data includes available land-use types and land-use changes, erosion, and wetlands.
- The Gap Analysis Project (GAP) sponsored by the US Geological Survey (USGS) provides nationwide land cover data that can be used to identify lands important to wildlife and the extent to which habitat for native animal and plant species are being protected. A revised Vermont/New Hampshire GAP report is expected in 2007 (USGS 2005).
- The Vermont Monitoring Cooperative (VMC) coordinates numerous monitoring and survey operations in Vermont focusing primarily on forest health issues.
- The Nongame and Natural Heritage Program conducts ongoing natural community inventory identifies and maps natural community types statewide. A survey and

report on the distribution, ecology, classification of hardwood swamps was completed in 2004. NNHP also updates and maintains data on known and mapped significant natural communities, maps natural communities on state land and works with non-governmental organization partners to map or identify significant natural communities on NGO lands.

- **Habitat Loss and fragmentation:** the Vermont Forum on Sprawl can provide research, tools and training to track changes to habitat due to development. Also the NRCS State Office is creating a GIS layer urban and built-up lands by County. This GIS-based data may be helpful in efforts to assess habitat fragmentation

### **What Kind of Monitoring Is Needed to Successfully Implement the Wildlife Action Plan and Conserve SGCN?**

In addition to monitoring the status, trends and problems impacting SGCN populations, an adaptive management program requires implementation, effectiveness and validation monitoring (Derr et. al 2005) to ensure that goals and objectives are achieved and SWG funds are spent wisely:

- **Implementation Monitoring:** Assessing the degree to which a conservation strategy was implemented (e.g., were trees planted in a riparian area?).
- **Effectiveness Monitoring:** Measuring the impact or effect of a conservation strategy (e.g., did planting trees in the riparian area stabilize the streambank?—the strategy’s objective).
- **Validation Monitoring:** Checking the assumptions upon which the conservation strategy was based (e.g., did stabilizing the streambank actually reduce sedimentation of spawning beds downstream, producing more salmon fry? —the strategy’s objective). Validation monitoring can help answer questions such as: Is the conservation strategy worth repeating or might another strategy produce results faster, more economically, or meet with better social acceptance?

The Fish & Wildlife Department already has implementation and financial monitoring protocols operating for State Wildlife Grants-funded projects. SWG project managers have 90 days from completion of a project to submit a draft report to the VFWD Division Director associated with each project. Division Directors review and edit the report and are responsible for final approval of all reports. Upon final approval reports are submitted to the US Fish & Wildlife Service Division of Federal Assistance for review.

SWG project managers review expenditure tracking reports report according to a regular schedule each year. Financial reporting of all in-kind match is required annually. Project managers are responsible for securing this information from third-parties organizations and contractors. The VFWD business office also tracks and documents third party match.

Though critically important, effectiveness and validation monitoring may not be practical or possible for each SWG funded conservation project (e.g., small scale, dispersed, technical support). Effectiveness may take years to determine (e.g., waiting for trees to grow to

sufficient height to shade a stream) and validation of a strategy's success may be difficult to tease out from other problems impacting a species or a site (e.g., the strategy did produce more salmon fry but the results were masked two unseasonably hot summers and an accidental chemical spill). SWG administrators and planners may want to focus conservation efforts on specific species and/or regions of the state (e.g., selected watersheds) for periods of time sufficient to ensure that the cumulative conservation efforts can be measured effectively. The demonstration projects can be rolled out to the elsewhere in the state after evaluation proves their utility.

## **Primary Challenges to the Implementation of a SGCN Monitoring Program**

Pursuant to Congressional requirements Action Plan technical teams identified priority monitoring needs for every SGCN. Performance measures were also developed aid in implementation and effectiveness monitoring of Action Plan conservation strategies. However plans to implement a comprehensive monitoring program will first have to address four overarching issues:

1. Financial and staffing resources are insufficient to manage the current volume of wildlife survey and monitoring data developed by resource professionals.
2. Little data exists for most SGCN (lack of data was one criterion for selection as a Species of Greatest Conservation Need). Developing baseline distribution and abundance estimates is the first step in monitoring populations.
3. Despite SWG funds, financial resources are insufficient to support individual monitoring programs for 143 vertebrate and 188 invertebrate Species of Greatest Conservation Need.
4. Consistent protocols and systems for data collection and data sharing do not exist. Without the ability to collect and share data opportunities are lost and efforts can be duplicated.

To be successful, any Action Plan monitoring program will need to address these four challenges. It is hoped that the Action Plan and SWG funds will help direct future research and development efforts, facilitate the integration of existing monitoring projects across organizations and improve collaboration.

## **Adapting Conservation Actions in Response to New Information or Changing Conditions**

White-tailed deer, the most closely watched animal in the state, underscores the need to adapt management to changing conditions and information. Vermont's deer management plan was crafted by many experts with seemingly limitless oversight and review. The recent finding of chronic wasting disease in the New York deer population, however, significantly changed the landscape for deer management in the region. New legislation, rules and procedures to protect the herd and the public were designed and implemented within weeks of confirmation of the initial findings. Action Plan monitoring and review procedures will be the primary tool to identify new information, changing conditions and the need for

adaptation. It will act at three scales—individual conservation projects, ongoing plan-wide adaptations (year-to-year), and 10-year plan review.

The iterative nature of adaptive management (plan→ implement→ monitor→ evaluate→ plan→...) builds opportunities to adapt directly into Action Plan project management activities. Project reporting, monitoring and the increased communication and coordination among conservation partners fostered by Action Plan implementation will feed into overall Action Plan management from year-to-year. All this information will be used to formally review and revise the Action Plan on a 10-year cycle (see also Action Plan Review later in this chapter).

### **Plans for Monitoring SGCN, Habitats and Conservation Actions**

A statewide wildlife monitoring and adaptive management program is needed to measure progress toward desired outcomes for SGCN, their habitats, to evaluate and improve the effectiveness of conservation strategies, to adapt conservation actions to new information or changing conditions and to sustain the effectiveness of strategies in attaining desired outcomes. There was insufficient time to develop such a complex and important program prior to the October 1, 2005 deadline for Action Plan completion. In the coming months the Vermont Fish & Wildlife Department will initiate a collaborative process to develop and implement a statewide wildlife monitoring and adaptive management program to answer the following questions (adapted from USFS 2004, Schoonmaker and Luscombe 2005):

- What are the status and trends of SGCN, their habitats, and other important communities for which there are not specific anticipated outcomes (e.g., invasive species)?
- What are the areas of land and water within each biophysical region that will provide that provide the best opportunities for conservation actions for SGCN and habitats?
- Were planned conservation actions carried out?
- Are SGCN and habitats responding to the conservation actions as anticipated?
- How does new information compare with previous information or expectations?
- Who is implementing these actions?
- What are the costs of conservation actions?
- Are objectives consistently being achieved with outcomes as anticipated?
- How are stakeholders responding to conservation actions and Action Plan implementation?

Major guidelines for the development of this Action Plan monitoring program include:

**Collaboration:** Planning to develop and implement a Species of Greatest Conservation Need monitoring program should begin with collaboration. As with the design of conservation strategies in this report, successful monitoring of SGCN will require the help

and cooperation of many partners. Many current survey and monitoring efforts are conducted by interagency and inter-organizational efforts locally, regionally and nationally. These collaborations share expertise, make the best of limited resources, prevent redundancies of effort, increase the level of expertise of volunteers and improve program quality and effectiveness.

How much collaboration is needed? As many entities as possible should be brought together to develop consistent monitoring protocols and systems for data collection and data sharing, identifying indicators for species and habitats and goals and objectives for SGCN conservation.

The need for collaborative fund raising efforts cannot be overstated. Sufficient funds are imperative for monitoring to be effective. The State Wildlife Grants program currently is not sufficiently funded to finance the monitoring needs outlined here. Even if it was, state-side match is insufficient. A collaborative effort of agencies, conservation partners, local, state and federal elected officials, NGOs and private businesses and individuals is needed to develop adequate funding mechanisms at the state and federal levels.

**Coordination:** The coordination of monitoring programs, summarizing of results and sharing data with resources managers, researchers, local, state and national decision makers, educators, stakeholders and the general public will be essential to the success of a monitoring collaborative, to Action Plan efforts and to wildlife conservation in general. Solid coordination throughout the implementation phase will also make revisions of the Action Plan report straightforward and uncomplicated.

**Baseline data:** Distribution and abundance information for SGCN and their habitats are needed in order to establish meaningful baseline data. This data will be used to determine measurable goals and objectives that are the foundation of monitoring priorities.

**Indicators:** Monitoring every SGCN, their habitats, problems and the effects of conservation actions is too costly and time-consuming to ever complete. Relevant indicators that are measurable, precise, consistent, and sensitive are needed as coarse filters to make monitoring useful and manageable. Indicators should also be of appropriate scale, easily obtained and obvious in meaning so that results can be supported by a broad array of users.

**Citizen Science:** Successful monitoring projects such as VINS' Bird Atlas, Butterfly Survey and LoonWatch, the Vermont Reptile and Amphibian Atlas, Keeping Track Inc.'s big mammal monitoring, Audubon's Christmas Bird Counts, Marshbird Monitoring, and Great Backyard Bird Count and VFWD's Big Game Report Stations provide multiple benefits that should be considered in the development of new monitoring efforts. In addition to the direct benefits—improved wildlife knowledge—citizen-based monitoring also provides wildlife education through active field work on local projects, boosts awareness of and involvement in natural resource protection at the community level, and can be highly cost-effective.

## **Resources for Developing Vermont's Action Plan Monitoring Program**

### **Baseline Wildlife Data and Predictive Models for Wildlife Distribution and Land-Use Change:**

A long-term study by the VT Coop will soon help determine the distribution of a diverse array of terrestrial species: predict how land use will change over time; and, predict how occurrence of biodiversity will change in response to land use change (T. Donovan, VT Coop, personal communication). In 2003-2004 coordinated wildlife assessments (songbirds, reptiles, amphibians, and selected mammals—black bear, fisher, and bobcat) were conducted statewide. Results will inform predictive occurrence models for multiple taxa. Importantly, these surveys provide the first statewide, on-the-ground baseline data for monitoring changes in biodiversity over time. Land use change will be modeled under multiple policy scenarios, including no change in current policies. The corresponding impact on biodiversity will be quantified for each policy scenario. Finally, spatial optimization methods will be used to identify land use patterns that are optimal for conserving an array of species, subject to socio-economic constraints. The result will be a decision-making tool that informs stakeholders of how projected land use change scenarios will likely affect different levels of biodiversity. The Unit intends to repeat these surveys on a 5-10 year cycle for long-term monitoring purposes.

**Habitat-Based Monitoring for Assessing Conservation Strategies:** *Habitat Monitoring: an Approach for Reporting Status and Trends for State Comprehensive Wildlife Conservation Strategies* (Schoonmaker and Luscombe 2005) was commissioned by Defenders of Wildlife expressly to help states develop their Action Plan monitoring programs. This report provides a framework to track and assess the effectiveness of conservation actions and to adapt proposed conservation actions as needed in response to new information and changing conditions. It includes guidance for developing conservation goals, building habitat baseline data, and detecting changes over time to measure outcomes. Species monitoring is not addressed in detail. The paper stresses the importance of building a constituency of involved stakeholders and ensuring that the development of a wildlife conservation strategy and monitoring program is a goal-driven process.

**VMC as a Model for Coordination of Statewide SGCN Monitoring:** The Vermont Monitoring Cooperative (VMC) (<http://vmc.snr.uvm.edu>) is a collaborative partnership that collects and pools information and data on Vermont's forested ecosystems. Participating cooperators from government, academic and private sectors, conduct research projects on a variety of topics including forest health, air quality and meteorology, wildlife and aquatic systems. The VMC makes the data and results from these projects available to other scientists, educators, resource managers and the general public through its online data library and card catalogue containing the data and metadata from more than 100 projects.

**All-Bird Monitoring as a Model for Statewide SGCN Monitoring Programs:** The science and reach of bird monitoring far exceeds monitoring programs for other taxa. The "All-Bird monitoring" programs coordinated by North American Bird Conservation Initiative (NABCII) (<http://www.nabci-us.org/>) should be the bases for bird monitoring in Vermont. Furthermore the development of monitoring protocols for other taxa can benefit from a review of these bird monitoring programs.

**Reptile and Amphibian Monitoring:** In addition to Vermont's Reptile and Amphibian Atlas, two other initiatives are developing monitoring protocols for reptiles and amphibians.

Partners in Amphibian and Reptile Conservation (PARC) (<http://www.parcplace.org/>) and Amphibian Research and Monitoring Initiative (ARMI) (<http://armi.usgs.gov/>). Both entities should be involved in the development of monitoring plans for Vermont.

**Comprehensive Water Monitoring and Assessment Program:** To ensure that states are responsible for implementing the Clean Water Act, the U.S. Environmental Protection Agency (EPA) requires that states develop a comprehensive water quality monitoring and assessment program to track environmental conditions and changes over time, to help set levels of protection in water quality standards, and to identify problem areas that are emerging or that need additional regulatory and non-regulatory actions to support water quality management decisions (EPA 2003)

**Land Type Association Modeling/Mapping:** In 2005 the Vermont Department of Forest, Parks and Recreation, The Nature Conservancy and the US Forest Service have started a project to define Land Type Associations (LTA) throughout the state. Land Type Associations describe landscapes of matrix communities (1,000's of acres) based on factors such as bedrock and surficial geology and soil types. The primary purpose of this project is to correlate LTA's w/ insect and disease outbreaks to aid forest management. Data from this project, particularly the baseline mapping data, can be helpful to wildlife and habitat monitoring.

**The Montréal Process** is an international working group formed in 1994 to develop and implement internationally agreed upon criteria and indicators for the conservation and sustainable management of temperate and boreal forests <http://www.mpci.org/>.

**Data storage and data sharing:** The volume of government (local, state, federal), NGO, and private sectors data available for plants, animals, ecosystems, climate, geology, hydrology, social and economic that could be used to conserve wildlife is simply huge. The management, storage and accessibility of monitoring data will be a significant issue for any coordinated monitoring efforts. Vermont's NNHP manages much of the current wildlife data in collected in Vermont but the program is already understaffed. Additional resources that may be of assistance in data storage and data sharing include:

**The National Biological Information Infrastructure (NBII)** ([www.nbio.gov](http://www.nbio.gov)) is a broad, collaborative program led by the Center for Biological Informatics of the U.S. Geological Survey. The NBII links biological databases, information products, and analytical tools maintained by NBII partners and other contributors in government agencies, academic institutions, non-government organizations, and private industry. NBII facilitates also work on new standards, tools, and technologies that make it easier to find, integrate, and apply biological resources information.

**NatureServe:** ([www.natureserve.org](http://www.natureserve.org)) represents an international network of biological inventories—known as natural heritage programs and conservation data centers—operating in all 50 U.S. states, Canada, Latin America and the Caribbean (NNHP is the Vermont affiliate to NatureServe). NatureServe collects and manages data on rare, threatened and endangered plants, animals, and ecosystems, establishes scientific standards for biological inventory and biodiversity data management, and develops data management tools.

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## Action Plan: Implementation

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Congressional intent for the Wildlife Action Plan project is to identify and address the needs of all wildlife species in the state that might require help in order to prevent their becoming threatened or endangered. The full import of the word “comprehensive” becomes overwhelmingly clear as numbers in this report are tallied. (1,349 problems identified, 593 conservation strategies (setting the stage for hundreds or thousands of potential conservation actions), for 143 vertebrate species, 188 invertebrates, 577 plants and more than 100 habitat/community/landscape categories). The next steps, conducting the recommended research, setting species and habitat goals and objectives, implementing strategies and designing and implementing the monitoring programs outlined in this report requires the continued help and support of all conservation partners—those that participated in the Action Plan development and new partners as well.

Congress has designated state Fish & Wildlife Departments as Action Plan and State Wildlife Grants (SWG) custodians because they are the entities mandated by state law to manage and protect wildlife. Custodial responsibilities include not only delivering the completed Action Plan by Oct 1, 2005 but also for regular review and updating of the Action Plan report and administrating SWG funds. To carry out these responsibilities the VFWD will assign sufficient staff and resources to this program to manage projects, coordinate efforts and monitor overall program operations.

The VFWD will take the lead in coordinating the implementation of the research and monitoring recommendations and conservation strategies described in this report. While the department may be responsible for implementing much of the research, monitoring and conservation strategies, it will be Conservation partners, however, that may be the more logical and appropriate leaders for other research and strategy implementation, due to their skills and expertise, staffing, history, location, available resources and constituencies.

The Action Plan will remain a work in progress for many years, an experiment in long-term multi-species conservation on a scale not experienced before. Much of the work in this document is ground breaking. Many of the species examined here have not received focused attention before. The next few cycles of implementation, review and updating of individual strategies and the Action Plan report overall will be the particularly important for working out kinks, testing methods, and improving aspects of the Action Plan.

### Implementation and Participation

As a wildlife conservation plan for the entire state, the Action Plan includes some strategies that almost any individual or organization can implement. Any and all interested partners are encouraged to take part. Though many of these actions will not require the notification of VFWD, tracking the implementation and outcomes of each action is vital to the monitoring and adaptive management goals outlined elsewhere in this chapter. All participating partners are encouraged to consult with VFWD prior to taking action.

Impacts on other species, habitats and ecological processes and functions should always be considered when implementing conservation actions to benefit Species of Greatest

Conservation Need (SGCN). Implementation may also be subject to changing conditions and regulatory review (where required) and should be conducted in cooperation with land managers, land owners and key stakeholders. Large scale conservation efforts (e.g., broad scale monitoring) should be coordinated through VFWD, interagency workgroups and formal agreements where applicable.

## **Coordination and Collaboration**

As noted throughout this report, coordination of efforts is vital to leveraging available resources to ensure maximum wildlife benefit. VFWD will take the lead in facilitating communications among Conservation Partners, including local, state and federal agencies, through email networks, SWG annual reporting and a yearly conservation partner meeting open to any and all interested parties.

Coordination between states (regionally and nationally) will be spearheaded by the International Association of Fish & Wildlife Agencies (IAFWA) and the US Fish & Wildlife Service. Plans are already underway to help states effectively implement their Action Plans, to facilitate projects spanning multiple states and to improve agency capacity to implement their Action Plans (IAFWA 2005).

## **Prioritizing Conservation Need**

During the identification and assessment of SGCN our Action Plan technical teams began the process to prioritize conservation need through the following actions: SGCN were assigned either medium or high priority status (low priority species are deemed relatively secure for now, see Action Plan development, chapter 3 for ranking criteria), species conservation strategies, research and monitoring needs and habitat problems were ranked medium and high based on the combined expertise of each technical team.

We did not prioritize needs and strategies beyond this. The Action Plan is a conservation guide for the state—not only VFWD or the Agency of Natural Resources. It is meant to provide guidance to organizations, agencies and individuals who wish to conserve wildlife. The goals and missions of the many and varied partners involved in the project span a broad spectrum of wildlife interests, skills and reach (some are very local, others are state, regional and federal entities). It was clear that there would be no prioritization that would satisfy all partners and that conservation need is so great that there is room for everyone to select the species and habitats they find most important and implement the strategies they are most capable of working on.

When it comes to allocating SWG funds to specific projects, further prioritization is required. Prioritization will take into account the goal of the SWG program—to keep wildlife populations from declining to the point that they require protection under the federal Endangered Species Act (ESA)—and Congressional intent—that SWG funds benefit wildlife that have not historically been the primary beneficiaries of the Federal Aid in Wildlife Restoration Act, Federal Aid in Sport Fish Restoration Program or the federal ESA. Prioritization will also be based on the impact of problems to SGCN and habitats, the project's ability to affect positive change, other conservation and social impacts and the

availability of matching funds (see the draft process outlined below and Appendix J for the SWG Competitive Grants Proposal Evaluation form).

**Conservation Opportunity Areas:** The Action Plan monitoring program (discussed earlier in this chapter) will help identify areas of land and water within each biophysical region that provide the best prospects for conservation actions to benefit SGCN and their habitats. VFWD and partners can prioritize (though not limit) efforts on these "Conservation Opportunity Areas" in order to achieve a greater likelihood of success and to use limited conservation funds most efficiently.

### **Implementation Funds and Resources**

Most of the conservation strategies in this report are eligible for State Wildlife Grants program funds, and there is the rub. Conservation need and opportunity far outstrips current financial resources. To strategically allocate funds to the species and habitats in greatest need *and* to those projects that are likely to show the most promising results, we have drafted a process for soliciting, evaluating and selecting projects to receive SWG funding. That process is described in the next section below.

Agencies, organizations and individuals seeking funding for Action Plan conservation projects through sources other than SWG are encouraged to reference the Action Plan in grant applications and seek letters of support from other Conservation Partners including the VFWD. Entities wishing to implement conservation strategies should consider calling on the VFWD and other Conservation Partners for their expertise, advice, training and needed equipment and where appropriate collaborations should be considered.

### **Allocating State Wildlife Grant Funds**

Congress, through annual Interior Appropriations legislation has allocated funds to the State Wildlife Grants program yearly since 2001. Vermont's share of these appropriations has averaged approximately \$600,000 each year. Interior appropriations bills are generally approved in the fall of each year. In the spring of the following year VFWD submits proposals for use of SWG funds to the US Fish & Wildlife Service Division of Federal Assistance (USFWS-FA), the entity responsible for administering and managing the SWG program nationwide. Funds for accepted proposals are made available later that year and will generally remain available several years thereafter. A portion of each year's SWG appropriation will be made available to Conservation Partners for Action Plan implementation through a grants program. All eligible entities may submit applications.

The following is an outline of the draft schedule and process for applying and selecting recipients of SWG grant funds. Full procedures and proposal guidelines will be ready in October 2005.

## Timeline / Process (draft)

November: The VFWD determines the availability of funds for the coming year and the percentage of funds available for the SWG Small Grants program (this determination may be delayed if the federal budget is not approved on time, as is sometimes the case).

November/December: Meeting of Conservation Partners to discuss the past year's progress on Action Plan implementation and needs and opportunities for the coming year. Recommendations will be taken regarding the proportion of SWG funds to be allotted to conservation categories such as research, monitoring, habitat restoration, species recovery activities, etc. Final allocation will be determined by the VFWD Grants Committee (see below).

December: A request for proposals for use of SWG funds for Action Plan implementation will be announced by VFWD.

March Proposal submission deadline.

March-May Proposals will be reviewed as follows:

**SWG Coordinator** (VFWD staff): reviews proposals for completeness and eligibility. Complete proposals that meet the minimum eligibility standards are deemed accepted and are sent to the SWG Technical Committee.

**SWG Technical Committee** (VFWD staff and selected Conservation Partners): reviews & scores accepted proposals. Scoring will be based on draft criteria found here in Appendix J. The Technical Committee selects a slate of recommended proposals. All proposals are sent to the Grants Committee

**Grants Committee** (VFWD Division Directors and NNHP Coordinator): The Grants Committee selects finalists from both within and outside the Department based on proposal scoring, recommendations of Technical Committee, available funds and Department priorities.

**VFWD Commissioner**: receives finalists from Finalists are sent to the Commissioner for final approval.

## References

- Derr T., A. Moote, M. Savage, M. Schumann, J. Abrams, L. McCarthy, and K. Lowe. 2005. The Multiparty Monitoring Handbook Series. USDA Forest Service's Collaborative Forest Restoration Program. [www.fs.fed.us/r3/spf/cfrp/monitoring](http://www.fs.fed.us/r3/spf/cfrp/monitoring).
- IAFWA. May 2005. Memo Comprehensive Wildlife Conservation Strategies: National Support for Coordinated Implementation. Washington D.C.

## Action Plan Review

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Element number six of the eight required elements for an Action Plan (see Chapter 1: Congressional Guidelines) requires that states provide “descriptions of procedures to review the strategy at intervals not to exceed ten years.”

Vermont will update its Action Plan on a 10-year cycle. Ten years will allow for planning, and implementation of actions and for detectable responses for many SGCN. Vermont’s adaptive management approach to Action Plan implementation, however, means that species and habitat monitoring, formal project reporting and financial tracking will be ongoing and will provide a constant flow of information during the intervening years. Managers, wildlife planners and biologists will use this data to hone strategies, fine tune operations and make mid-course corrections within each ten year cycle. Review activities will include:

- Twice yearly expenditure tracking for individual projects by SWG project managers.
- Annual financial reporting of all in-kind match for individual projects by SWG project managers.
- Full project reports due within 90 days of completion of Individual SWG projects by SWG project managers.
- Providing regular Federal Assistance reports to the US Fish & Wildlife Service Division of Federal Assistance.
- A biannual Action Plan meeting for Conservation Partners will be organized by VFWD to review the year’s efforts, identify goals for the coming year and to share information about Vermont SGCN, successes, obstacles and needs related to wildlife conservation and Action Plan project implementation.
- A biannual report on the Action Plan to stakeholders, the general public and policy makers will review the past year’s efforts and outline goals for the coming year.

### Interstate Coordination and Information Sharing

With 49 other states and 6 territories all implementing their own Strategies in the coming months it is likely that there will be successful projects and programs that could benefit Vermont SGCN. There will undoubtedly be many regional and national efforts to share this information. Vermont should make it a priority to attend these meetings and perform a thorough review of methods and results from other states.

## Ten Year Review

The process to review and update the Action Plan in 2015 should begin at least two years prior to the deadline. The current thinking is that the review process should mirror the original Action Plan development process. This will include full participation by Conservation Partners (including local, state and federal agencies) on teams and committees, analyses of the work completed to date, evaluation of monitoring data and the updating of each of the eight elements from the original congressional guidelines as follows:

- 1) Revise the list of SGCN and update information on the distribution and abundance of SGCN. Which species can be removed from the list, which should be added?
- 2) Update information on the location and condition of key habitats. Describe key habitats of any new SGCN.
- 3) Describe threats and problems impacting SGCN and their habitats. Update research needs.
- 4) Review the success of conservation actions implemented to date. Identify conservation actions to conserve SGCN and their habitats.
- 5) Review Action Plan monitoring efforts to date. Describe plans to monitor species, habitats and conservation actions for the future.
- 6) Update and describe the process for the next plan review.
- 7) Review coordination efforts to date. Update plans to coordinate with other plans and planning entities.
- 8) Revise and describe plans to include the public in the design and implementation of the next Action Plan report.

