Chapter 8

Revising Vermont's Wildlife Action Plan

2015

Revising Vermont's Wildlife Action Plan

The revision Vermont's Wildlife Action Plan began in earnest January 2013 when a Revision Team of Vermont Fish & Wildlife Department staff met to begin project scoping. Federal guidelines, planning literature and past planning efforts were reviewed and an organizational structure and revision process were subsequently developed. Prior to this, in 2012 VFWD conducted assessments of vulnerability to climate change for 18 species and 44 habitats. The identification of Species of Greatest Conservation Need (SGCN) occurred from July 2014 through January 2015. Habitat delineation for SGCN, problem assessment and strategy development occurred from October 2014 through June 2015. Integration and conservation planning ran from May through August 2015. Review and additional input by the Department, agencies and other stakeholders and the public, occurred between September and November 2015. Final document preparation and editing occurred in December 2015.

The Planning Team reaffirmed five primary goals used to guide its first Wildlife Action Plan as the revision's guiding framework, and added two additional goals:

1. Conserve, enhance and restore Vermont's wildlife and wildlife habitat.
2. Represent good science and conservation planning.
3. Identify conservation priorities yet remain flexible and open to new opportunities.
4. Develop the Action Plan for the entire state; one that all agencies, organizations and individuals can find useful.
5. Build and support advocates for wildlife conservation.
6. Build on the good work of the first Wildlife Action Plan.
7. Develop the Action Plan in a manner that will support regional roll-up of Wildlife Action Plan information among member states of the Northeast Association of Fish & Wildlife Agencies per the Northeast Lexicon (Crisfield 2013) for improved regional conservation.

The Planning Team recognized that meeting these goals required the resources, participation and ingenuity of many conservation-minded individuals, organizations and agencies. This in turn required a development process that included conservation partners to the greatest extent possible. Six teams of taxonomic experts (Species Teams) and a Landscape Team and were created to develop the Wildlife Action Plan. Team members are listed in table 8.1.

Species Teams: (selected Fish and Wildlife staff and other taxonomic experts). Six Species Teams were created: Amphibian & Reptile (Herps), Bird, Fish, Invertebrate, Mammal, and Plant. These teams developed and refined lists of Species of Greatest Conservation Need; assessed species distribution and abundance, identified habitats, communities, threats and actions; developed monitoring and performance measures.

Landscape Team: (selected Fish and Wildlife staff and conservation partners with expertise in GIS, landscape assessment and conservation design). The Landscape Team was charged with developing a landscape-level conservation design for the state, one that would address the needs of most, if not all, Species of Greatest Conservation Need.

Table 8.1: Team and Committee Members, Wildlife Action Plan Revision

*Denotes team/committee chairpersons

Vermont Action Plan Revision Team		**Bird Team**	
Steve Parren*	VT Fish & Wildlife Dept	John Buck*	VT Fish & Wildlife Dept
Ken Cox	VT Fish & Wildlife Dept	Dr. William Barnard	Norwich University
Steve Gomez	VT Fish & Wildlife Dept	Chip Darmstadt	North Branch Nature Center
Jon Kart	VT Fish & Wildlife Dept	Margaret Fowle	Audubon VT
Eric Sorenson	VT Fish & Wildlife Dept	John Gobeille	VT Fish & Wildlife Dept.
Susan Warner	VT Fish & Wildlife Dept	Mark LaBarr	Audubon VT
Lael Will	VT Fish & Wildlife Dept	Sally Laughlin	First VT Bird Atlas
		Dr. Rosalind Renfrew	VT Center for Ecostudies
Planning Team		David Sausville	VT Fish & Wildlife Dept
Steve Parren*	VT Fish & Wildlife Dept	Dr. Allan Strong	University of Vermont
Jon Kart	VT Fish & Wildlife Dept	Erin Talmadge	Birds of VT Museum
Christopher Hilke	National Wildlife Federation		
Municipal Planning Team		**Fish Team**	
Jens Hilke*	VT Fish & Wildlife Dept	Kenneth Cox*	VT Fish & Wildlife Dept
Monica Przyperhart	VT Fish & Wildlife Dept	Dr. William Barnard	Norwich University
Kate McCarthy	VT Natural Resources Council	Dr. Douglas Facey	Saint Michael's College
		Mark Ferguson	VT Fish & Wildlife Dept
Landscape Steering Committee		Eric Howe	Lake Champlain Basin Program
Eric Sorenson*	VT Fish & Wildlife Dept	Richard Langdon	VT Dept of Environmental Conservation
Jens Hilke*	VT Fish & Wildlife Dept	**Invertebrate Team**	
Bob Zaino*	VT Fish & Wildlife Dept	Mark Ferguson*	VT Fish & Wildlife Dept
Liz Thompson	Vermont Land Trust	Steve Fiske	VT Dept of Environmental Conservation
John Austin	VT Fish & Wildlife Dept	Trish Hanson	VT Forest Parks & Recreation Dept
Jayson Benoit	NorthWoods Stewardship Ctr	Kent McFarland	VT Center for Ecostudies
Jeff Briggs	VT Forest Parks & Recreation Dept	Bryan Pfeiffer	Consulting Entomologist
Dan Farrell	The Nature Conservancy		
Jon Kart	VT Fish & Wildlife Dept	**Mammal Team**	
Jane Lazorchak	VT Fish & Wildlife Dept	Chris Bernier*	VT Fish & Wildlife Dept
Paul Marangelo	The Nature Conservancy	Alyssa Bennett	VT Fish & Wildlife Dept
Doug Morin	VT Fish & Wildlife Dept	Dr. William Kilpatrick	University of Vermont
Steve Parren	VT Fish & Wildlife Dept	Dr. James Murdoch	University of Vermont
Nancy Patch	VT Forest Parks & Recreation Dept	Dr. Peter Smith	Green Mountain College
Rose Paul	The Nature Conservancy	Christopher Spatz	Cougar Rewilding Foundation/NE Wolf Coalition
Kim Royar	VT Fish & Wildlife Dept		
Mark Scott	VT Fish & Wildlife Dept	**Plant Team**	
		Bob Popp*	VT Fish & Wildlife Dept
Amphibian & Reptile Team		Everett Marshall*	VT Fish & Wildlife Dept
Doug Blodgett*	VT Fish & Wildlife Dept	Charlie Hohn	VT Fish & Wildlife Dept.
Jim Andrews	VT Herp Atlas	Aaron Marcus	VT Fish & Wildlife Dept
Steve Faccio	VT Center for Ecostudies	Eric Sorenson	VT Fish & Wildlife Dept
Chris Slesar	VT Agency of Transportation	Bob Zaino	VT Fish & Wildlife Dept

Threats, Problems and Species of Greatest Conservation Need

Defining Threats and Problems

Element number three of the eight congressionally required elements of a Wildlife Action Plan requires that states: describe the problems that may adversely affect Species of Greatest Conservation Need or their habitats and priority research and survey efforts needed to identify factors which may assist in restoration and improved conservation of these species and habitats. Problem and threats are defined as follows:

> **Problem:** Something that is a concern and could cause a negative impact at the species, population, habitat and/or landscape levels (e.g., habitat conversion, pollution, illegal pet trade). A problem can also be the lack of information or a data gap vital to the successful management of a species.
>
> **Threat (direct):** Processes or human activities "that have caused, are causing, or may cause the destruction, degradation, and/or impairment of biodiversity targets" (adapted from Salafsky et al. 2008).
>
> **Threat (indirect):** The factors contributing to or enabling direct threats. Typically, there is a chain of contributing factors behind any given direct threat. Synonyms include contributing factors, underlying factors, drivers, and root causes (adapted from Salafsky et al. 2008).

For the purposes of this report, problem and threat are used in a similar or related manner. For each Species of Greatest Conservation Need in the Action Plan we identified priority problems. Priority research needed to evaluate other potential problems was also identified. They are detailed in SGCN conservation reports (Appendix A) and in habitat/ community summaries (Appendix B).

Each of the threats and problems identified in the Action Plan was assigned to one of 24 categories roughly grouped into habitat-related factors and non-habitat-related factors. These categories make it possible to search our database for similar factors impacting other species. It also makes it easier to roll-up for broad scale conservation planning. The categories were cross-walked (Appendix C) with those developed by the International Union for Conservation of Nature and Natural Resources (IUCN) (Salafsky et al. 2008) to aid in the regional roll-up of Action Plan data as recommended by the Diversity Technical Committee of the Northeast Association of Fish & Wildlife Agencies (Crisfield 2013).

The categories are not mutually exclusive and threats can often logically be placed into more than one category depending on the stress it causes for a species or habitat. For example, a road can fragment the habitat of grassland nesting birds, cars traveling the road can injure or kill amphibians that were crossing the road to mate in an adjacent pool, and salt spread on the road to prevent icing can wash into a stream impacting its population of Brook Trout. In this example, the threats stemming from the road would be recorded in the "Habitat Fragmentation," "Impacts of Roads & Transportation Systems," and "Pollution" categories.

Threats are often species and/or habitat specific. What may negatively impact one species may benefit another. For example, if a cold-water stream with a healthy Brook Trout

population was dammed it might no longer support Brook Trout. That impact to the dam would be described as the "conversion of habitat" category. However, the reservoir created by the dam might make it more suitable for a warm water fish species.

Threats/problems to SGCN are described in narratives in each Species Conservation Report (appendices A1-A5). Better known species generally received fuller problem descriptions. For some poorly understood SGCN descriptions of threats/problems were less specific. Species Teams have in some cases provided consensus recommendations of problems as a starting place for future research. Clearly life is too complex to be placed into any one box. Therefore, it is important to read the full description of a factor affecting a species or habitat in the appropriate species or habitat summary.

Threat Categories

See Appendix C for definitions of each category. For context, see Appendix A for SGCN conservation reports and Appendix B for habitat/community summaries.

Habitat-Related Threat/Problem Categories

- Climate Change
- Habitat Alteration/ Degradation
- Habitat Conversion
- Habitat Fragmentation
- Hydrologic Alteration
- Impacts of Roads & Transportation Systems
- Impacts of Energy Infrastructure & Development
- Inadequate Distribution of Successional Stages
- Inadequate Disturbance Regime
- Invasion by Exotic Species
- Parcelization
- Sedimentation

Non-Habitat-Related Threat/Problem Categories

- Competition
- Disease
- Genetics
- Harvest or Collection
- Incompatible Recreation
- Loss of Food Base or Prey Base
- Loss of Relationship with Other Species
- Parasitism
- Pollution
- Predation or Herbivory
- Reproductive Traits
- Trampling & Direct Impacts

Conservation Action Development

Element number four of the eight congressionally required elements of a Wildlife Action Plan requires that states describe "conservation actions proposed to conserve the identified species and habitats and priorities for implementing such actions."

We identified actions to address the threats and problems impacting each of Species of Greatest Conservation Need (SGCN) and their habitats. Selected actions are based on the best science available today as well as a strategic assessment of needs and priorities of all wildlife species. In the coming years, as monitoring data on SGCN and conservation actions becomes available, as priorities change, or new threats or opportunities arise, actions may need to be revisited. Not every action in this report will be eligible for State Wildlife Grant funding. Furthermore, it may not be suitable, or feasible, for the Vermont Fish & Wildlife Department to implement some of the actions in this report, however, some conservation partners may find them fitting and practical.

Actions are described in short narratives in each SGCN conservation reports (Appendix A) and in each habitat, community and landscape summary (Appendix B). Actions are intentionally broad and directional to balance the need to guide implementation with the need to maintain relevance and flexibility through the life of the Action Plan (~10 years). For example, an action such as "provide technical assistance to landowners to maintain or improve riparian habitat for Species of Greatest Conservation Need" allows for different approaches to providing that assistance and leaves the door open to a variety of providers to implement. Where action implementation is to be funded by the State Wildlife Grant program the approach should be consistent with the Department's mission and strategic plan, and precise procedures will be detailed in operational plans once the Action Plan is finalized.

Vermont's Action Plan was designed for the state, not just the Fish & Wildlife Department. While the VFWD may be responsible for implementing many of the actions in this report, it could be conservation partners that are the more logical and appropriate leaders for others, due to their skills and expertise, staffing, history, location, available resources and constituencies.

Each of the actions identified in this report were assigned to one of 27 categories in six major classes. The categories were developed by the Conservation Measures Partnership (Salafsky 2005) as a means of standardizing terminology (not practices) among conservation practitioners worldwide. Many states have used these same categories to organize the strategies and actions in their Action Plan. They have also been incorporated into Wildlife TRACS (Tracking and Reporting Actions for the Conservation of Species) the US Fish & Wildlife Services' system for tracking and reporting conservation activities. States, including Vermont, will use TRACS for all work funded through the USFWS once it is fully operational.

The action categories are used solely for organizing and grouping strategies developed by Action Plan teams and committees. It was not our goal to create strategies for every category. A few categories were not applicable to the species or habitats in Vermont whereas others were deemed not as effective. Definitions for each strategy can be found in Appendix C.

Outreach and Public Involvement

The Vermont Fish & Wildlife Department recognized that to meet our Action Plan revision goals that we needed the resources, participation and ingenuity of our conservation partners. More than 30 partners representing 20 different organizations and agencies participated on the landscape team or one of the taxonomic teams.

Additional outreach and public involvement efforts focused on the following groups:

Public: The general public has been kept informed about the State Wildlife Grants and Wildlife Action Plan several ways. These include: ongoing publications of two Department newsletters (*Fish & Wildlife Conservation News* and *Natural Heritage Harmonies*), a website dedicated to Vermont's Action Plan (www.vtfishandwildlife.com/SWG_home.cfm); presentations to conservation and wildlife oriented organizations, lectures at the University of Vermont; postings to listserves such as Vermont's science teacher listserve, and the general news and recreation media. Our public outreach goals were to inform the public that: wildlife may be at risk without our help and without adequate funds to conserve them; that with the financial support of State Wildlife Grants program, the Vermont Fish and Wildlife Department and Conservation Partners are developing strategies to conserve Vermont's wildlife; and; the public could view a draft Action Plan and provide comments in summer 2015.

Endangered Species Committee: The Endangered Species Committee (ESC) is a standing citizens committee of the Agency of Natural Resources. It advises the Agency Secretary on issues concerning the State's listed and potential endangered and threatened species. The committee reviews the endangered and threatened species list and makes recommendations to the Secretary about amendments and ways to protect listed species. The ESC is supported by taxa-specific Scientific Advisory Groups (SAGs). Positions on the ESC and SAGs are filled by experts from local, state and regional organizations, agencies and education/research facilities. The Endangered Species Committee was briefed on the Action Plan early in the process. Several ESC and SAG committee members serve as Species Team members.

Coordination with Other Agencies & Native American Tribes

Congressional guidelines require that each state Action Plan "coordinate the development, implementation, review and revision of the Action Plan with federal, state and local agencies and Indian tribes that manage significant land and water areas within the state or administer programs that significantly affect the conservation of identified species and habitats."

Native American Tribes: There are no federally recognized Native American tribes that manage significant land and water areas within Vermont or administer programs that significantly affect the conservation of Species of Greatest Conservation Need or their habitats. According to information provided by the USFWS, the Stockbridge-Munsee Band of the Mohican Nation, based in Wisconsin, has interests in ancestral in Vermont. We invited the Stockbridge-Munsee Band to participate in Action Plan revision twice (11/24/2014 and 3/20/2015) but our invitations were not accepted.

There are, however, four bands of the Abenaki Tribe recognized by the state of Vermont: the Elnu Abenaki Tribe, the Nulhegan Abenaki Tribe, the Abenaki Nation at Missisquoi and

the Koasek Traditional Band of the Koas Abenaki Nation. These tribes were encouraged to take part in the development of the Action Plan as Conservation Partners and through the public input process.

Development: More than 190 representatives of local state and federal agencies and non-governmental organizations concerned with wildlife and land conservation and management (Conservation Partners) were contacted about participation in Wildlife Action Plan revision. Representatives of 21 of these agencies and organizations serve on Action Plan technical teams (Table 8.1). Several provided data used in the Action Plan development. Many reviewed the draft Action Plan and provided comments. Additionally, municipal planners and municipal conservation commissioners were also invited to review drafts of the municipal planning guide (Mapping Vermont's Natural Heritage—appendix G).

Conservation Partners were kept informed of the ongoing developments in the Action Plan through email, meetings and phone calls. Presentations and briefings were made to the Department of Forests, Parks and Recreation, the Department of Environmental Conservation (Divisions of Wetlands, River Management, Lakes & Ponds); the Vermont Agency of Transportation, the Lake Champlain office of the U.S. Fish & Wildlife Service, the U.S. Forest Service's Green Mountain National Forest, the Vermont Forest Roundtable and others.

The public was invited to review and comment on the draft Wildlife Action Plan. Outreach to the public occurred via press releases, news interviews, postings to the VFWD website and Facebook pages and via listserves and newsletters of partner organizations. A Wildlife Action Plan Revision website (http://www.vtfishandwildlife.com/cms/one.aspx?portalid=73163&pageid=480687) was created to provide additional information and direct access to the Action Plan drafts.

Implementation, Review & Revision: All Conservation partners, including federal, state and local agencies will be encouraged to take part in the implementation, review and revision of the Action Plan. Plans for these steps can be found in chapter 7 Vermont's Action Plan: Implementation and Review.

Species & Habitat Conservation

Identifying Species of Greatest Conservation Need

Congress created the State Wildlife Grants program (SWG) in 2001 with the goal of preventing wildlife populations from declining to the point of requiring Endangered Species Act protections. To receive SWG funds, state and tribal fish and wildlife agencies agreed to develop statewide Wildlife Action Plans. Congress directed that the Action Plan identify and be focused on the "Species of Greatest Conservation Need."

Congress left it up to each state to identify their Species of Greatest Conservation Need (SGCN). The State Wildlife Grants program defines wildlife as "any species of wild, free-ranging fauna including aquatic species and invertebrates as well as native fauna in captive breeding programs intended for reintroduction within its previously occupied range." Furthermore, it was Congress' intent that SWG assist wildlife that "have not previously benefited from other federal wildlife conservation and management programs" (e.g., Federal Aid to Wildlife Restoration Act, Federal Aid in Sport Fish Restoration Act, or the Endangered Species Act). In Vermont, SGCN include:

- Species with declining populations;
- Species threatened or potentially threatened; and,
- Species that are so little known in the state that experts cannot yet ascertain status.

Though plants are not eligible for State Wildlife Grants Program funding, Vermont's Action Plan does include plant SGCN. Plant-specific conservation strategies, if and when they are implemented, will be funded through mechanisms other than SWG. Several game and sportfish species are identified here as SGCN. Other established funding programs for the conservation of these species may be used before using SWG.

Vermont began its process of identifying Species of Greatest Conservation Need (SGCN) with a systematic review of all its known wildlife. The review considered both the well-known wildlife species supported by large datasets and poorly understood species.

The six Species Teams (Amphibian & Reptile, Bird, Fish, Invertebrate, Mammal and Plant) conducted the reviews and selected SGCN using the review criteria in table 8.2. They were provided lists of species found in Vermont within their respective taxa (the Invertebrate team received the most up-to-date invertebrate list available, but it is widely accepted that a complete list of the estimated 21,000 invertebrates in Vermont may never be possible. The lists and supporting information were developed by the VFWD's Wildlife Diversity Program using its Natural Heritage Database and augmented with other databases, records and information from NatureServe, universities and research facilities, regional and national monitoring efforts, published literature and the knowledge of technical experts. The following groups had major, taxon-wide State rarity rank reviews: Amphibians & Reptiles (2007), Bumble Bees (2014), Birds (2010), Fishes (2005), Bats (2011), Other small mammals (2008), moths and butterflies (2010), dragonflies and damselflies (2008) and Vascular Plants (2014). Ranks for individual species were updated as needed.

Table 8.2: Review Criteria for Identifying Species of Greatest Conservation Need

Category	Criterion	Allowed Response	Definition/example
Species that are rare or declining	State and/or Federally listed Threatened or Endangered species	Endangered, Threatened, Special Concern [See Appendix J for definitions of T& E status and ranks]	E: Endangered: in immediate danger of becoming extirpated in the state T: Threatened: with high possibility of becoming endangered in the near future. SC: Special Concern: rare; status should be watched
	Rare and very rare species	S-Ranks S1,S2 [See appendix J for definitions of T& E status and ranks]	S1: Critically imperiled (very rare): At very high risk of extinction or extirpation due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors. S2: Imperiled (rare): At high risk of extinction or extirpation due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors
	State Trend	Stable, Fluctuating, Declining, Increasing, Unknown	Based on research data such as BBS routes, other monitoring and best judgment of experts
	Regionally Rare	Yes/No/ Unknown	Based on regional and national research, BBS routes, other monitoring and consensus within technical teams.
	Extirpated in Vermont	Yes/No/ Unknown	
Vulnerable species at risk due to any of the following	Habitat Loss/Conversion/fragmentation	Yes-development, Yes-succession, Yes-natural causes, No, Unknown	Species negatively affected by habitat conversion, degradation, fragmentation or succession
	Life-history traits making the species vulnerable	Yes/No/ Unknown	Species with low fecundity, that take a long time to reach sexual maturity, that take a long time between reproductive events (e.g., sturgeon, wood turtle)
	Species vulnerable to taking	Yes-Regulated, Yes-Unregulated, No, Unknown	Hunting, trapping or collection, legal or otherwise.
	Species vulnerable to other deadly contact with humans	Yes/No/ Unknown	Road kill (bobcat, turtles), wind turbines (birds, bats) contaminates (fish) etc.
	Species w/ limited, localized at-risk populations	Yes/No/ Unknown	Populations that cannot or do not intermix with the meta-population. E.g., non-vagile invertebrates in a sandplain community and perhaps spruce grouse.
	Species significantly impacted by exotics	Yes/No/ Unknown	Impact may lead to elimination of populations, limits to long-term stability, extirpation
Species or species groups w/ unknown status or taxonomy	Unknown status-more data is needed	Yes/No/ Unknown	
	Species w/ taxonomic uncertainties	Yes/No/ Unknown	

Category	Criterion	Allowed Response	Definition/example
Other factors to consider	Keystone species	Yes/No/ Unknown	Species with a disproportionately strong influence on ecosystem functioning and diversity (Power et al.1996).
	Responsibility species	Yes/No/ Unknown	Species for which Vermont has a long-term stewardship responsibility because they are not doing well regionally, even if populations are stable in Vermont (e.g., Bobolink)
	Endemic species	Yes/No/ Unknown	Species found only in Vermont
	Relationship to core population	central peripheral, disjunct, unknown	
	Requires rare or specialized habitats	Yes/No/ Unknown	A species with a very narrow niche, e.g., a species requiring a host plant found only in a handful of serpentine rock outcrops.
	Species with limited dispersal capability	Yes/No/ Unknown	Non-vagile species in dispersed habitats.
	Requires key Vermont migration stopover points	Yes/No/ Unknown	
	Species selected based on expert opinion	Yes/No	Combined opinion of the team.
	Actively managed? (if so list applicable plan(s)	Yes-Mgt plan exists, Yes-regulated, No	Does a management plan exist for the species or species group? (E.g., an osprey plan, waterfowl plan, species recovery plan.)
Secure?	Species Secure	Yes/No/ Unknown	Combined opinion of the team
	Final Assessment	High, Medium, Low Priority	

Once the reviews were complete the Species Team selected SGCN using selection criteria found in Table 8.3. Species were assigned conservation priorities of high, medium or low. Species ranked medium and high constitute Vermont's Species of Greatest Conservation Need. Low priority species were considered secure. There were a few cases where a specific Species Team approached their tasks differently:

Bird Team: An unusually rich collection of data and prior conservation planning efforts are available for bird conservation—far more than is available for other taxa, including the second Vermont Breeding Bird Atlas (2013), the USFWS Breeding Bird Surveys and information from Partners-In-Flight, North American Bird Conservation Initiative, National Audubon Society's Watch List, and the American Bird Conservancy's Green List.

Invertebrate Team: It is estimated that Vermont is home to approximately 21,000 invertebrate species (McFarland, pers comm). The clear majority are un-cataloged, un-studied and just plain unknown. Application of the review criteria to invertebrates on a species-by-species basis would be unproductive. Instead the Invertebrate Team interviewed additional experts within Vermont, regionally and nationally to help in the identification of species and Species Groups of Greatest Conservation Need. The team also took advantage of several significant advances made since (and because of) the adoption of Vermont's first Wildlife Action Plan in 2005, including: the Vermont

Butterfly Atlas, a Peatland and Large River Odonate Survey and the Vermont Bumble Bee Survey.

Plant Team: The Plant Team also had to contend with a huge list of species—more than 1,500 vascular plants (Flora 1993) and 600 bryophytes (Allard 2004). The team took advantage of plant conservation assessments previously conducted by the Agency of Natural Resources' Endangered Species Committee to create its list of Species of Greatest Conservation Need. All species ranked S1 (critically imperiled) and S2 (imperiled) became SGCN. Those SGCN also on the New England Plant Conservation Program list of regionally rare plants were then ranked High Priority. All others were ranked medium priority.

Table 8.3: Criteria for Selecting Vermont's Species of Greatest Conservation Need

Because the circumstances, issues and problems impacting each species differ, teams were given some flexibility in assigning ranks to species.

Species (and Species Groups) of Greatest Conservation Need	**High Priority**	Species that are vulnerable (rarity is an aspect of vulnerability).
		Species with immediate limits to its survivability based on known problems and/or known impacts to the population
		Species exhibit negative population trends.
		Species may be extirpated locally (Vermont) but still exist regionally.
	Medium Priority	Species may be well distributed and even locally abundant, but populations are challenged by factors that increase mortality or habitat loss and therefore threaten the species in Vermont.
		Consider what is known about the species regionally.
		Since this may be the most difficult category to assign species to, there should be a consensus among group members.
Common Species	**Low Priority**	Species is secure for the immediate future.
		Species may be vulnerable to some mortality and/or problems (e.g., habitat degradation) but population is abundant enough to tolerate negative forces

The list of Species of Greatest Conservation Need includes 132 vertebrate species (out of a total of 468), 200 invertebrate species or groups (out of an estimated 21,000) and 645 plant species out of approximately 1,500 vascular and non-vascular species. Table 8.4 provides summary statistics.

Table 8.4: Summary Statistics for Vermont's Species of Greatest Conservation Need

High and medium priority-ranked species constitute Vermont's SGCN.
*21,400 is the estimated number of Vermont invertebrates
** This low percentage reflects the large number of invertebrates whose conservation status is unknown

	Total species in VT	High Priority SGCN	Medium Priority SGCN	Total SGCN	% SGCN of total VT Species
Amphibians & Reptiles	40	12	7	19	47%
Birds	269	29	22	51	19%
Fish	94	13	16	29	31%
Invertebrates*	21,400*	139	59	198	0.93%**
Mammals	61	17	16	33	57%
Plants	1500	238	431	669	45%
Total	**23,364**	**432**	**543**	**977**	**4.29%**

Conservation of Species of Greatest Conservation Need

Fine Filter-Species

Once Species of Greatest Conservation Need were identified, Taxa Teams developed conservation summaries each SGCN. Reports identified species distribution, habitat needs, problems affecting species and their habitats, research and monitoring needs and conservation strategies for each SGCN (Congressionally required elements #1-#5). Invertebrate SGCN were addressed in groups rather than as individual species. Fifteen invertebrate groups were created based on taxonomy (e.g., Bumble Bees, Crustaceans, Tiger Beetles) and habitat use (e.g., freshwater, grasslands, hardwood forests). Individual conservation summaries were not developed for plant SGCN but a taxon-wide summary is provided in chapter 5. All data was entered into the Action Plan database.

Distribution for all SGCN was identified by biophysical region (Girton & Capen 1997) using terminology consistent with VFWD's element occurrence tracking procedures. Distribution of fish SGCN and some additional aquatic SGCN were also identified by 8-digit watershed unit (NRCS 2009). Historic occurrence was noted in a narrative for some of the rarer and extirpated SGCN.

Habitat descriptions for SGCN include a narrative, elevation preferences, migrant status, home range and patch size requirements and landscape requirements (e.g., corridor needs, habitat mosaics or wetland complexes, preference for managed or passively managed forest, large grasslands or developed landscapes).

Research and monitoring were also identified and prioritized for each animal SGCN.

Priority threats and potential risks to Species of Greatest Conservation Need were enumerated for each species. These were not exhaustive lists of all possible problems. Teams identified only those factors posing significant and potentially significant threats for a species. A narrative description was entered into the database. Species teams also assigned each problem to one of 24 habitat related and non-habitat related problem categories (Appendix C). These categories have been cross-walked with those developed by the International Union for Conservation of Nature and Natural Resources (IUCN) (Salafsky et al. 2008) to aid in the regional roll-up of Action Plan data as recommended by the Diversity Technical Committee of the Northeast Association of Fish & Wildlife Agencies (Crisfield 2013).

Species specific conservation actions were also developed by the Species Teams. Actions were designed to address identified threats. Actions were assigned either a "medium" or "high" priority status (low priority actions are not included in the Action Plan) and each strategy was also assigned to a category (Salafsky 2004) to aid in organizing and review of actions (Appendix C).

Actions were not prioritized beyond this step. As a conservation guide for the state, Vermont's Action Plan is meant to provide guidance to organizations, agencies and individuals wishing to conserve wildlife. The varied goals and missions of the partners involved in the Action Plan span a broad spectrum of wildlife interests, skills and reach (some are local; others are state, regional and federal entities). While no prioritization scheme was found that satisfied all partners, the conservation need is deemed so great that there is

room for everyone to select the species and habitats they find most important and implement the actions they are most capable of working on.

Coarse Filter-Conservation at Multiple Scales

To aid in the development of community and landscape level conservation actions, each SGCN was assigned to at least one of more than 100 habitat types (natural communities, aquatic habitats, cultural habitats and or landscapes). These habitats were grouped into 24 major categories (Chapter 4. table 4.1) and conservation summaries were developed for each. The summaries include descriptions and general locations; current conditions; desired conditions based on the needs of associated SGCN; prioritized threats and conservation actions, potential conservation partners and funding sources for action implementation; and, a listing of other relevant plans and planning processes.

Threats and problems described in the habitat summaries (and in species summaries) are not comprehensive. Only those problems ranked as medium and high are included in this report. This was a strategic decision to focus attention on those threats and problems determined or perceived to be most important. If additional problem(s) are later identified as significantly impacting a species or habitat it will be incorporated into the Action Plan database during project review and reporting. Actions and actions to address additional problem(s) will also be eligible for SWG funding.

Habitat Classification & Ecological Divisions

"Wetland, Woodland, Wildland - A guide to the natural communities of Vermont" (2000) by Thompson and Sorenson was used as the basis for terrestrial natural communities. Forest cover types (Eyre 1980) and U.S Forest Service Forest Inventory & Analysis types (USDA 2003) were used for early successional and managed forests. "A Classification of the Aquatic Communities of Vermont" by Langdon et al. (1998) was used as the basis for aquatic habitat designations and Reschke (1990) was adapted for cultural habitats.

SGCN distribution was identified to biophysical region (Girton & Capen 1997) and 8-digit watersheds (NRCS 2003). These landscape units were selected in part because they will integrate well with other conservation efforts within the state and regionally. Biophysical regions can be considered a sub-unit of the Bailey's section (Bailey 1995, Bailey 1998) providing finer grain detail. Data can be integrated into Bailey's sections to aide in regional, national and international conservation efforts.

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