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# THE NORTHEAST LEXICON: TERMINOLOGY CONVENTIONS AND DATA FRAMEWORK FOR STATE WILDLIFE ACTION PLANS IN THE NORTHEAST REGION

## ABSTRACT

State Wildlife Action Plans have been required for federal funding of conservation actions through the Wildlife Conservation and Restoration Program and the State Wildlife Grants Program since 2005 but there is growing recognition of the value of this comprehensive and strategic approach beyond the funding context. In particular, the potential of these state plans to enhance interstate collaboration for habitat management and biodiversity conservation is evident. To facilitate this collaboration, the states in the northeastern U.S. developed a common lexicon for State Wildlife Action Plans which will make possible a regional database of Species of Greatest Conservation Need (SGCN), threats these species face, habitats they rely on, and conservation actions proposed to support their populations. A thorough review of existing systems and a survey of northeastern states were used to develop this set of common terminology. Here we describe a menu of criteria for screening species to be included on lists of SGCN and a set of basic information to document SGCN in a regional database. Regional habitat classification systems for terrestrial and aquatic systems were adopted for use in State Wildlife Action Plans. Northeast region states have adopted the international standard for classification of threats (IUCN) along with a qualitative assessment of urgency, severity, extent, and reversibility. The US Fish and Wildlife Service Wildlife TRACS classification system for conservation actions was adopted as a naming convention and elements of a detailed description to improve the clarity of conservation actions based on S.M.A.R.T. goals and results chain planning were also recommended. National guidance for assessing project results, along with an agreement to utilize standard protocols for species' population and habitat quality assessment whenever possible, constitute the guidance for Element 5, Monitoring. Elements 6-8, related to plan review and public participation rely on existing guidance, leaving states with considerable flexibility. This Northeast Lexicon will improve inter-state communication, facilitating regional planning processes and helping states compare species, habitats, threats, actions, and monitoring plans to find opportunities for collaboration.

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## EXECUTIVE SUMMARY

The Northeast Lexicon provides a customized language and data framework for required elements of State Wildlife Action Plans. The Lexicon was proposed and developed by the Fish and Wildlife Diversity Technical Committee of the Northeast Association of Fish and Wildlife Agencies to facilitate inter-state planning in the Northeast Region. State Wildlife Action Plans have the potential to enable states to learn from each other and to allow the region to determine shared threats and priorities – but the diversity of the content and format of the 2005 plans prevented the region from realizing this vision. The Northeast Lexicon establishes a common language and data framework for State Wildlife Action Plans, without prescribing planning procedures or requirements thereby providing both flexibility and guidance to states for their 2015 plan revisions.

The process to develop this common language included extensive research on existing language and planning systems (Appendix A) and a survey of northeastern states tested receptivity and brought prior experience and knowledge to bear on the Lexicon development (Appendix B). The Association of Fish and Wildlife Agencies' *Best Practices for State Wildlife Action Plans* (hereafter "Best Practices Report") also strongly influenced the choices made in the Northeast Lexicon. A series of meetings, with State Wildlife Action Plan Coordinators and Wildlife Diversity Program managers working together to develop a viable Lexicon that balanced regional consistency and state flexibility, ended with the September 2013 meeting of the Fish and Wildlife Diversity Technical Committee where the Northeast Lexicon was finalized.

The Northeast Lexicon is organized around the congressionally required eight elements for State Wildlife Action Plans (page 6). Hierarchical naming systems are adopted for

- 1) species (existing scientific nomenclature),
- 2) landscape-scale habitat types,
- 3) threats to species or habitats, and
- 4) actions typically recommended to address these threats.

By using these consistent naming systems, common threats to priority species in specific habitats, along with actions proposed to address them, can be identified across the region.

In addition to these systematic naming systems, data structures provide consistent and complete description of species, habitats, threats, actions, and monitoring plans.

- 1) For species (Element 1), the Northeast Lexicon documents many of the most important status and trend assessments which demonstrate the conservation need of the species.
- 2) For habitats (Element 2), the Lexicon provides descriptions of extent and condition, both of which are required in State Wildlife Action Plans.

- 3) For threats (Element 3), the Northeast Lexicon responds to the Best Practices Report developed for the 2015 revision period by outlining six characteristics (immediacy, spatial extent, reversibility, certainty, severity, and likelihood) which are important for assessing threat risk.
- 4) Offering improvements to the 2005 plans and addressing the Best Practices Report guidance to develop clearer action items (Element 4), the Northeast Lexicon provides a comprehensive guide for describing actions. Using the minimal descriptions in the Lexicon produces a catalog of proposed actions, while adding the second tier of descriptions can assist in action prioritization. A third tier of descriptions is provided for actions that are ready for implementation.
- 5) A system for developing monitoring plans (Element 5) to assess project success, and basic elements explaining protocols to monitor species status and trend or habitat quality are also included in the Northeast Lexicon.
- 6) Highlights of guidance for plan review and revision (Element 6) and public/stakeholder/partner engagement (Element 7 and 8) are provided for easy reference.

As states work through the 2015 State Wildlife Action Plan revision process, the Northeast Lexicon will be applied and tested. While it is anticipated that some modifications may emerge, State Wildlife Action Plan coordinators are confident that the scope and structure of the Lexicon provides a solid foundation but also believe in its adaptive capacity to continue to evolve with future knowledge and applications. This report recommends that the Northeast Association of Fish and Wildlife Agencies proceed toward the development a regional database of wildlife action plans, incorporating the data format and structure of the Lexicon and developing a pilot database application. This pilot will allow us to test and demonstrate the function of the Lexicon in a database context. The Fish and Wildlife Diversity Technical Committee anticipates this pilot database could be available for states by September 2014, a year before the State Wildlife Action Plan deadline.

The Northeast Association of Fish and Wildlife Agencies Fish and Wildlife Diversity Technical Committee should continue to work toward development of a regional web-accessible database to house individual state's Wildlife Action Plan content. The completed Lexicon forms the foundation of a regional database that will facilitate the sharing of information between states. Such a database will help states share information on priority species, known threats for these species and needed actions to address these threats – the required elements of State Wildlife Action Plans.

A web-accessible regional State Wildlife Action Plan database incorporating the key elements of individual State Wildlife Action Plans would benefit the region by providing a systematic and

objective way to understand priority species, habitats, and threats in the region. It would help states coordinate actions and use similar monitoring protocols by facilitating the sharing of information. Finally, it would help non-governmental conservation partners support actions on behalf of wildlife in the northeast region. Because many of these opportunities for collaboration are dynamic and outside conventional funding streams, facilitating searches for specific conservation needs can help make these priority actions reality.

This collaborative effort in the northeast region has been highlighted in the Best Practices Report for State Wildlife Action Plans. It can serve other regions as a template for the development and the implementation of a Lexicon and regional database. It exemplifies 50 years of collaborative conservation planning in the northeast and visionary leadership of the Northeast Fish and Wildlife Diversity Technical Committee, Northeast Association of Fish and Wildlife Agencies and the Directors of the fourteen northeast Fish and Wildlife agencies.

## SECTION I: INTRODUCTION

In the northeastern U.S., states are numerous and borders often ignore landscape features which delineate habitat types. Here, states have a history of employing collaborative approaches for the protection and management of fish and wildlife. This collaboration has been enhanced through a partnership of the member states of the Northeast Association of Fish & Wildlife Agencies (NEAFWA), in particular its Northeast Fish and Wildlife Diversity Technical Committee, and the U.S. Fish & Wildlife Service's (USFWS) North Atlantic and Appalachian Landscape Conservation Cooperatives (LCCs).

The development of State Wildlife Action Plans in 2005 provided a new opportunity to coordinate conservation actions. While all Wildlife Action Plans had to meet or exceed the eight Congressionally required elements (see inset text box) (Fiscal Year 2001 Commerce, Justice, State, and Related Agencies Appropriations Act 2000) to be accepted by the USFWS, differing approaches taken by states in developing their Action Plans have made it difficult to compile and compare information regionally and nationally (Lerner et al. 2006). Among the Wildlife Action Plans under the jurisdiction of the NEAFWA states, there exists broad commonality in focus and approach as well as substantial differences because states used different organizational structures for their plans, different criteria for defining Species of Greatest Conservation Need (SGCN), different habitat classification systems, and different ways to describe threats and actions. Most are lengthy documents that are difficult to search, making it excessively difficult and time consuming, if not impossible, to compare similar conservation needs across the region or sub-regions.

To address these challenges, in 2012 the Northeast Fish and Wildlife Diversity Technical Committee received matching funds from NEAFWA Directors to develop a framework that would allow states, LCC's, and other partners to compare Wildlife Action Plans across state lines. At the same time, the Association of Fish and Wildlife Agencies prepared guidance entitled *Best Practices for State Wildlife Action Plans* to help states learn from each other and provide resources to improve the effectiveness of these comprehensive plans (Association of Fish and Wildlife Agencies, Teaming With Wildlife Committee, State Wildlife Action Plan (SWAP) Best Practices Working Group 2012) (hereafter "Best Practices Report"). For states that share Species of Greatest Conservation Need and habitat types, these best practices encourage the use of common classification systems. In fact, the Best Practices Report highlighted the proposal for the Northeast Lexicon as Case Study 3c (p. 21), effectively endorsing this as a viable solution to the nationally recognized problem of regional collaboration and integration.

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*Required Elements for State Wildlife Action Plans*

Element 1: "... information on the distribution and abundance of species of wildlife, including low population and declining species as the state fish and wildlife department deems appropriate, that are indicative of the diversity and health of wildlife of the state;"

Element 2. "identifies the extent and condition of wildlife habitats and community types essential to conservation of species identified under *Element 1*;"

Element 3. "identifies the problems which may adversely affect the species identified under *Element 1* or their habitats, and provides for priority research and surveys to identify factors which may assist in restoration and more effective conservation of such species and their habitats;"

Element 4. "determines those actions which should be taken to conserve the species identified under *Element 1* and their habitats and establishes priorities for implementing such conservation actions;"

Element 5. "provides for periodic monitoring of species identified under *Element 1* and their habitats and the effectiveness of the conservation actions determined under *Element 4*, and for adapting conservation actions as appropriate to respond to new information or changing conditions;"

Element 6. "provides for the review the State wildlife conservation strategy and, if appropriate revision at intervals not to exceed ten years;"

Element 7. "provides for coordination to the extent feasible the State fish and wildlife department, during development, implementation, review, and revision of the wildlife conservation strategy, with Federal, State, and local agencies and Indian tribes that manage significant areas of land or water within the state, or administer programs that significantly affect the conservation of species identified under *Element 1* or their habitats."

Element 8. "A State shall provide an opportunity for public participation in the development of the comprehensive plan required under *Element 1*."

*(Fiscal Year 2001 Commerce, Justice, State, and Related Agencies Appropriations Act. Public Law 106-553, codified at U.S. Code 16 (2000) 669(c))*

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The need for consistent systems for conservation planning has long been recognized and important progress has been made. The U.S. Fish and Wildlife Service is implementing a national conservation action reporting system with uniform metadata for all Wildlife and Sport Fish Restoration Program funded projects called Wildlife TRACS (Tracking and Reporting Actions

for the Conservation of Species). Independently, the International Union for Conservation of Nature has adopted a system to classify threats, and actions taken to address these threats.

The northeastern states (Connecticut, Delaware, the District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Virginia, and West Virginia) worked together to develop the Northeast Lexicon – terminology, definitions, and classifications systems for use in State Wildlife Action Plans. Terminology has been developed for each of the eight congressionally required elements in State Wildlife Action Plans. The proposed Wildlife Action Plan terminology can: 1) facilitate the development of multi-state, regional proposals, 2) clarify how each state’s proposals guide, align with, or contribute to regional priorities, 3) translate the regional context for state planning purposes, and 4) make it more likely that other partners will implement recommended actions.

Thus, the Northeast Lexicon is consistent with recommendations of the Best Practices Report, meets regional planning goals, and functions holistically, recognizing inter-dependencies between elements. The Northeast Lexicon is designed to be selectively implemented by states to meet their diverse needs – balancing state flexibility and regional consistency. It is viewed as a menu of choices, all of which could be supported by a regional database to facilitate data sharing between states. The practicality of application of the Lexicon in Wildlife Action Plan revision and the feasibility of using the information included in the Lexicon for the prioritization or ranking of threats and actions was also considered.

Planning processes used to develop Wildlife Action Plans are not incorporated in the Northeast Lexicon. For example, the Best Practices Report emphasizes the importance of prioritization in conservation planning because it is a strategic approach which is important in light of limited resources and capacity. Methods for prioritization are a very active area of research and states are currently exploring approaches. Therefore, terminology and methods for prioritization are not provided within the Northeast Lexicon, although attempts were made to ensure that the lexicon outlines the kind of information needed for prioritization.

## METHODS

Several key meetings of the Northeast Fish and Wildlife Diversity Technical Committee facilitated discussion regarding the scope, purpose, and format of the Northeast Lexicon. The process of developing the Northeast Lexicon began with an exhaustive review of existing approaches for conservation planning and associated terminology and definitions from states in the northeast region. Other State Wildlife Action Plans were reviewed, along with the USFWS Wildlife TRACS and the International Union for Conservation of Nature’s systems for describing threats and actions (developed by Foundations of Success). This comprehensive literature search was conducted to identify other common, consistent terminology which could inform



this lexicon development. This literature review included assessments of Elements 1-5, including species and habitat status, prioritization, vulnerability, threat assessment, and action definition and prioritization and were summarized in a comprehensive report (Appendix A). Another important tool, an initial survey of the NE jurisdictions was developed to gauge regional receptivity to a more consistent terminology. This survey also intended to identify what states were planning to use in their 2015 revision. Fifteen survey responses, representing ten states provided a basis to understand areas of potential agreement and disagreement. This was followed by a series of four meetings and face-to-face deliberations to identify a balance between state flexibility and regional consistency that the group was comfortable implementing in their Wildlife Action Plan revisions. Finally, a draft of the agreed upon Lexicon was reviewed by states and adopted on September 24, 2013.

## SURVEY RESULTS

The state survey (Appendix B) revealed areas of strong agreement, disagreement, and, in some cases, concepts that were poorly understood or had uncertain outcomes in State Wildlife Action Plans. These results are summarized here.

Question 3: There was strong agreement on the use of State (100%) and Federal (93%) Listing status and State Heritage rank (85%) as criteria for including species on lists of Species of Greatest Conservation Need.

Question 4: The majority (83%) of respondents agreed that attempts should be made to qualitatively assess population trends for all SGCN while recognizing that abundance data are lacking for many species.

Question 5: While the most appropriate spatial unit for conservation may be habitat type, 85% of respondents identified State, County, or Town Boundary as the most practical unit for use in Wildlife Action Plans, although 77% of respondents also identified Watersheds and 70% identified Habitat Patches.

Question 6: 77% or more identified the following characteristics as important in describing data sources for species distributions: the data source, scale, resolution, age, quality, type, and sensitivity.

Question 7: Regarding the types of data that could be used to document species distributions, 92% agreed element occurrence was appropriate, and 62-80% agreed that source feature, presence/absence points, habitat classes, and habitat patches were also acceptable. 31% or less supported the use of habitat suitability models, niche models, habitat compatibility models, and buffers.

Questions 8 and 9: Previous work to develop the Northeast Terrestrial and Aquatic Habitat Classification Systems was accepted by 69% of respondents with none dissenting (Q8), however the further work to develop GIS systems and spatial habitat condition classifications is not broadly understood (Q9).

Question 10: Using Northeast Partners in Amphibian and Reptile Conservation and the Northeast Fish and Wildlife Diversity Technical Committee as examples of approaches for selecting Species of Greatest Conservation Need based on conservation need and responsibility, 69% of respondents were willing to work toward a common practice for selecting species of greatest conservation need.

Questions 11, 12, 13, and 14: More than 92% of responses agreed that immediacy, certainty, extent, and reversibility are characteristics of threats that should be considered when determining “conservation need” in combination (Q11) and 85% agreed this makes sense when considering single threats affecting single species (Q13). Each of these threat characteristics can be considered in terms of the immediacy and certainty of the impact. There was no agreement on whether or not a useful approach using just 2 or 3 simple categories could be developed (Q12). Scale and extent were supported by 85% of the respondents, while immediacy and reversibility were considered key elements in describing threats by more than 92% of respondents (Q14).

Questions 15 and 16: Most responses (85%) indicated support for movement toward actions with measureable goals, and the ability to measure plan effectiveness as a whole (Q15). The terms Goal; Objective, Desired Outcome, and Indicator were seen as useful words in linking resources with actions and outcomes (>92%) but other aspects of the linkage were poorly understood by respondents (Q 16).

Question 17: Regarding adaptive management, there was agreement that the following terms are useful: Performance Indicator (85%), Start (69%), Duration (77%), and Evaluation Cycle (87%). Fewer responses (55%) supported data management capacity.

Question 18: The link between actions and threats is not always easy to explain. Roughly 83% of responses indicated “threat addressed by action”, “human factors addressed by action”, “environmental factors addressed by action”, “biological stresses addressed by action”, and “expected direct benefits” were all useful in describing the nature of the action-threat link.

Questions 19 and 20: Improving planning processes by employing systematic descriptions of actions, such as S.M.A.R.T. goals-setting, received strong support with 85% agreeing that the lexicon should propose terminology in support of this kind of planning process. The same level of agreement was reached on the idea of assessing the feasibility and efficacy of conservation actions.

Questions 21 and 22: Many respondents (77%) were willing to work toward a regional scheme to prioritize conservation (Q21) and effectiveness and cost were considered important factors. Funding availability, implementer availability, and start date were listed as potential considerations but opinions on their use in action prioritization were mixed (Q22).

Question 23: In Wildlife Action Plans, actions should be spatially explicit. More than 92% responses indicated that geo-political boundaries (like counties or towns) would be very important in defining action locations, but 62% indicated that watersheds and management planning boundaries would also be useful. Habitat classes and patches were supported as a geospatial descriptor by only 50% of respondents.

Questions 24, 25, and 28: The importance of identifying data gaps and uncertainties was well recognized (92%) (Q24) and 75% or more agreed that “uncertainty of causality”, “uncertainty of effectiveness”, “uncertainty of status” and “information gap” were all relevant in descriptions of uncertainty in State Wildlife Action Plans (Q25). 75% thought it would be useful to categorize the “level” of uncertainty, but fewer understood how they would categorize the “risk of consequence” or the “feasibility of reducing [uncertainty or risk]”.

Question 26: Of the 82% of respondents that agreed that numerous categories might be used to organize research and monitoring actions proposed in Wildlife Action Plans, 70% or more supported the following categories: threat detection, change in threat status, presence/absence surveys for SGCN distribution, relative abundance/density, reproduction/demography, detect habitat change, survey habitat quality, genetics, detect contaminants/pollution/air and water quality.

Question 27: At the time of the survey, the majority of respondents could not assess the usefulness of the Wildlife TRACS system in the Northeast Lexicon (75%).

Questions 29 and 30: Common keyword, metadata, and bibliographic standards were acceptable to 92% of respondents.

## SECTION II: THE NORTHEAST LEXICON – USER GUIDE

The Lexicon is organized according to the required Elements. Each Element is organized by the anticipated sequence of the workflow or by degree of complexity. In either case, it is anticipated that the first components of an element are most likely to be implemented by all states (for example, see Element 4, below).

While the 8 elements are identified as unique requirements, there is considerable interaction between them. The identification of Species of Greatest Conservation Need (Element 1) considers direct threats to the population (Element 3) or threats to the habitats (Element 2) on which the species depends. Actions (Element 4) and Monitoring activities (Element 5) are responses to these identified threats to species and/or habitats. Because of these inter-dependencies and the availability of data required to assess each Element, there are many practical approaches to applying the Lexicon within a State Wildlife Action Plan.

In Elements 3 and 4 (Threats and Actions) some states may find the need for additional classifications to name the relevant threats and proposed actions. In the interest of regional consistency, states should share these new classifications so other states can also use them.

The detailed outline on the next page provides a quick reference for Elements and their components.

States are encouraged to use the bibliographic standard of the Journal of Wildlife Management (used in this report) (<http://joomla.wildlife.org/documents/JWMguidelines2011.pdf>). Although use of grey literature is not encouraged by the Journal of Wildlife Management, the citation style can be followed for most reports. However, to help readers find these unpublished sources, website links (URL) to reports should be provided at the end of the reference. Free bibliographic managers are available including Zotero (<http://www.zotero.org/>), Mendeley (<http://www.mendeley.com/>) and the Council of Science Editors' Citation Wizard ([http://21cif.com/tools/citation/cse/citeWizard\\_cse\\_1.0.html](http://21cif.com/tools/citation/cse/citeWizard_cse_1.0.html)).

To improve the consistency of citing Wildlife Action Plans, an example citation should be provided in the front matter. For example:

Pennsylvania Game Commission and Pennsylvania Fish and Boat Commission. 2015.  
Pennsylvania Wildlife Action Plan. Harrisburg, PA. (link to report)

If prepared by a consultant:

Rhode Island Department of Environmental Management. 2015. Rhode Island Wildlife Action Plan. Prepared by Terwilliger Consulting, Inc. and the RI Chapter of the Nature Conservancy. Providence, RI. (link to report)

## Element 1 (Species) Northeast Lexicon provides

- a menu of established conservation assessments used by states when selecting their Species of Greatest Conservation Need (page 17)
  - Federal Legal Listing (<http://www.fws.gov/endangered/>)
  - Regional SGCN
  - State Legal Listing
  - State Natural Heritage Program and NatureServe Rankings
  - Regional or Species Group Conservation Prioritization
  - IUCN Red List (<http://www.iucnredlist.org/>)
- a list of foundational criteria used to explain the addition or exclusion of species from the Species of Greatest Conservation Need list (page 17)
  - Species Abundance and Trend
  - Threat
  - State Responsibility
  - Habitat Trend
  - Information Deficient
- a set of species characteristics (e.g. scientific name, habitat type) needed for regional database integration (pages 18-19)
  - Scientific Name
  - Common Name
  - Detailed Scientific Name
  - Associated Habitat Type
  - Associated Habitat Features
  - Habitat Preferences
  - Federal Listing
  - State Listing
  - G-rank (<http://www.natureserve.org/explorer/servlet/NatureServe?init=Species>)
  - S-rank
  - Distribution within the state
  - Extirpation status
  - Threats impacting the species
  - Population Trend
  - Data Confidence
  - Data Age
  - Data Completion

## **Element 2 (Habitats) Northeast Lexicon provides**

- a recommendation to use the Northeastern Terrestrial Wildlife Habitat Classification System and the Northeast Aquatic Habitat Classification System to classify and name habitat types (pages 22-24)
- terminology to consistently describe habitat characteristics (page 25)
  - Habitat extent
  - Habitat condition
  - Threats to Habitat

## **Element 3 (Threats) Northeast Lexicon provides**

- a recommendation to use the IUCN hierarchical threat classification system (Salafsky et al. 2008) and a table that displays the system along with a crosswalk to Wildlife TRACS threats (page 27)
- a set of threat characteristics to assess risk or impact (page 28)
  - Severity
  - Reversibility
  - Immediacy
  - Spatial extent
  - Certainty
  - Likelihood

## **Element 4 (Actions) Northeast Lexicon provides**

- a recommendation to use the Wildlife TRACS hierarchical action classification system and a table displaying the system along with a crosswalk to IUCN actions (page 31)
- a set of action characteristics to provide a complete description of the proposed action, including monitoring and adaptive management plans (page 32-34)
  - Name (For all actions)
  - Objective (For all actions)
  - General Strategy (For all actions)
  - Purpose (For all actions and for prioritization of actions)
  - Benefits (For prioritization of actions)
  - Estimated Costs (For prioritization of actions)
  - Urgency (For prioritization of actions)
  - Likelihood of success (For prioritization of actions)
  - Implementing Organizations (For implementation of actions)
  - Affected Parties (For implementation of actions)
  - Action Location (For implementation of actions)

- Detailed Strategy (For implementation of actions)

#### **Element 5 (Monitoring) Northeast Lexicon provides**

- a recommendation to use the Association of Fish and Wildlife Agencies recommendations from “Measuring the Effectiveness of State Wildlife Grants” to assess action results (page 39) ([http://www.fishwildlife.org/files/Effectiveness-Measures-Report\\_2011.pdf](http://www.fishwildlife.org/files/Effectiveness-Measures-Report_2011.pdf))
- a recommendation to use standard protocols or well-described protocols for species monitoring (page 39)
- a recommendation to use standard protocols or well-described protocols for habitat quality monitoring (page 40)

#### **Element 6 (Plan Review) Northeast Lexicon provides**

- a summary table of guidance provided by the national Best Practices Report explaining the differing requirements for Comprehensive Review, Major Revision, and Minor Revision related to the following (page 42)
  - Date of review
  - Summary of changes
  - Explanation of no change
  - Web access to the plan
  - Public review
  - Documentation of public review
  - Taxa experts

#### **Elements 7 and 8 (Public Engagement) Northeast Lexicon provides**

- Definitions for *public*, *stakeholders*, and *partners* (page 44)
- An explanation of the differences in communication strategies for each group (page 44)

## SECTION III: THE NORTHEAST LEXICON

### CHAPTER 1: ELEMENT 1, SPECIES OF GREATEST CONSERVATION NEED

Identifying “Species of Greatest Conservation Need” (SGCN) implies the use of a method to select species based on fundamental considerations such as population status and trend or known threats. After identifying potential screening criteria based on the experiences of the NEAFWA states, drawing on Wildlife Action Plans around the U.S., and reviewing approaches used by other conservation organizations, the Northeast Lexicon represents common sources and considerations for selection of SGCN. These criteria are practical and functional and aim to encompass the range of criteria used by northeastern states when determining Species of Greatest Conservation Need.

The choice of criteria and methods for their application will be made by each state. In the interest of transparency and consistency with the Best Practices Report, Wildlife Action Plans should specify the criteria selected and the methods used so that differences between state lists can be understood and explained. If thresholds specific to an established assessment source are selected (e.g., the range of S-ranks and use of uncertain S-ranks for selecting a subset of species from Natural Heritage Program data, or the categories of vulnerability assigned to species on the IUCN Red List) these choices should also be noted in the explanation of methods.

Most states will use established species assessments (Table 1) as a starting point for selecting SGCN because these established species lists provide a ranking of species concern based on some of the fundamental considerations used to select SGCN (Table 2). Species found on the established assessment lists (Table 1) could all be considered for inclusion as state SGCN, but after reviewing the fundamental considerations (Table 2) some species may not be listed as state SGCN. Conversely, some species not found on the established assessment lists (Table 1) may be listed as state SGCN after reviewing the fundamental considerations (Table 2). If states choose not to list Regional SGCN as state SGCN, even though they occur in the state, the Wildlife Action Plan should include a description of the species’ current status in the state and any conservation or monitoring activities occurring in the state. Also, some states have elected to include indicator, keystone or representative species as SGCN even if the species is not vulnerable.

Once species are identified as SGCN, information to identify and describe the species, their habitats, their threats, and the quality of available data should be included in Wildlife Action Plans (Table 3). Choices related to taxonomic conventions should be documented.



**Table 1.** The Northeast Lexicon recommends considering the species in these established assessments for inclusion as state SGCN:

Federal Legal Listing	species that are federally-listed as threatened or endangered <i>if</i> the species occurs within the state; some states may also consider candidate or petitioned species after positive 90-day finding
Regional SGCN	species that are listed as NEAFWA Regional SGCN (2013) <i>if</i> the species occurs within the state
State Legal Listing	species that are state-listed with a legal designation that indicates need for conservation (e.g., threatened, endangered)
State Natural Heritage Program and NatureServe Rankings	species with global ranks (G1-G3 ) and state ranks (S1-S3); some states may also consider historical, extirpated or possibly extirpated species (GX, GH, SX, SH) or species with uncertain ranks
Regional or Species Group Conservation Prioritization	conservation prioritizations are available for some species groups through prominent organizations and planning systems (e.g. Partners in Flight, National Marine Fisheries Service, and Partnership for Amphibian and Reptile Conservation)
IUCN Red List	species that are Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or Near Threatened (NT)

**Table 2.** The Northeast Lexicon recognizes these fundamental considerations for assessing species conservation need:

Species Abundance and Trend	Population status and trends for a species, including extirpation status
Threat	The number, immediacy, extent, and/or reversibility of known threats to species populations
State Responsibility	The relative importance of the state to conservation of the species, compared to other states or countries in the species' range.
Habitat Trend	Changes in the extent or condition of habitat which may be closely related to threats (e.g. climate change, land use change associated with development, or insect pests which can change the composition of a forest)
Information Deficient	Species that lack sufficient documentation to appear in sources listed in Table 1, or to be justified based on abundance, trend, threat, or habitat concerns may be considered SGCN with an interest in research to better understand conservation needs

**Table 3:** Information about each species that could be included in State Wildlife Action Plans and the regional database.

<b>Data Name</b>	<b>Data Description</b>	<b>Data Format and example</b>
Scientific Name	Naming conventions should follow taxonomic standards recommended by the Best Practices Report (p. 10).	Genus and species i.e. <i>Glaucomys sabrinus</i>
Common Name	Naming should follow standards when available (e.g., American Ornithologists' Union checklist for birds).	i.e. Northern Flying Squirrel
Detailed Scientific Name	If used as a conservation target, subspecies or population segment may be provided.	i.e. <i>Glaucomys sabrinus macrotis</i>
Associated Habitat Type	Species should be linked to habitat types using the Northeast Terrestrial Wildlife Habitat Classification System or the Northeast Aquatic Habitat Classification System (see Element 2). Multiple habitats may be selected considering core, supporting, breeding, migratory, wintering or other special habitat use.	NETWHCS or NEAHCS (dropdown menus)  (see Element 2)
Associated Habitat Features	If the species is associated with particular sites within the habitat classification systems, these site conditions should be identified. (e.g. Boulder fields, springs, seeps, vernal pools, rocky outcrops, caves, manmade structures, cliffs, talus slopes, flat rocks in stream beds)	i.e. Old-growth
Habitat Preferences	This is a narrative field to explain, in more detail, the habitat requirements or preferences of the species.	i.e. Northern flying squirrels prefer old-growth boreal forests that contain a heavy coniferous component, moist soils, and lots of downed woody debris.
Federal Listing	This documents the federal listing of species.	Endangered, Threatened, Candidate, Petitioned with 30-day finding, no status  i.e. no status
State Listing	This documents the state listing of species.	State listing classes  i.e. Endangered

G-rank	Global ranks can be downloaded from NatureServe for all species in a state.	G1, G2, G3, G4, G5, G1G2, G2G3, G3G4, G1G3, G2G4, G3G5, GU, GX, GH, GNR, GNA
S-rank	The most up-to-date state ranks should be sourced from State Natural Heritage Programs or other in-state source.	S1, S2, S3, S4, S5, S1S2, S2S3, S3S4, S4S5, S1S3, S2S4, S3S5, SU, SX, SH, SNR, SNA
Distribution within the state	Species distributions may be defined in terms of mapped units such as watersheds, habitat classification systems, geopolitical boundaries, models or other useful spatial units.	i.e. Sites are located in the following counties: Wayne, Pike, Monroe, Carbon, Luzerne, Warren and Potter
Threats impacting the species	Threats should be listed and anticipated interactions between these threats should also be noted.	IUCN Threats, as amended  i.e. 5.3.4 Biological Resource Use/ Logging and Wood Harvesting / unintentional effects large scale
Population Trend	Quantitative assessments or qualitative assessments such as increasing, decreasing, stable, or unknown (used by the IUCN RedList) may be suitable.	
Data Confidence	Quality of available data, considering completeness, age, and other factors, should be assessed.  Excellent – very useful for management decisions, recent, complete, accurate.  Poor – data are unreliable for management decisions because it is historical, sparse, and/or has questionable accuracy and cannot be verified.	Excellent, Good, Fair, Poor, Data Deficient
Data Age	This field could recognize data as historical vs current, or it could provide a date range	
Data Completion	This field assesses the consistency of data over time or space.	

## BACKGROUND AND RATIONALE

State Wildlife Action Plans are required to identify “species in greatest need of conservation”. These species should include low, declining, and otherwise vulnerable populations that are indicative of the diversity and health of the state’s wildlife. For each of these species, the distribution and abundance should be reported.

This Northeast Lexicon will help northeastern states communicate which factors were used and how they were used to select the state’s Species of Greatest Conservation Need. Differences between state lists will be more easily understood, and a regional database will more readily document methodological differences between states if criteria have standard descriptions. This transparency was highly recommended in the national Best Practices Report for Wildlife Action Plans.

The species screening criteria selected for the Northeast Lexicon are very commonly applied in Wildlife Action Plans nationwide (see Appendix A). Specifically:

- **Threatened and Endangered species status** (federal and state) implies that sufficient documentation of species vulnerability has already been provided and warrants inclusion on the state’s SGCN list, provided the species relies on habitat within the state. Likewise, species included on the **Regional SGCN** list have already been screened and vetted within the northeast region. Survey results showed nearly unanimous agreement with using federal and state listing as a criteria for state SGCN.
- **State Natural Heritage Programs** provide state-specific data, including abundance and trend, to assess species population stability. The Best Practices Report recommends the NatureServe conservation status assessment methodology (described below), used by State Heritage Programs, as a standardized method for assessing extinction/extirpation risk. Additional assessments of abundance and trend information (required in Element 1) and species-specific assessment tools may also be included in the screening criteria for SGCN through established **independent assessment programs**, such as Partners in Flight.
- **Global rankings** can highlight species vulnerability and/or importance from the broadest possible perspective.
- While **abundance and trend** data may be lacking for some species, this information is typically the foundation for identifying vulnerable species and is required by Element 1.
- **Threat severity** is a factor in predicting vulnerability especially when species do not yet exhibit impacts (e.g. climate change effects) and the Best Practices Report recommends that immediacy and magnitude of threats be considered in the process of assessing species’ conservation needs.

- The Best Practices Report encourages the consideration of the **importance of state habitat** in determining SGCN (pg. 6) and this consideration has been calculated (albeit in different ways) in the northeast region for some time.
- **Trends in habitat extent or condition** can be important indicators of population trends. This information also helps determine which conservation objectives and strategies will benefit multiple species.
- Species that lack information to determine the appropriate level of conservation concern may be included as SGCN so that population surveys and research to understand habitat requirements can lead to a more informed decision about conservation needs. However, research projects for species that are not SGCN may be proposed to determine the degree of conservation concern.

NatureServe's Conservation Status Assessment (Master et al. 2012) is highly recommended in the Best Practices Report. The fundamental considerations provided in the Northeast Lexicon encompass the scope of factors used in the NatureServe Conservation Status Assessment (Table 4).

**Table 4.** Factors used in the NatureServe Conservation Status Assessment.

Factor Category	Factor	Condition (Rule)
<b>Rarity</b>	Range Extent	Always use, if available
	Area of Occupancy	Always use, if available
	Population	Always use, if available (species only)
	Number of Occurrences	Always use, if available
	Number of Occurrences or Percent Area with Good Viability/Ecological Integrity	Always use, if available
	Environmental Specificity	Only use if both the Number of Occurrences and Area of Occupancy are Unknown or Null
<b>Trends</b>	Long-term Trend	Always use, if available
	Short-term Trend	Always use, if available
<b>Threats</b>	Threats	Always use, if available
	Intrinsic Vulnerability	Only use if Threats is Unknown or Null

## CHAPTER 2: ELEMENT 2, HABITATS

The word “habitat” can be interpreted in many ways, even within the Wildlife Action Plan. Commonly, “habitat” either describes the specific needs of a particular species/guild or is a classification of vegetation or other structure underlying habitat type. While it is clearly linked to the Species of Greatest Conservation Need in plan requirements, Wildlife Action Plans are comprehensive planning documents that guide conservation actions statewide, and thus benefit from taking a landscape-scale perspective that can produce multi-species plans. Furthermore, for the vast majority of species, insufficient data on habitat use and requirements prevents detailed species-specific habitat descriptions. To resolve these disparate interpretations of “habitat”, the Northeast Lexicon Element 2 primarily views habitat classification from the landscape scale while providing for species-specific habitat description in Element 1.

**Habitat Type.** The Northeastern Terrestrial Wildlife Habitat Classification System (hereafter Terrestrial Habitat Classification) (Figure 1) was developed in 2008 to provide a coarse but cohesive system to describe the physical and biological characteristics relevant to wildlife conservation (Gawler 2008). The habitat classification consists of two levels – a habitat system (Table 5) and a structural modifier (Table 6). The habitat system corresponds to the ecological system units developed by NatureServe which occur in the Northeast, with additional systems for altered habitats and land-use types. The hierarchical system includes 7 Formation Classes at the top level, 15 Formations in the second tier, 35 Macrogroups in the third tier and 143 habitat types comprise the bottom level (fourth tier) of a hierarchical system (Table 5). Structural modifiers can be added to describe cover (herbaceous, shrub, open water), age classes, disturbance history, or geologic features like karst (Table 6).

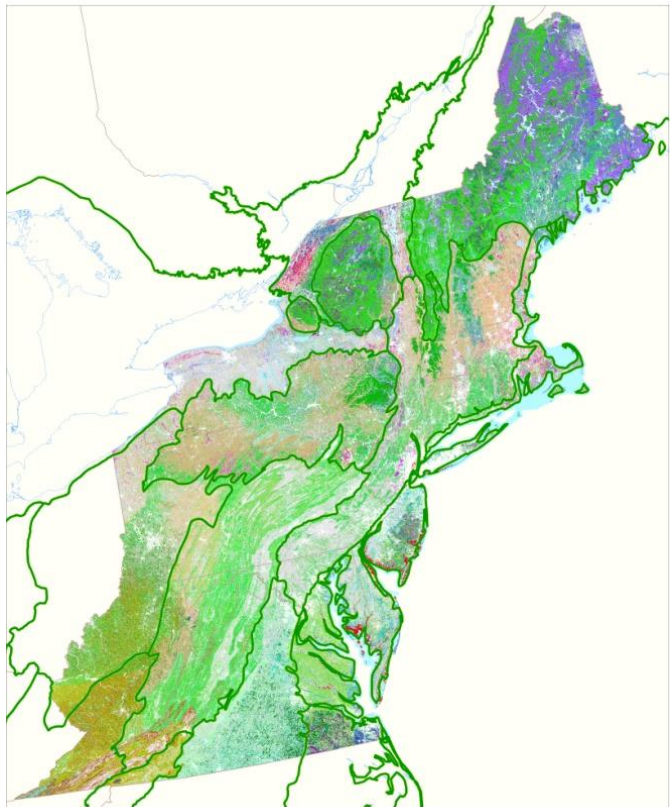


Figure 1. Northeast Terrestrial Wildlife Habitat Classification System.

**Table 5.** Formations and Macrogroups comprising the Northeast Terrestrial Wildlife Habitat Classification System.

Formation Class	Formation Name	Macrogroup
Forest and Woodland	Southeastern Upland Forest	Longleaf Pine
	Northeastern Upland Forest	Southern Oak-Pine Central Oak-Pine Northern Hardwood & Conifer Plantation and Ruderal Forest Exotic Upland Forest
	Northeastern Wetland Forest	Southern Bottomland Forest Coastal Plain Swamp Central Hardwood Swamp Northeastern Floodplain Forest Northern Swamp
	Boreal Upland Forest	Boreal Upland Forest
	Boreal Wetland Forest	Boreal Forested Peatland
Shrubland and Grassland	Grassland and Shrubland	Glade and Savanna Outcrop & Summit Scrub Lake & River Shore Ruderal Shrubland & Grassland
	Coastal Scrub-Herb	Coastal Grassland & Shrubland
	Peatland	Northern Peatland Coastal Plain Peatland Central Appalachian Peatland
	Freshwater Marsh	Coastal Plain Pond Emergent Marsh Wet Meadow / Shrub Marsh Modified / Managed Marsh
	Salt Marsh	Salt Marsh
Polar and High Montane	Alpine	Alpine
Aquatic (in part)	Intertidal	Intertidal Shore
Sparsely Vegetated Rock	Cliff & Rock	Cliff and Talus Flatrock Rocky Coast
Agricultural	Agricultural	Agricultural
Developed	<i>No name provided</i>	Maintained Grasses and Mixed Cover
		Urban/Suburban Built
		Extractive

**Table 6.** Structural modifiers to provide additional detail about the habitat condition. Quantitative classes are provided for each modifier type (see NETWHCS documentation).

Gross Cover Type	Modifier Type
Forest (>10% tree cover of >5m)	Canopy cover Evergreen:deciduous ratio (% evergreen) Number of canopy layers Recently burned (detectable) Stand development Understory shrub/herb layer
Shrubland and mixed shrub/herb (not forest, and >10% shrub cover)	% shrub cover Shrub height Evergreen:deciduous (as % evergreen)
Herbaceous (nor forest or shrubland, and >10% herb cover)	Cover Grass/forb height Native/introduced Scattered tall shrubs/small trees
Special modifiers for wetlands	Saltmarsh elevation Open water
Special modifiers - other	Karst

Any appropriate level of the Terrestrial Habitat Classification may be used. For example, some states may use formations or macrogroups to understand how conservation actions are distributed across habitats or for other purposes. On the other hand, for the purposes of identifying habitat(s) used by individual species (as in Element 1), the fourth tier (most detailed) classification level should be named and in instances for which more specific habitat requirements are known, the structural modifier may be used.

The Northeast Aquatic Habitat Classification System (hereafter Aquatic Habitat Classification) is a standardized classification system and GIS dataset to describe and map stream systems across the Northeast (Olivero and Anderson 2008). The system and data consistently represents the natural flowing-water aquatic habitat types across this region in a manner that is useful for conservation planning. The system was designed to unify state classifications and promote an understanding of aquatic biodiversity patterns across the entire region. It is not intended to override local stream classifications but rather to put them into a broader context. This approach can be implemented across regional scales using GIS modeled variables that shape aquatic habitats such as stream size, slope, elevation, climate, and geology and lake size, elevation, shoreline sinuosity, and connectivity. This dataset can be used similarly to the Terrestrial Habitat Classification. The Aquatic Habitat Classification is being revised to better represent lakes and ponds, so Wildlife Action Plans should refer to updated documentation.



**Habitat Extent.** Both the terrestrial and aquatic systems are available with GIS coverage for the entire region. A map of the habitat type being described could be included in Wildlife Action Plans along with the acreage and the percent of the state classified in the habitat type. For the purposes of describing state habitat, extents of habitat types occurring within the state should be provided. For individual species, habitat extent (habitat used) may be less than the full extent of the habitat type. When this information is available, states may choose to describe habitat extent for a species' population, rather than the entire habitat type, but it should be made clear which extent is quantified.

**Habitat Condition.** Condition may be described as a result of the Geospatial Condition Analysis of Northeast Habitats currently being prepared as RCN Project 2009-02. The project evaluates the current condition of terrestrial and aquatic habitats across the northeast focusing on indicators of human modification securement, land impacts (such as hydraulic fracturing), and connectivity since these directly reflect the quality or degradation of habitat. Other potentially useful sources of condition assessment include the UMASS Index of ecological integrity and the NALCC "condition ranks". States may wish to downscale the regional dataset using more specific data available for their state.

**Threats to Habitat.** All threats that have impacts on the habitat type can be selected from the classification system provided for Element 3.

## **BACKGROUND AND RATIONALE**

State Wildlife Action Plans must describe the extent and condition of habitats and community types that are essential to the conservation of "Species of Greatest Conservation Need". The Best Practices Report recommends a regional approach and specifically mentions the Northeast Habitat Classification System (Terrestrial Wildlife and Aquatic) as examples.

While the northeastern states used different vegetation classification systems in their initial Wildlife Action Plans, the Northeastern Terrestrial Wildlife Habitat Classification System (which is based on ecological systems developed by NatureServe) and Northeastern Aquatic Habitat Classification System were developed under funding from the northeast states, as they determined this was an essential tool for use in multi-state species recovery efforts. Crosswalks between habitat systems used by northeastern states in previous Wildlife Action Plans are provided in Appendix D of The Northeast Terrestrial Wildlife Habitat Classification System Report (Gawler 2008).

Additional work by Mark Anderson (The Nature Conservancy) provides the most applicable and feasible method to describe and quantify habitat condition, consistent with the choice to use the habitat classification systems developed for the region. However, states will rely on higher resolution or ground-truthed habitat condition information when it is available.

In addition, this lexicon suggests that threats specific to habitat types also be identified to facilitate project prioritization, funding, and reporting.

## CHAPTER 3: ELEMENT 3, THREATS

Threats come from many different sources, and impacts can be observed at different spatial, temporal, and biological scales. As a result, the risk of the impacts is wide-ranging, as are actions taken in response. The Northeast Lexicon provides a hierarchical system for classifying and naming threats, based on the IUCN classification system (Salafsky et al. 2008) and threat characteristics that are important in determining threat risk and appropriate responses.

**Threat Classification System:** The Northeast Lexicon adopts the IUCN threat classification system to classify and name threats. This system is hierarchical, with three tiers and is used in the NatureServe rank calculator (see Element 1). The top tier indicates the broadest categorization of threats and includes:

- Residential and Commercial Development
- Agriculture and Aquaculture
- Energy Production and Mining
- Transportation and Service Corridors
- Biological Resource Use
- Human Intrusions and Disturbance
- Natural System Modifications
- Invasive and Other Problematic Species and Genes
- Pollution
- Geological Events
- Climate Change and Severe Weather.

Within this structure, regionally agreed upon or state-specific threats may be added when necessary.

**Threat risk.** To rank threats by risk (level of impact considering severity and likelihood), the Northeast Lexicon provides definitions for the severity, reversibility, immediacy, spatial extent, certainty, and likelihood of threats (Table 7). These definitions may apply to single threats, or the compounding impact of interacting threats.

**Table 7.** Threat characteristics and categorical ratings.

<b>Threat Characteristic</b>	<b><i>Low Impact</i></b>	<b><i>Moderate Impact</i></b>	<b><i>High Impact</i></b>
<b>Severity</b>	<b>Slight Severity:</b> Degree of ecological change is minor	<b>Moderate Severity:</b> Degree of ecological change is substantial	<b>Severe:</b> Degree of ecological change is major
<b>Reversibility</b> (Consider the likelihood of reversing the impacts within 10 years)	<b>Reversible:</b> Effects of the threat can be reversed by proven actions	<b>Reversible with difficulty:</b> Effects of the threat may be reversed but costs or logistics make action impractical	<b>Irreversible:</b> Effects of the threat are irreversible
<b>Immediacy</b> (This characteristic assesses the time scale over which impacts of the threat will be observable.)	<b>Long-term:</b> Effects of the threat are expected in 10-100 years given known ecosystem interactions or compounding threats	<b>Near-term:</b> Effects of the threat are expected within the next 1 - 10 years	<b>Immediate:</b> Effects of the threat are immediately observable (current or existing)
<b>Spatial Extent</b> (Consider impact of threat within 10 years)	<b>Localized:</b> (<10%) A small portion of the habitat or population is negatively impacted by the threat.	<b>Dispersed or Patchy:</b> (10-50%)	<b>Pervasive:</b> (>50%) A large portion of the habitat or population is negatively impacted by the threat.
<b>Certainty</b>	<b>Low Certainty:</b> threat is poorly understood, data are insufficient, or the response to threat is poorly understood	<b>Moderate Certainty:</b> some information describing the threat and ecological responses to it is available, but many questions remain	<b>High Certainty:</b> Sufficient information about the threat and ecological responses to it is available
<b>Likelihood</b> (Consider impact of the threat within 10 years) (This characteristic is used to assess the certainty surrounding the threat and its impacts.)	<b>Unlikely:</b> Effects of the threat are unlikely to occur (less than 30% chance)	<b>Likely:</b> Effects of threat are likely to occur (30-99% chance)	<b>Occurring:</b> Effects of the threat are already observable (100% chance)

## **BACKGROUND AND RATIONALE**

State Wildlife Action Plans must include descriptions of problems adversely affecting Species of Greatest Conservation Need or their habitats. The Best Practices Report for State Wildlife Action Plans recommends the use of the IUCN threat classification system (Salafsky et al. 2008). Threats are viewed as important factors in prioritization of actions and ranking of conservation need.

After considering the applicability of the Wildlife TRACS and IUCN threat classification systems and the scope of threats addressed by conservation actions proposed in Wildlife Action Plans for northeastern states, the IUCN classification system appears most useful at this time, due in part to the more limited number of threats addressed in Wildlife TRACS. The IUCN system is also the recommended choice in the Best Practices Report. However, because actions will often be reported through the Wildlife TRACS system, a translation from IUCN to Wildlife TRACS is provided to facilitate data management.

In addition to naming threats, understanding threat characteristics can help highlight opportunities for species and habitat management or protection. Proposals to fund conservation actions typically explain the threat being addressed in the project justification, and reporting systems, such as Wildlife TRACS, integrate threat identification. To best meet these planning, funding, and reporting needs, utilizing this lexicon will help ensure that all needed information is available in the Wildlife Action Plan. It may also minimize workload as each proposed action is considered for funding or final results are reported and presented. In addition, it may be possible to prioritize threats (and/or associated actions) for regional coordination if multiple states have identified them as pervasive, severe, and/or immediate.

The extensive review of existing conservation planning approaches (see Appendix A) along with needs presented by northeastern states led to the threat characteristics described above. The first four characteristics were widely used by the organizations surveyed. Many of the reviewed approaches used four levels of impact. The three-level approach described here provides a more rapid assessment yet still distinguishes threats. Some approaches characterize past, present, and future threats. Current and future threats are represented here by the “immediacy” characteristic, but past threats are not included.

**Immediacy** – Other approaches have used the terms urgency or timing. The choice presented above is very similar to Master et al. (2012) and Salafsky et al. (2003).

**Spatial extent** – Several alternatives were found in the literature, especially “scope”. The Northeast Lexicon uses the term “spatial extent” because it is more specific, and many of the other words used by conservation organizations are employed in the impact descriptions for spatial extent, such as “localized”, “patchy”, “pervasive”, and the reference to a “portion” of

habitat. The possibility of interpreting “spatial extent” in the context of populations distributed across the state was added. NALCC and the Geospatial Habitat Condition Analysis provide additional information from models and predictions of spatial extent (NALCC 2013 and Anderson 2013- both ongoing)

Reversibility – The impact levels for this characteristic are adapted from Salafsky et al. (2003).

Certainty – Uncertainty is a long-standing and challenging issue for natural resource managers. In the IUCN guidance for assessors (related to assigning CR/EN/VU ratings), uncertainty is seen as being derived from three sources: natural variability, vagueness in the terms and definitions used in the criteria, and measurement error (Akçakaya et al. 2000, IUCN Standards and Petitions Subcommittee 2013). Lack of data is not considered a part of uncertainty in the IUCN approach. In the discussion of how to deal with uncertainty, IUCN recognizes that risk tolerance and dispute tolerance are factors in decision-making with uncertain information. IUCN recommends a “precautionary but realistic attitude”. For the purposes of the Lexicon, lack of data has been included as a source of uncertainty.

Severity – Other approaches have variously used the terms “severity”, “intensity”, and “impact”. The lexicon reserves the word “severity” for the overall assessment based on all of the threat characteristics and uses “intensity” to represent the degree of impact associated with the threat. “Impact” was used for all characteristics to represent the scale of influence the threat would have on resources.

Likelihood – Sometimes referred to as probability as in (Salafsky et al. 2003).

Other options were considered but not included in the lexicon. “Duration” has not been included because few threats will have short durations making this characteristic less useful for distinguishing threat severity, however, it will probably be considered in the assessment of “intensity” since longer “duration” threats will have greater “intensity” impacts. “Persistence” was not included for similar reasons. “Contribution”, referring to sources, is addressed outside the severity assessment table. “Impact”, as used to describe species or habitat threats, is incorporated in lexicons for Elements 1 and 2.

## CHAPTER 4: ELEMENT 4, ACTIONS

Conservation actions often involve physical management of natural resources, but many other types of actions have been proposed in support of wildlife conservation such as property easements to influence land management, recreational use guidelines, education or outreach, and species reintroduction. In some cases, a lack of knowledge about species' requirements inhibits the planning of these more tangible actions, and research or survey actions are required to fill these knowledge gaps.

A complete description of a proposed action would include who is responsible for the action, what will be done, with what benefits, when and where it will be done, how the desired results will be achieved, how progress will be measured, and why the action is being taken. However, because Wildlife Action Plans are planning documents encompassing the wide range of actions listed above, action descriptions must be adaptable. All actions can be classified and named using one naming convention system but not all actions can be fully detailed using all the descriptive prompts provided for in the Lexicon.

**Action Classification System:** The Northeast Lexicon adopts the Wildlife TRACS action classification system with a small number of amended categories. The system is sufficiently broad in scope with an appropriate level of detail. It is hierarchical, with three tiers. The top tier (listed below) indicates the broadest level of actions. Official TRACS resources (found at <https://tracs.fws.gov/wiki/> in the Classroom Handouts Space) should be used as a reference.

- Coordination and Administration
- Direct Management of Natural Resources
- Data Collection and Analysis
- Education
- Facilities and Areas
- Land and Water Rights Acquisition and Protection
- Law Enforcement
- Outreach
- Planning
- Species Reintroduction and Stocking
- Technical Assistance
- Law and Policy (not in Wildlife TRACS)
- Species Management (such as Harvest Management and Trade Management) (not in Wildlife TRACS)
- Partnerships (not in Wildlife TRACS)

**Action Description:** To address the challenge of systematically describing actions, the Northeast Lexicon provides a set of descriptors that can be used as a template for comprehensive action description (Table 8). The Northeast Lexicon recommends that states strive to provide, for all actions, a name, objective, general strategy, and purpose. This level of description is likely to be appropriate for all actions regardless of the readiness for implementation. The additional descriptors can be selected from as appropriate to describe actions in a Wildlife Action Plan providing a guide for information that would need to be prepared before implementation of the action. For action prioritization, the purpose (identifying target species or habitats and threats), benefits, costs, urgency, and likelihood of success are common factors that are helpful for deriving maximum conservation benefit given limited funding.

**Table 8.** Action descriptors.

<b>Lexicon Terminology</b>	<b>Content</b>	<b>Explanation</b>
<b>Name</b>	The Action name is selected from Wildlife TRACS classification system (amended)	The lexicon described here uses the Wildlife TRACS classification system with hierarchical codes developed. This system includes amendments to incorporate a few actions from the IUCN system (above). Every action should be classified according to the amended Wildlife TRACS system at as detailed a level as possible.
<b>Objective</b>	A concise statement of the objective of the action	An objective is “a specific, measurable, achievable, relevant, and time-limited statement that describes the desired short, medium, or long-term outcomes of a conservation action.”
<b>General Strategy</b>	A concise description of the nature of the strategy for achieving the objective	The strategy to address the objective should be described generally. (More detailed explanation can be provided in the answer to the question “How?”)
<b>Purpose</b>	A statement explaining the species or habitats that will benefit from the action and the threats that will be mitigated	Linking an action to a threat (Element 3) or action driver (Table 9) and to the resource that will benefit such as target species (Element 1) or habitats (Element 2) provides a clear explanation of the motivation for the action and begins to reveal the results chain linking the strategy to the threat and the expected ecosystem response to mitigating the threat.
<b>Benefits</b>	Depending on the action benefits may refer to habitat improvements, species’ responses,	These answers will likely be suggested by defining what the action is and why it is being taken. However, efforts to prioritize actions will probably require specific benefits to be considered. Answering this question



	reductions in threat risk, or public or stakeholder benefits.	clearly may also help define the measures of project success.
<b>Estimated Costs</b>	Several resources are now available to assist in estimating project costs. (One example is Naidoo et al. 2006.) States may, alternatively, use very coarse/relative estimates.	If action descriptions are intended to be used for action prioritization, cost estimates, even very rough ones, may be helpful. This should include total future costs in current dollar values, but not include any past expenses for infrastructure that will be used by proposed action. States may choose to simply categorize costs as High, Moderate, or Low. Estimates are available from business plans, Joint Ventures, and Partners in Flight. For prioritization purposes, states may choose to calculate cost/acre treated or cost/species to compensate for the fact that multi-species projects may be more expensive than single species projects. A very detailed process for action prioritization is described and evaluated in “Optimal Allocation of Resources among Threatened Species: a Project Prioritization Protocol” (Joseph et al. 2009).
<b>Urgency</b>	A relative estimate of the urgency of the action given the severity of the threats and the priority of the species or habitat	The urgency of the action should be addressed by estimating the ideal timeframe for completing the action.
<b>Likelihood of Success</b>	<ul style="list-style-type: none"> <li>• Has the action been implemented in other settings and with what results?</li> <li>• Is there uncertainty in the results chain?</li> <li>• Is there uncertainty in the cost?</li> <li>• Are there any risks or potential unintended consequences?</li> <li>• Are there constraints (e.g. political, land use)?</li> </ul>	In general, this action description is meant to assess “feasibility” for the purposes of prioritization. This might identify areas where more information is needed to be sure that the action will work. It can also identify whether doing the action is a proven winner in other settings but might be applied here.
<b>Implementing Organization</b>	Organizations or individuals responsible for implementing the action or partners who can assist.	If possible, an individual or agency responsible for managing the action could be identified. Partners that should be consulted or engaged could also be identified as could stakeholders.

<b>Affected parties</b>	Some actions will have impacts on stakeholders	
<b>Action Location</b>	The location of the action may be described in terms of habitat types, conservation opportunity areas, geopolitical boundaries, watersheds, or more precise locations within these areas.	Aside from the habitat type, descriptions of where actions take place may include specific locations around the state, specific sites within a smaller locale, or any other geographical designation appropriate to the action. If the action requires monitoring, this description may complement the use of a standard protocol by defining the sampling strategy in a spatial context.
<b>Detailed Strategy</b>	A detailed description of the action, how it will result in the desired effects, how project success will be measured and assessed, and plans for adaptive management	<p>Actions that are ready for implementation may have very developed ideas for accomplishing the objective of the action. Compared to the strategy described above, this is a much more detailed explanation of how the action will be implemented. In cases where actions are not so well developed, this element may include a couple alternatives for implementation.</p> <p>The hypothesis explaining how the proposed action will impact the target by mitigating the threat would ideally be presented in the form of a results chain (See Background and Rationale, below) or theory of change. Wildlife Action Plans are called upon to identify how action results will be monitored so indicators of the impact on the target should be identified along with adaptive management strategies which might be used to improve the results of the action. Monitoring protocols may be identified by reference to standard protocols or development of specific monitoring plans. (Both of these address Element 5).</p>

**Table 9.** A subset of TRACS action drivers complements the IUCN threat list to provide a complete set. “Resource Threats” are included in the TRACS action drivers but are redundant with IUCN threats and not specific enough and have been omitted from the following list. Official TRACS resources (found at <https://tracs.fws.gov/wiki/> in the Classroom Handouts Space) should be used as a reference, this table is provided only as an example.

Level 1	Level 2	Level 3
Resource Management Needs	Resource information collection needs	Need for initial baseline inventory
		Need to update existing information
		Need to answer research question
		Need to develop new technique
	Management decision needs	Need to provide technical assistance
		Need to conduct environmental reviews
		Need for fish, wildlife and/or habitat planning
Recreation Needs	Training needs	Need for more and/or improved training in outdoor recreation methods
		Need to improve safety/ethics in outdoor recreation
	Public access needs	Need for more public access to areas or facilities for outdoor recreation
		Need to maintain or improve quality of areas or facilities for outdoor recreation
	Utilization needs	Need more information on how fish and wildlife resources are utilized
		Need more information on how outdoor recreation areas and facilities are utilized
		Need to provide information on locations of fish and wildlife resources and public access areas and facilities
		Need to maintain or increase recruitment and/or retention of outdoor recreationalists
		Need to maintain or increase supply of fish to support fishing.
Education / Outreach Needs	Education Needs	Need for improved knowledge of fish and wildlife and their habitats
		Need to provide aquatic resources and wildlife education facilities
		Need for improved knowledge of WSFR grant programs and their accomplishments
	Outreach Needs	Need to develop and/or maintain a broad base of support for agency goals and objectives
		Need to maintain and/or increase constituent base
Administrative Needs	Infrastructure Needs	Need to maintain or improve fish and wildlife agency administrative facilities
		Need to maintain or improve information management systems
	Organizational / program planning	Need for agency organizational planning to meet goals and objectives

	needs	Need for WSFR program/subprogram planning to meet goals and objectives
	Coordination / administration needs	Need for agency administrative support for effective operations
		Need for coordination for effective program/project management

## BACKGROUND AND RATIONALE

State Wildlife Action Plans must describe actions proposed to conserve identified species and habitats and priorities for implementing such actions are needed to develop a plan for wildlife conservation.

In addition to this Wildlife Action Plan requirement, the Best Practices Report recommends the use of the IUCN Hierarchical Action Classification System (Salafsky et al. 2008). Actions are described as “abating known threats” and involving “metrics to measure effectiveness”. An important recommended best practice involves the prioritization of actions using decision theory approaches that consider resource vulnerabilities but also cost, feasibility, and likelihood of success (e.g. pg 5, 14-15).

Given the benefit of using action terminology that is largely compatible with the Wildlife TRACS system, and the desire to clearly justify each action, the Northeast Lexicon connects actions with threats and/or action drivers and species or habitats to show exactly how the action contributes to state wildlife conservation.

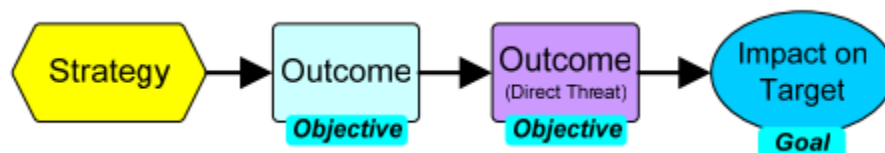
The Best Practices Report identifies “a need for more specificity with regard to on-the-ground actions”. During the Development of this Northeast Lexicon, S.M.A.R.T implementation goals (*citation*) were discussed as a way to improve the clarity of action descriptions in response to the Best Practices Report’s recommendation. S.M.A.R.T. goals are Specific, Measurable, Attainable, Relevant, and Time-bound. Because Wildlife Action Plans are planning documents and some proposed actions will not be ready for implementation, it may be difficult to describe these aspects of an action – but being able to answer these questions improves the likelihood of implementation and project success.

The action descriptors listed here were developed based on S.M.A.R.T. planning and are well-aligned with the action development process outlined in the Conservation Measures Partnership’s Open Standards for the Practice of Conservation (CMP 2013). Steps 1 and 2 (see figure below) are the basis of the action development process provided in the “Suggestion for Use”. Steps 3, 4, and 5 call on information provided in the Northeast Lexicon for Elements 4 and 5.

While the Northeast Lexicon does not specifically recommend any existing prioritization method, advice from the best practices helped ensure that the Lexicon incorporated information typically used in action prioritization. The Lexicon also generally provides the information required for the prioritization method presented and evaluated in “Optimal Allocation of Resources among Threatened Species: a Project Prioritization Protocol” (Joseph et al. 2009)



Using a results chain can provide explicit documentation of the linkages between the action, threat, threat mitigation, targets and indicators (Foundations of Success 2007):



The Strategy explains, generally, how the “Objective” of the action will be achieved. The first outcome identifies the threat or action driver that is motivating the action. The second

outcome identifies the change in the threat, or the mitigation of the threat, that is expected to result in the positive impact on the target or the goal. See *Using Results Chains to Improve Strategy Effectiveness: An FOS How-To Guide* to learn more about creating results chains.

## CHAPTER 5: ELEMENT 5, MONITORING

To increase the capacity of the region to share data and to minimize the replication of work developing monitoring plans, monitoring plans would be detailed consistently and shared within the region as much as possible. The three distinct purposes for monitoring (assessing project results, measuring population status and trends, and describing habitat quality) called for in Elements 1, 2, and 4 suggest unique formats. Status assessments of species or habitats are referred to as ‘surveys’, ‘research’ includes monitoring to understand links between species, their habitats, and threats impacting both, and assessing the results of ‘actions’ implies a more dynamic situation resulting from implementing a project in an attempt to mitigate a threat or otherwise support a Species of Greatest Conservation Need.

### **Assessing the effectiveness of conservation actions**

Monitoring plans aiming to assess project results should follow the guidance provided by the Association of Fish and Wildlife Agencies in “Measuring the Effectiveness of State Wildlife Grants” (Association of Fish and Wildlife Agencies 2011). This framework is premised on the definition of a theory of change linking the action with intermediate results, threat reduction, and the conservation target outcomes. (This approach to action planning is also supported by the Northeast Lexicon for Element 4.) Several effectiveness measures may be identified to assess intermediate results, especially in the case of actions with results expected on the long-term.

Measures of success should be (Association of Fish and Wildlife Agencies 2011) (pg 9):

- Linked – tied to key factors in the theory of change laid out in the results chain
- Measureable – in either quantitative or qualitative terms
- Precise – defined the same way by all agencies
- Consistent – unlikely to change over time
- Sensitive – changing proportionately in response to actual changes in the condition or item being measured
- Overarching – available to be measured at various points through the life of a project
- Achievable – not onerous for states or their partners to support.

To improve consistency, the suggested measures terminology used in Wildlife TRACS should be used to measure action outcomes.

### **Measuring population status and trend**

Region-wide use of standard protocols would facilitate data-sharing and make possible an assessment of population status and trend throughout the region. Standard protocols for some

species have been developed (e.g. Grassland Bird Protocol and Standard Operating Procedures). Required elements of monitoring plans differ between species groups, between species using different habitat types, and between monitoring programs with differing objectives. To enhance the possibility of comparing monitoring protocols between states, monitoring protocols should identify target species, monitoring goals (e.g. estimating abundance and trend, understanding demography, behavior, habitat use, reproduction, etc.), the reference protocol, and contact information for an office or individual familiar with the protocol.

### **Describing Habitat Quality**

Monitoring programs for habitat quality may include soil, vegetation, climate monitoring or any variable hypothesized to influence the use of a place by a species. Unlike species population surveys which are prompted by the need for Wildlife Action Plans to describe wildlife abundance and trend, habitat monitoring is used to explain species' population trends (a research action), design conservation actions in support of single or multiple species, or measure achievement of objectives of conservation actions. Standard protocols may be useful in developing effective, efficient habitat monitoring programs. For example, the Forest Inventory and Analysis plot protocol measures tree species, age classes, shrub and herbaceous cover, snags, and fuel loads – all of which characterize forests and can be used as surrogates for wildlife habitat, not to mention assessing fire risk. The USFS Field Guide for Invasive Plant Inventory, Monitoring, and Mapping Protocol is another example of an existing tool that could be employed by Wildlife Action Plans when invasive plants threaten habitat quality. In general, habitat monitoring protocols should identify the target habitat and the purpose for monitoring.

### **BACKGROUND AND RATIONALE**

State Wildlife Action Plan must propose plans to monitor Species of Greatest Conservation Need (Element 1) and their habitats (Element 2), for monitoring the effectiveness of conservation actions (Element 4), and for adapting these conservation actions to respond appropriately to new information or changing conditions.

The Best Practices Report recognizes that “Assessing and reporting on the success of Wildlife Action Plans as required by Element 5 is extremely challenging due to the complexity of biological and ecological interactions, and the extended timeframes often required for conservation benefits to become apparent.” “Measuring the Effectiveness of State Wildlife Grants: Final Report” (Association of Fish and Wildlife Agencies 2011) provides specific guidance to compensate for these challenges.

A strong movement throughout conservation organizations toward standardized protocols supports the Northeast Lexicon philosophically and technically. The Best Practices Report



specifically recommends the use of standard protocols because it facilitates data integration and provides a more complete picture of the status of wildlife across political jurisdictions and spatial scales. These best practices also recognize the importance of monitoring to demonstrate the effectiveness of conservation actions and documenting the long-term benefits to fish and wildlife populations. Projects supported by Northeast Regional Conservation Needs funds, such as The Northeast Bird Monitoring Handbook (Lambert et al. 2009) and development of regional species monitoring protocols, provide detailed guidance for species and habitat monitoring in the northeastern states. The National Park Service Inventory and Monitoring Program provides a database of standard protocols (<https://irma.nps.gov/App/ProtocolTracking>) which may provide a useful example for the northeast region in the future.

The exhaustive investigation of effectiveness measures published by the Association of Fish and Wildlife Agencies (Association of Fish and Wildlife Agencies 2011) and slated for incorporation in Wildlife TRACS provides a level of consistency nationwide that was seen as the best-developed guidance to date. The Northeast Regional Conservation Needs project “Regional Monitoring and Performance Framework” (Stem et al. 2008) provided earlier progress toward the standards developed in the national guidance put forth by the Association of Fish and Wildlife Agencies.

## CHAPTER 6: ELEMENT 6, PLAN REVIEW

The Best Practices Report provides the most current comprehensive source for Wildlife Action Plan preparation guidance. The Best Practices Report includes valuable guidance on many topics not incorporated in the Lexicon. Here we have highlighted important aspects as a reference and focused on aspects of review that may be of interest in comparing State Wildlife Action Plans.

Type of review	Comprehensive Review	Major Revision	Minor Revision
Date of Review	At a minimum, every 10 years. (October 1, 2015)	No deadline: a state may choose to do a major or minor revision at any time. These revisions do not restart the 10-year clock for comprehensive review.	
Summary of Changes	A tabular summary of any changes made as a result of any revision, and where those changes can be found is needed.		
Explanation of No Change	Document and explain why no changes were necessary after review, and describe the process used to make that determination including public review	There is no explanation needed for any sections of the document that remain unchanged after major or minor revisions.	
Web access to Plan	Wildlife Action Plans are not required to be posted online however most states do post them. A regional website listing these links would be a valuable resource for regional conservation organizations and other states. In addition, online locations for data sources, partner organizations, and any supporting information should be listed.		
Public Review	Public Review is required (Element 7&8) for the entire Wildlife Action Plan.	Public Review is required (Element 7&8) only for portions of the plan under revision.	Public Review is not required.
Documentation of Public Review	Document specific roles and measures of success for conservation partner teams that contribute information and complete tasks. Provide mechanisms for conservation partner engagement and provide regular updates (e.g. crosswalks, online comment retention)		
Taxa experts	For key taxa or other scientific questions outside the expertise of state staff, outside partners (e.g. taxa-based or targeted professional societies, conservation organizations, other agencies with authority, or universities) should be engaged to develop assessments of conservation need, habitat use, threats, actions, or monitoring plans.		

## BACKGROUND AND RATIONALE

State Wildlife Action Plan Requirements include the need to describe procedures to review the plan at intervals not to exceed ten years.

States should refer to the Best Practices Report for additional requirements and detailed suggestions for implementing comprehensive review and major or minor revision.

## CHAPTER 7: ELEMENT 7 AND 8, PUBLIC PARTICIPATION

The *public* is the general, uninvolved public and, for the purposes of Wildlife Action Plan communications, the goal is to inform them of the process and results through standard media outlets.

*Stakeholders* are interested or affected groups or individuals and the goal is to inform and involve them in the planning and implementation processes.

*Partners* are collaborators and the goal is to involve and engage them in the planning and implementation processes and inform them of progress. Wildlife Action Plans should list any formalized partnerships.

Partners usually include federal, state, and local government agencies, as well as private conservation organizations, and other parties. The following are examples of these partners:

### **Governmental:**

- Federal agencies (e.g. US Fish and Wildlife Service, US Forest Service, US Department of Agriculture, US National Park Service, US Natural Resource Conservation Service, and any other federal agency managing natural resource within a state.)
- Tribal Nations
- State agencies (e.g. Departments of Transportation, Parks, Forests, Planning, and any other state agency affecting natural resources)
- Local municipalities (counties, townships or other municipal designation)

### **Non-governmental organizations:**

- Non-Profit Conservation Organizations (Local, State, Regional, National)
- Recreational Organizations (Local, State, Regional, National)
- Scientific Societies and Institutions
- Academic Institutions

**Committees:** List committees and members. Consider needed skills, knowledge, and authority in composing committees. An example of an advisory committee charter with roles and responsibilities from Pennsylvania is provided in Appendix C.

**Communications Plan:** Identify key constituent groups and audiences. Set goals for each. Develop outreach strategies and vehicles for receiving input from these groups. Ask partners to help with outreach by relaying information and requests for comment to their constituents. Link the Wildlife Action Plan to established community values. (See Appendix C for an example communications plan matrix to identify audiences and outreach methods based on Bleicher.)

## BACKGROUND AND RATIONALE

State Wildlife Action Plan requirements include a plan for coordinating the development, implementation, review, and revision of the 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.

In addition, broad public participation is an essential element of developing and implementing these plans, the projects that are carried out while these plans are developed and the species in greatest need of conservation.

States may find useful guidance in the USFWS Human Dimensions team and the Cornell University Department of Natural Resources Human Dimensions Research Unit.

## SECTION III: CONCLUSION AND RECOMMENDATIONS

### *Recommendation*

The Northeast Association of Fish and Wildlife Agencies Fish and Wildlife Diversity Technical Committee should continue to work toward development of a regional web-accessible database to house individual state's Wildlife Action Plan content. The completed Lexicon forms the foundation of a regional database that will facilitate the sharing of information between states. Such a database will help states share information on priority species, known threats for these species and needed actions to address these threats – the required elements of State Wildlife Action Plans. A Northeast State Wildlife Action Plan database will:

1. Enhance consistency of information for species including taxonomy and nomenclature, conservation status in state, national and global systems, and literature references, preventing each state from having to individually compile this information;
2. Facilitate access to northeast State Wildlife Action Plans for state agencies, federal agencies, conservation partners, legislators and the public;
3. Facilitate more effective and efficient collaboration within and between NEAFWA states;
4. Improve accuracy of data transfers between states;
5. Assist NEAFWA in prioritizing regional conservation needs, focused on common threats across state lines.

### *Next Steps*

#### **Implement the common lexicon through the 2015 State Wildlife Action Plan revision process and refine language as needed.**

Those participating in the development of State Wildlife Action Plans are encouraged to use this lexicon during their congressionally required comprehensive review and revision and assist in refining the language and processes as needed. Through use of the lexicon such refinements may be prompted as approaches are discovered that meet the needs with less work effort, components that work better for prioritization processes, or alternative terminology that increases the compatibility of the Northeast Lexicon with related systems nationwide.

#### **Form a Northeast Lexicon Working Group comprised of Northeast Wildlife Diversity Program Managers and State Wildlife Action Plan Coordinators.**

Achieving the ultimate vision of a web-accessible database involves several more steps, yet it can be accomplished in a relatively short timeframe given the work accomplished to date through this project. The Lexicon outlines the data content, but the database will need an

intuitive user interface, a potentially complicated network of relationships between elements, and a management system for quality control and updating data. A working group representing the northeast state agencies (Wildlife Action Plan Coordinators, Data Managers and other staff as appropriate), USFWS LCC and Region 5, and key NGO partners should be convened to advance this discussion, leading to development of a pilot database application.

#### **Develop a Northeast State Wildlife Action Plan database application**

The Northeast Lexicon Working Group and a database developer should convene to work through development steps including:

1. Define the key/priority functions of the database application (mostly done)
2. Determine the scope of the database to meet the key functions (mostly done)
3. Trial implementation of the Lexicon, with coordination and technical assistance, during Wildlife Action Plan revisions (2013-2014)
4. Develop a database application (2014)
5. Test the database (2015)
6. Refine the database as needed (2015)
7. Launch the database application (2016)

#### **Work with the Northeast Conservation Information and Education Association to refine terminology related to outreach for incorporation in a toolkit to support states in their State Wildlife Action Plan revision and implementation.**

The support of partners, stakeholders, and the public is essential to both the revision process and to the implementation of State Wildlife Action Plans. While states may differ in the composition of these audiences, the approaches used to communicate with each of them will be similar. Wildlife Action Planners anticipate using a combination of media such as websites, press releases, public events, and focused meetings to engage partners, stakeholders, and the public. The toolkit will encourage the use of common terms and shared outreach processes and methods for regional outreach consistency and effectiveness.

#### ***Conclusion***

This effort has been a productive exercise in adaptive management that has reflected the evolving needs of the states and their partners in the development of the State Wildlife Action Plan revisions. State Wildlife Action Plans have been criticized for their lack of consistency in terminology that would allow wildlife managers, land managers and conservation partners to effectively and efficiently compare conservation priorities across state borders, thereby advancing landscape-scale conservation for Species of Greatest Conservation Need. The Northeast Fish and Wildlife Diversity Technical Committee had a vision to address this

shortcoming – develop a common language for State Wildlife Action Plan elements to allow the thirteen states and District of Columbia to ‘roll-up’ state-level priorities within a searchable framework to inform regional priorities. The foundation for the database was built through this Northeast Lexicon project. This unprecedented collaboration is nationally regarded as a model for effective landscape-scale conservation.

The Lexicon serves as a communication and coordination tool. By constructing cohesive sets of components to meet the requirements for each Wildlife Action Plan element and adopting terminology for each, the Northeast Lexicon facilitates the intra- and inter-state coordination needed to manage wildlife and their habitats with maximum efficiency and effectiveness. It facilitates translation between State Wildlife Action Plans, enables a regional context, and a formal structure through which states can learn from each other to integrate new planning resources and improve planning processes. These benefits will be maximized while states implement the Lexicon during the 2015 Wildlife Action Plan revision process.



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## SECTION V: APPENDICES

### APPENDIX A: JUNE 2013 LITERATURE REVIEW

This report was prepared for the Northeast Fish and Wildlife Diversity Technical Committee by Stephanie Eggers.

#### **Synthesizing and Summarizing Conservation Decision Tools for State Wildlife Action Plans (Final June, 2013)**

A State Wildlife Action Plan (SWAP) database tool is envisioned by the Northeast Fish and Wildlife Diversity Technical Committee (NEFWDT) to be a tool primarily for delivery of SWAPs, and secondarily for development of plans. Language and consistent operational definitions for important terms (e.g. threats, conservation actions, habitats), and the agreement to the use of those terms and their operational definitions, are needed for species of greatest conservation need (SGCN). The following will examine the similarities and differences between the agreed-to terms (per Philadelphia meeting) of the Northeast (NE) Region Draft “lexicon” and other similar efforts undertaken, developed and published by conservation organizations and within peer-reviewed literature. This literature review report strives to contribute to advancing common agreement on terms and definitions.

#### **Threats assessment for SGCN**

Preliminary terms were chosen by NEFWDT to describe threat assessment and include *Spatial Extent*, *Intensity*, *Reversibility*, *Likelihood of Impact and Occurrence*, *Cumulative and Compounding*, *Immediacy*, *Duration*, and *Persistence*. These terms were then compared with terminology for threats found through the literature search (Table 1). The same or analogous terms were found for *Spatial Extent* (*scope*), *Intensity* (*severity*), *Reversibility* (*irreversibility*), *Likelihood of Impact and Occurrence* (*probability*), and *Immediacy* (*urgency*). Further details regarding the definition of the terminology and scoring/ranking criteria are described below and also included in Appendix A. For a regional approach any combination of these threat criteria can be used to identify the dominant, regional threats for a given ecoregion. Rationalization for conducting a regional approach of threats will only be increased as more terms are considered in an assessment (Wisdom et al. 2003).

#### Spatial Extent

The NE Draft Lexicon defines *Spatial Extent* as the percentage of threat to the applicable area - distribution of threat within a state (spp, habitat or threat). However, the term *scope* was used more often by conservation organizations and throughout the literature rather than *Spatial Extent*. Earlier versions of threat assessment by organization used the term *extent* such in TNC Southeastern Division (2003) and WWF (Ervin 2002) or other terms such as *proportion of the area/area* have also been used (WCS Living Landscapes and Salafsky & Margoluis 1999). *Spatial Extent* or *pervasiveness* of the threat across the ecoregion was used by Wisdom et al. (2003).

In the NE Draft Lexicon, *Spatial Extent* of threats is scored/ranked by percentages 76-100%, 51-75%, 26-50%, and 0-25%. NatureServe (2012) scored *scope* by percentages into *pervasive* (71-100%), *large* (31-70%), *restricted* (11-30%), *small* (1-10%). IUCN (2102) *scope* categories include *whole*, *majority*, *minority*, and *negligible*, while TNC (2007) categorizes *scope* into *very high*, *high*, *medium*, and *low* categories. CMP (2007) and WWF (2007) also assumes the same categories as TNC (2007) and ranks *scope* by percentages similar to NatureServe (2012)

**Specific Threat Variables Used by Different Systems** Variables in each column are used in an analogous fashion.

Systems	Variables Used by Different Systems									
NatureServe April 2012	Scope	Severity					Timing (immediacy)	Impact Magnitude		
IUCN 2012	Scope	Severity						Impact		
TNC CAP 2007	Scope	Severity	Contribution	Irreversibility						
TNC's SE Division 2003	Extent (% targets)	Severity								
TNC 5-S (precursor to CAP) 2000	Scope (spatial)	Severity	Contribution	Irreversibility						
CMP. 2007. Open Standards	Scope	Severity		Permanence/ Irreversibility			Urgency			
WWF Project & Programme Standards 2007	Scope	Severity		Irreversibility Permanence						
WWF RAPPAM 2002	Extent			Permanence	Probability			Impact & Trend		
WWF Root Causes	Scope			Permanence				Impact		
Ecoregional Assessments: Standard 10. 2006	Scope	Severity					Time			
WCS Living Landscapes	Proportion	Severity		Recovery Time	Probability		Urgency			
Salafsky et al. 2003	Scope	Severity	Contribution	Reversibility	Likelihood		Timing	Magnitude (Scope and Severity)		
Bunnell et al.2009							Immediacy	Magnitude		
Salafsky & Margoluis 1999	Area	Intensity					Urgency			
Wisdom et al. 2003	Spatial Extent								Timeframe required	
Case Study: Caribbean										Persistence
Florida WAP	Scope	Severity		Irreversibility				Degree to which they contribute		
Draft NE Lexicon	<b>Spatial Extent</b>	<b>Intensity</b>		<b>Reversibility</b>	<b>Likelihood of Impact and Occurrence</b>	<b>Cumulative and Compounding</b>	<b>Immediacy</b>		<b>Duration</b>	<b>Persistence</b>

*very high* (71-100%), *high* (31-70%), *medium* (11-30%) and *low* (1-10%). The Ecoregional Assessment and Biodiversity Vision Toolbox (2006) categorizes *scope* of threats and their *severity* to the target occurrences and areas as *widespread* (>50% are affected by the threat), *common* (10-50%), and *limited* (<10%). Salafsky et al. (2003) rated *scope* much differently and subdivided *scope* into *scope (spatial)* and *scope (percentage of targets)*: *Scope (spatial)* is defined as the area of the project site (or target occurrence) affected by a threat within 10 years (4 = *throughout* (>50%), 3 = *widespread* (15 – 50%), 2 = *scattered* (5 – 15%), 1 = *localized* (< 5%)). *Scope (percentage of targets)* is defined as the number of target occurrences affected by a threat within 10 years (4 = *most or all* (>50%), 3 = *many* (25 – 50%), 2 = *some* (5 – 25%), 1 = *few* (< 5%)).

### Intensity

The NE Draft Lexicon defines *Intensity* similar to the way others define *severity* of threat. The term *severity* was used more often by conservation organizations and throughout the literature than *Intensity*. Other than in the NE Draft Lexicon, the term *Intensity* was only used in Salafsky and Margoluis 1999.

NatureServe (2012) and others WAPS (e.g. Florida Wildlife Conservation Strategy ) do not use the past threats to describe threat impact, considering only present and future threats, whereas IUCN allows for past, ongoing, or future. NatureServe, IUCN, CMP, TNC, WWF all use a similar time frame for assessing the *severity* of threats either within a 10-year window or three species generation time frame whichever is longer (not to exceed 100 years). However, TNC (2000, 2007) also measures *severity* as the level of damage to the conservation target that can reasonably be expected within 10 years under current circumstances. TNC (2007) makes note that some threats, such as climate change or invasive species may not fully express themselves over a 10-year time frame. To this end, practitioners may wish to consider a longer time horizon for some threats if appropriate but should be sure to document their decisions. Similar effort such as Florida WAP (2005) and Salafsky et al (2003) measure the degree to which a threat has an impact on the viability/integrity of targets within the project area within 10 years only.

In the NE Draft Lexicon, the proposed categories for scoring/ranking the *severity* of threats are *high*, *medium* and *low*; and are similar to TNC (2007) and CMP (2007) that measures *very high*, *high*, *medium*, and *low*. IUCN categories for *severity* include *very rapid*, *rapid*, *slow*, and *negligible* (IUCN 2012). CMP (2007) and WWF (2007) scored *severity* by percentages and similar category terms: *Very High* (71-100%), *High* (31-70%), *Medium* (11-30%), and *Low* (1-10%). NatureServe (2012) is also scored by percentages, but by different category terms: *extreme* (71-100%), *serious* (31-70%), *moderate* (11-30%), *slight* (1-10%). Salafsky et al (2003) rated *severity* much differently (4 = *serious damage or loss*, 3 = *significant damage*, 2 = *moderate damage*, 1 = *little or no damage*).

### Reversibility

The NE Draft Lexicon defines *Reversibility* as the degree to which the impact of the threat is reversible. *Reversibility* was used by different conservation organization and the literature as well as the terms *irreversibility* and *permanence*.

The NE Draft Lexicon scores *Reversibility* with a yes/no option. CMP (2007) and WWF (2007) ranks/score *permanence (irreversibility)* as *very high* - the effects of the threat cannot be reversed, it is very unlikely the target can be restored, and/or it would take more than 100 years to achieve this; *high* - the effects of the threat can technically be reversed and the target restored, but it is not practically affordable and/or it would take 21-100 years to achieve this; *medium* - the effects of the threat can be reversed and the target restored with a reasonable commitment of resources and/or within 6-20 years; and *low*- the effects of the threat are easily reversible and the target can be easily restored at a relatively low cost and/or within 0-5 years.

While Salafsky et al. (2003) scored/ranked *Reversibility* numerically: 4 = *irreversible* e.g., extinction, 3 = *reversible with difficulty*, 2 = *reversible with some difficulty* and 1 = *easily reversible*.

### Likelihood of Impact and Occurrence

The NE Draft Lexicon uses similar terms to those found in the literature, *likelihood* and *probability*, but was only seen in Salafsky et al. (2003), WWF (2002), and WCS (2002). The NE Draft Lexicon scored *Likelihood of Impact and Occurrence* as *high*, *medium*, *low*, and *none*. Salafsky et al. (2003) score/ranked *likelihood* as the probability that a threat will occur within the next 10 years numerically: 4 = *existing threat* (100%), 3 = *high probability* (50-99%), 2 = *moderate probability* (10-49%) and 1 = *low probability* (0-9%).

### Cumulative and Compounding

No similar terms or scoring/ranking criteria was found during this literature search.

\*\*Internal note: Do we need to revisit whether to should include Cumulative and Compounding?

### Immediacy

The NE Draft Lexicon defines *Immediacy* as the temporal scale of the threat. Other interchangeable terms such as *urgency* (Salafsky and Margoluis 1999, WCS 2002, CMP 2007) and *timing* (Salafsky et al. 2003 and Ecoregional Assessment and Biodiversity Vision Toolbox 2006,) as well as *immediacy* (Bunnell et al. 2009 and NatureServe 2012) were found during the literature search.

The NE Draft Lexicon scored *Immediacy* as *long term*, *near term*, and *now*, which is similar to NatureServe (2012) and Salafsky et al. (2003). NatureServe (2012) scores *timing (Immediacy)* as *high* (continuing), *moderate* (could happen in the short term), *low* (could happen in the long term), and *insignificant/negligible* (only in the past and unlikely to return). This scoring was based on Birdlife International and draft proposed IUCN-CMP (and NatureServe) scoring of threat timing. Salafsky et al. (2003) defined *timing* as the time until a threat will start having impact on targets and scored it numerically: 4 = *current* (< 1 year), 3 = *imminent* (1-3 years), 2 = *near-term* (3-10 years), and 1 = *long-term* (> 10 years). Bunnell et al. (2009) scored *Immediacy* of the threat as *high*, *medium* and *low*.

### Duration

The NE Draft Lexicon scored *Duration* as *less than a year*, *1–5 years*, *6–10 years*, or *greater than 10 years*. One term found during the literature search is *timeframe required* (to implement effective treatments across the ecoregion); although no scoring was available (Wisdom et. al 2003). No terms analogous to *Duration* were found.

\*\*Internal note: Does this mean we should revisit inclusion of Duration?

### Persistence

The NE Draft Lexicon defines *Persistence* as the “degree to which the cause (threat) is persistent over time in the absence of action” and scored it as *inevitable*, *highly likely*, *probable*, *unlikely*, and *none*. In this search of the literature, only one source was found that used *Persistence* (Case Study 2006). This use of “persistence” was not analogous to that defined in the NE Draft Lexicon as it referred to the persistence of the target as opposed to the threat, i.e., *Persistence* was defined as “the degree to which a particular habitat, community or population will tend to retain its present status should the current level of human pressure on the system remain unchanged. *Persistence* was scored/ranked as *highest*, *high*, *moderate*, *low*, and *unknown* (Case Study 2006).

### Threat terms used by others with no analogous term in the NE Draft Lexicon

#### *Contribution*

TNC (2000, 2007) similarly define *contribution* as the expected contribution of the source, acting alone, to the full expression of a stress (as determined in the stress assessment) under current circumstances (i.e., given the continuation of the existing management/conservation situation). TNC (2007) scored/ranked *contribution* as *very high* - the source is a very large contributor of the particular stress; *high* - the source is a large contributor of the particular stress; *medium* - the source is a moderate contributor of the particular stress; and *low* - the source is a low contributor of the particular stress. Salafsky et al. 2003 also include *contribution* as a threat assessment term, defining it as the degree to which a threat causes multiple and cascading threats and/or has widespread ecological impact, scoring it numerically as 4 = *very high*, 3 = *high*, 2 = *moderate*, and 1 = *low*.

#### *Impact/Magnitude*

NatureServe (2012) defined threat *impact* (or *magnitude*) as the degree to which a species or ecosystem is observed, inferred, or suspected to be directly or indirectly threatened in the area of interest. The *impact* of a threat is based on the interaction between assigned *scope* and *severity* values, and includes categories of *very high* (75% declines), *high* (40%), *medium* (15%) and *low* (3%). Threat *impact* is calculated considering only present and future threats. IUCN (2012) has a similar definition and scoring. Threat *impact* scores are a measure between *scope* and *severity* values and include categories of *high impact*, *medium impact*, *low impact*, and *negligible/no impact* (IUCN 2012). However, WWF (Ervin 2002) defined *impact* differently as “the degree, either directly or indirectly, to which the threat affects overall protected area resources.”

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#### **Conservation Actions assessment for SGCN**

Preliminary terms were chosen by NEFWDT to describe conservation action assessment and include *Feasibility*, *Effectiveness*, *Funding Availability*, *Capacity Internal and External*, *Immediacy*, *Sequencing*, *Support for Action*, *Duration*, and *Cost Estimate*. These terms were then compared with terminology for conservation action assessment found through the literature search (Table 2). The same or analogous terms were found for *Feasibility* (*probability*)



**Table 2. Specific Conservation Action Variables Used by Different Systems** Variables in each column are used in an analogous fashion.

Systems	Variables Used by Different Systems									
NatureServe April 2012	Probability of Success			Availability of Funds	Personnel to carry out such actions & Legal frameworks					
IUCN 2012	Probability of success			Availability of Funds	Personnel to carry out such actions & Legal frameworks					
TNC CAP 2007	Feasibility ➤ Lead individual and institution ➤ Ability to motivate key constituencies ➤ Ease of implementation		Benefits? ➤ Scope and scale of outcome ➤ Contribution ➤ Duration ➤ Leverage						Duration (subhead of Benefits)	Cost ➤ One time cost ➤ Annual costs ➤ Staff time ➤ Number of years
TNC Ecoregional Status Measures Version 1.0 2007		Intent	Effective Management Potential						Tenure	
TNC Southern U.S. Regional Office 2006	Feasibility		Leverage	Funding				Presence of Support in Key Agencies & Partners/ AND Stakeholder Support/ Opportunity		
TNC 5-S (precursor to CAP) 2003				Adequate Funding	Project Leadership and Support		Strategic Approach			
TNC Landscape Practioners Handbook 2003	Feasibility ➤ Lead individual and institution ➤ Ability to motivate key constituencies ➤ Ease of implementation		Benefit? ➤ Threat Abatement ➤ Viability Enhancement ➤ Contribution ➤ Duration ➤ Leverage	Funding	Leadership and Support  AND  Legal Framework			Community & Constituency Support	Duration (subhead of Benefits)	Cost
CMP. 2007. Open Standards	Feasibility		Potential Impact							
NC WAP Chapter 6 Synthesis of Conservation Priorities	Feasibility (cost/ benefits analysis)		Benefit	Funding				Partnerships/ Opportunity		
Georgia WAP	Probability of		Providing Multiple	Addressing		Timeliness	Connections with	Building Public		

	Success		Benefits for High Priority Species/Habitats & Overall Importance	Un(der)funded Needs		or Urgency	Other Conservation Actions	Support		
Florida WAP	Feasibility		Benefit				Sequencing (not included but mentioned as important)			Cost
Davis et al. 2003	Feasibility							Flexibility (engaging stakeholders)		
Bunnell et al.2009	Feasibility									
Draft NE Lexicon	Feasibility		Effectiveness	Funding Availability	Capacity Internal and External	Immediacy	Sequencing	Support For Action	Duration	Cost Estimate

of success), *Effectiveness (benefit)*, *Funding Availability*, *Capacity Internal and External (leadership and support & legal framework)*, *Support for Action (stakeholder support)*, *Duration*, and *Cost Estimate*. Further details regarding the definition of the terminology and scoring/ranking criteria are described below and also included in Appendix B. Specific conservation action variables used by different systems were compared in an analogous fashion.

### Feasibility

The NE Draft Lexicon defined *Feasibility* as conservation action that is capable of being done or carried out; capable of being used or dealt with successfully; reasonable, likely. *Feasibility* was a common term used to evaluate conservation actions found within the literature (Sutter and Szell 2006, TNC 2003 and 2007, CMP 2007, NC WAP 2005, FL WAP 2005, Davis et al. 2003, Bunnell et al. 2009). TNC (2006) elaborated on this definition as a measure of how likely conservation success (based on conservation of the majority of conservation targets by implementation of priority strategies) can be obtained at a conservation area. Further, *Feasibility* is a combination of the ease of implementation of the project (for example, logistics, number of landowners) and the ecological integrity of the site (TNC 2006). TNC (2007) emphasizes that overall *Feasibility* of a strategic action is based on three factors: Lead individual and institution, the ability to motivate key constituencies, and the ease of implementation. NC and Florida WAPS more simply define *Feasibility* as a cost/benefit analysis and the ease of implementation, respectively. Bunnell et al. 2009 adds that *Feasibility* has little relation to status or risk, but is critical in planning and establishing priorities. NatureServe (2012), IUCN (2012), and the Georgia WAP (2005) used a different term, *probability of success*. The Georgia WAP (2005) defines *probability of success* as the conservation action is likely to succeed because it employs tested methodologies, has strong support from stakeholders, and has clearly identified and readily achievable objectives.

The NE Draft Lexicon scored/ranked *Feasibility* as 1 (*low capacity for being done/carried out*) to 3 (*high capacity for being done/carried out*). TNC (2003) did score/rank three factors that contribute to *Feasibility* from *very high*, *high*, *medium*, and *low* for lead individual and institution, the ability to motivate key constituencies, and the ease of implementation. CMP (2007) also scores/ranks *Feasibility* on a similar scale (*very high* to *low*) and Bunnell et al. (2009) *high*, *medium*, and *low*.

### Effectiveness

The NE Draft Lexicon defines *Effectiveness* as producing a decided, decisive, or desired effect. Only TNC (2007) used a similar term, *effective management potential* which was defined as the potential for an entity to be effective in implementing activities to achieve stated protection and/or management objectives. Other analogous terms that were used were *benefit*, *potential impact leverage*, and *providing multiple benefits for high priority species/habitats & overall importance*. *Benefit* was further defined as *scope* and *scale of outcome*, *contribution*, *duration* and *leverage* by TNC (Higgins et al. 2007). TNC (Low 2003) also further defined *benefit* as *threat abatement*, *viability*, and *enhancement*, as well as *contribution*, *duration*, *leverage*. Both the North Carolina (2005) and Florida (2005) WAPS included the term *benefit* in their conservation action assessments. CMP (2007) used the term *potential impact* and asked the question if implemented will the strategy lead to desired changes in the situation at the project site?

The NE Draft Lexicon scores *Effectiveness* as 1 (*low probability of having desired effect*) to 3 (*high probability of having desired effect*). *Effective management potential* was ranked by TNC (Higgins et al. 2007) as *very good* (*adequate likelihood*), *fair* (*inadequate likelihood*) and *poor* (*no likelihood*) of activities achieving the designated intent. CMP (2007) scoring/ranking of *potential impact* was *very high*, *high*, *medium*, and *low* for contributing to meaningful threat mitigation or target restoration. TNC (Low 2003) scored the individual components under *benefit* (also *threat abatement*, *viability*, *enhancement*, *contribution*, *duration* and *leverage*) on a similar scale (*very high* to *low*). Florida WAP also ranked similarly.

### Funding Availability

The NE Draft Lexicon described *Funding Availability* as present and ready for use; at hand; accessible; capable of being gotten; obtainable. Several other organizations noted the importance of *Funding Availability* when assessing conservation actions (e.g. NatureServe 2012, IUCN 2012, TNC 2003 and 2006). Funding may come from both private and public sectors and be available through a variety of mechanisms and sources, such as appropriation of public funds, contributions by donors, endowment, and other sources (Low 2003) or match opportunities (NC WAP 2005).

The NE Draft Lexicon scored/ranked *Funding Availability* as 3 (*funding in hand*), 2 (*funding is available but no earmarked*), and 1 (*no funding*). TNC (2006) ranked *funding* on an ordinal scale *very high*, *high*, *medium*, or *low* and then translated into numeric values from 1-4 (*low* = 1, *very high* =4) and funding was weighted by 2. TNC (Low 2003) ranked funding on a similar scale, *very high* to *low*.

#### Capacity Internal and External

The NE Draft Lexicon described *Capacity Internal and External* as the facility or power to produce, perform, or deploy individual actions not the plan as a whole. NatureServe (2012) and IUCN (2012) described similar actions such as the *personnel to carry out such actions & legal frameworks* similar to TNC (Low 2003) with *leadership and support & legal framework* and TNC (2003) *project leadership and support*. Low (2003) describes the necessary *staff leadership, multidisciplinary team* (could be onsite or partner organizations), and *institutional leadership* (some combination of institutions is providing leadership for developing and implementing conservation strategies at the project area). *Legal framework* includes the existence of an appropriate framework of protection tools and policy instruments that can be deployed to secure enduring conservation results at the project area (Low 2003).

The NE Draft Lexicon separate *capacity* into 2 questions – internal and external and ranked each as 3 (*all capacity to perform is in place*), 2 (*some, but inadequate*), and 1 (*no capacity*). TNC (Low 2003) ranks *leadership and support & legal framework* on a scale of *very high*, *high*, *medium*, and *low*.

#### Immediacy

The NE Draft Lexicon defined *Immediacy* as when something is important or urgent because it relates to a situation that is happening now. Similarly, the Georgia WAP (2005) used the terms *timeliness* or *urgency* as the conservation action that addresses a problem that is particularly urgent. If this specific action is not implemented or continued in the next ten years, the state will experience a significant loss of biological diversity or habitat quality. No other sources in the literature search produced the term *Immediacy* or an analogous term.

The NE Draft Lexicon ranked *Immediacy* at 3 (*now*), 2 (*near term*), and 1 (*long term*).

#### Sequencing

The NE Draft Lexicon defined *Sequencing* as an action that is one of several that must be done in some order. In the Florida WAP (2005) *Sequencing* was not included, but mentioned as an important conservation action to consider. In the Georgia WAP (2005) *connections with other conservation actions* serves as a critical component that enables or facilitates one to several other important conservation measures. Without this component, other efforts will be crippled or made ineffectual. TNC (2003) offered a *strategic approach* term. No other literature sources from this search yielded terms analogous to “sequencing.”

The NE Draft Lexicon ranks *Sequencing* as 1 (*step 3 or more*), 2 (*step 2*), 3 (*first step of 2 or more*), or 4 only step in sequence and will add a factor of dependency of *yes/no*.

#### Support for Action

In the NE Draft Lexicon *Support for Action* was defined as social/political/landowner ability to approve of an action and help it to be successful. TNC (2006) suggested the *presence of support in key agencies/partners* and

*stakeholder support/opportunity* as well *community & constituency support* (TNC (Low 2003)) as conservation action assessment terms similar to *Support for Action*. NC WAP (2005) and Georgia WAP (2005) offer *partnerships/opportunity* and *building public support*, respectively, as similar conservation assessment terms. Davis et al. 2003 also contributed the *flexibility* (engaging stakeholders).

The NE Draft Lexicon ranks *Support for Action* as 1 (*no support*) to 3 or 5 (*very high support*).

TNC (2006) ranked *presence of support in key agencies/partners* and *policy and constituency (stakeholder) support* on an ordinal scale (*low, medium, high, or very high*) for assessing relative conservation opportunities. Both *presence of key agencies/partners* and *policy and constituency (stakeholder) support* were weighted by 1.5. Similarly, TNC (Low 2003) ranked *community & constituency support* as *very high, high, medium, and low*.

### Duration

*Duration* is another term that the NE Draft Lexicon intends to include. In both TNC (2006) and TNC (Low 2003) *Duration* was included as a subheading under *benefits* and subsequently placed in the similar column as *Effectiveness* for the NE Draft Lexicon Terminology). However, it could also be included as a stand-alone term as well. TNC (Higgins et al. 2007) includes the term *tenure* defined as the duration of the commitment to the protection and/or management activities. *Tenure* is measured by *very good* (permanent) (or in perpetuity), *good* (long-term commitment) (25 years or greater), *fair* (short-term commitment) (less than 25 years) commitment, or *poor* (no Commitment).

**\*\*Internal note:** It is unclear whether NE Lexicon wanted “duration” to reflect the time commitment required (i.e., the need for sustained action over time vs. short term action). The TNC use seems to be about the likelihood of a sustained duration i.e., the time commitment available. NE will need to be clear on this and draw the comparison based on what we determine.

### Cost Estimate

The NE Draft Lexicon defines *Cost Estimate* as the approximation of the cost of a program, project, or operation. The *Cost Estimate* is the product of the cost estimating process. The *Cost Estimate* has a single total value and may have identifiable component values. A few of the literature sources provided *cost* as a conservation action assessment consideration. TNC (2007) further broke down *cost* as *one time cost, annual costs, staff time, and number of years*. TNC (Low 2003) defined *cost* as *cost in discretionary dollars* – estimate the total cost of implementing the Strategic Action, including staff time, in unrestricted or discretionary dollars that are available to the project. The Florida WAP (2005) defines *cost* as the order of magnitude in dollars with the total cost of implementing the action estimated for the time horizon of the action, but no longer than 10 years.

**\*\*Internal note:** NE will need to be clear about how we want this term applied, annual costs? Total costs? For duration? For no more than 10 years?

TNC (Low 2003) ranked *cost* as *very high* (total cost is \$1,000,000 or more), *high* (total cost is \$100,000 or more), *medium* (total cost is \$10,000 or more), and *low* (total cost is less than \$10,000).

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### **Identification of SGCN**

Most SWAPs refer to the National and State Rank criteria as the develop SGCN list in addition to other lists from Birds of Conservation Concern or Other approved or peer reviewed regional plans and systems including (Partners in Flight, Bird Conservation Regions, U.S. Fish and Wildlife Service, American Fisheries Society etc.). Further details regarding the definitions of the scoring/ranking criteria are included in Appendix C.

This literature search included the Arizona SWAP, which did not base their selection of SGCN on such criteria. Arizona SWAP notes “This vulnerability assessment did not use available national or global vulnerability rankings (e.g., NatureServe) because rankings based on species evaluations across their entire geographical distribution are too coarsely scaled. Also no attempt to match rankings done previously by the Department (e.g., Wildlife of Special Concern in Arizona, or rankings done by other agencies or entities, e.g., U.S. Forest Service Southwestern Region Sensitive Animals list , Bureau of Land Management sensitive species list for Arizona, Birds of Conservation Concern 2008, Southwest Partners in Amphibian and Reptile Conservation (PARC) again because of issues of scale, as well as differing management and conservation priorities across agencies, NGOs, etc. It is important to note that lists compiled by other entities are based on other, perhaps similar or dissimilar, criteria in different geographic and management settings, therefore the resulting vulnerability ranks herein are not meant to replace, update or invalidate any of those lists.”

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#### **Abundance and Trends of SGCN**

Florida WAP (2005) and Mississippi WAP (2005) used similar categories for describing species trends: *Declining*, *Stable*, and *Increasing*. Florida WAP (2005) also adds the *Unknown Category*. Mississippi assigned each category a point value for species abundance and trends. For example for measuring species: 4 points - *Species endemic to State*, 3 points – *State encompasses >25% of the species’ range*, 2 points - *State encompasses 5-25% of the species’ range*, and 1 point - *State encompasses < 5% of the species’ range*. NatureServe (2012) divides trends into long-term and short-term and further categorized them by letter and corresponding percentage value. Further details regarding abundance and trend of SGCN are included in Appendix D.

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#### **Habitat Conditions for SGCN**

EPA (2012) used a letter scoring system (A-D) of assessment of wetland ecosystem condition. For example an A category would correspond with highest quality habitat - the landscape context contains largely natural habitats that are minimally fragmented with few stressors; the size is large or above the minimum dynamic area, the vegetation structure and composition, soils, and hydrology are functioning within natural ranges of variation; invasives and exotics (non-natives) are present in only minor amounts, or have or minor negative impact; and many key plant and animal indicators are present. When evaluating terrestrial habitat, the Arkansas WAP (2006) used the categories *poor level*, *fair level*, *good level*, and *very good level* and weighted a range of measurements to assess the relative health of associated key factors, which in turn reflect the integrity of the associated habitat. Georgia WAP (2005) acknowledged that data on abundance and condition of habitats are not sufficient to assign quantitative scores or values for most habitat types. Further details regarding assessing habitat condition of SGCN are included in Appendix E.

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## APPENDIX B: SURVEY QUESTIONS AND RESULTS

### Q1 Has your agency started the 2015 revision of your state's Wildlife Action Plan?

Answered: 15 Skipped: 0

Answer Choices	Responses	
Yes	80%	12
No	20%	3
Total Respondents: 15		

### Q2 Please indicate which state, jurisdiction, or organization this survey represents.

Answered: 13 Skipped: 2

Answer Choices	Responses	
Maine	7.69%	1
New Hampshire	7.69%	1
Vermont	7.69%	1
Massachusetts	15.38%	2
Rhode Island	7.69%	1
Connecticut	7.69%	1
New York	0%	0
New Jersey	7.69%	1
Pennsylvania	23.08%	3
Delaware	7.69%	1
Maryland	0%	0
West Virginia	0%	0
Virginia	7.69%	1
District of Columbia	0%	0
Other	0%	0
Total		13

#	Name/Organization	Date
1	Maine Dept. of Inland Fisheries and Wildlife	3/12/2013 10:38 AM
2	CT kt	3/10/2013 9:30 AM
3	RI kt	3/10/2013 9:15 AM
4	Pennsylvania Game Commission (birds and mammals only)	3/8/2013 6:33 PM
5	Fish and Game	3/8/2013 5:07 PM
6	Delaware Division of Fish and Wildlife	3/8/2013 2:18 PM
7	Game Commission	3/8/2013 11:54 AM
8	Vermont Fish & Wildlife Department	3/7/2013 3:38 PM
9	Div. of Fish and Wildlife -- Endangered and Nongame Species Program	3/7/2013 12:43 PM
10	Division of Fisheries and Wildlife	3/6/2013 7:43 AM

**Q3 Is your agency planning to use any of the systems below to justify your Species of Greatest Conservation Need (SGCN) list? Check all that apply.**

Answered: 14 Skipped: 1

Answer Choices	Responses
Federal T & E	92.86% 13
State T & E	100% 14
Federal Heritage rank	71.43% 10
State Heritage rank	85.71% 12
IUCN	42.86% 6
BCRs	50% 7
<b>Total Respondents: 14</b>	

#	Other (please specify)	Date
1	1. State-listed "Species of Special Concern" & 2. High regional responsibility (NEPARC, regional declines among fish & BBS routes, etc.)	3/12/2013 10:45 AM
2	NEPARC, RSGCN etc	3/10/2013 9:31 AM
3	NEPARC, RSGCN etc	3/10/2013 9:15 AM
4	Northeast regional priority	3/8/2013 6:36 PM
5	Northeast Taxonomic Matrix Hockey Stick	3/8/2013 5:08 PM
6	AFS, NMFS, NEWDTIC	3/8/2013 2:23 PM
7	other recognized regional and/or national taxonomic group plans	3/7/2013 12:59 PM
8	We are developing a decision model with Cornell based on the above, plus others	3/5/2013 2:44 PM

**Q4 Information is often available to assess the distributions of species, even though it may vary widely in quality. With the exception of a certain groups, such as birds, there are little or no hard data about trends in abundance that could be used to select SGCN. What is your opinion about including in our common lexicon some qualitative terms to describe trends in abundance (check all that apply)?**

Answered: 14 Skipped: 1

	Strongly agree	Agree	Disagree	Strongly disagree	Total Respondent
We recommend NatureServe's population/status ranking terminology	30.77% 4	38.46% 5	30.77% 4	0% 0	13
Birds are the only group with legitimate abundance trend data	0% 0	28.57% 4	71.43% 10	0% 0	14
Birds are a good model of a lexicon for abundance	0% 0	61.54% 8	38.46% 5	0% 0	13
For all SGCN we should assign "stable, increasing, unknown"	15.38% 2	69.23% 9	7.69% 1	7.69% 1	13
For every population we should assign "stable, unknown"	0% 0	38.46% 5	38.46% 5	23.08% 3	13
Qualitative terms should NOT be used to describe abundance	7.69% 1	15.38% 2	61.54% 8	15.38% 2	13
Our common lexicon should NOT address abundance	7.69% 1	7.69% 1	61.54% 8	23.08% 3	13

#	Comment	Date
1	Even qualitative data can be useful when attempting to prioritize (generally inevitable!) an array of topics	3/12/2013 10:45 AM
2	we may not have enough data for populations or quantitative vs. qualitative	3/10/2013 9:15 AM
3	There are many ways to measure and state bird abundance	3/8/2013 6:36 PM
4	Assigning current status in a common lexicon would be appropriate but determining trends may become problematic particularly when trend data is often lacking or with such great uncertainty that it is unreliable.	3/8/2013 2:23 PM
5	birds are not under PFBC jurisdiction; defer to PGC. For population, it is often not known. If abundance is known, why not use it in the lexicon?	3/7/2013 4:56 PM
6	Our common lexicon should make it possible to say that we don't always know "the" answer. For a regional assessment we need information	3/7/2013 3:50 PM
7	For non-T&E species, it is rare for us to have enough detail to discuss population. Although we don't like to admit it, we use Qualitative measures constantly to justify actions. No reason not to include them within the SWAP.	3/7/2013 3:07 PM
8	There will be some difficulty in assigning status, but we should try to agree on an approach. For "populations" there will be issues of addressing what comprises a "population." Will we need to understand population status to assign status to species?	3/7/2013 12:59 PM

**Q5 Species distributions may be described using many different spatial units. Check all that apply to our common lexicon.**

Answered: 13 Skipped: 2

Answer Choices	Responses
State, county, or town boundary	84.62% 11
Management or planning districts	46.15% 6
Watersheds	76.92% 10
Habitat patches	69.23% 9
Population points	38.46% 5
<b>Total Respondents: 13</b>	

#	Other (please specify)	Date
1	Ecoregions would be our top choice for terrestrial species. Perhaps political units (state / county / township) could be summarized in tabular for geographic clarity but should not be the primary spatial units.	3/12/2013 10:58 AM
2	don't have enough data on the last 2	3/10/2013 9:33 AM
3	will be data driven	3/10/2013 9:18 AM
4	Unsure of the definition of a "population point".	3/7/2013 5:17 PM
5	Biophysical regions, eco-regions	3/7/2013 4:04 PM
6	We need geospatial units that are fine enough to be descriptive and coarse enough to buffer points and allow us to compensate for localized changes that are problematic with point locations. We don't want to redraw the map every two weeks. Our habitat patches can change too rapidly.	3/7/2013 3:15 PM
7	not exactly sure what is meant by "population points"	3/7/2013 1:14 PM
8	Poorly written question	3/5/2013 2:47 PM
9	Ecoregion	3/5/2013 11:39 AM

**Q6 Each SWAP is supposed to consider the distribution and abundance of all “major groups” of species (taxonomic groups or guilds) when selecting SGCN. Such data are tracked for some species by Natural Heritage programs, but in many cases, SGCN are not tracked by any formal program. For our common lexicon, which terms do we need to define in order to describe the data that are available for SGCN distribution?**

Answered: 13 Skipped: 2

Answer Choices	Responses
We do NOT need to describe distribution data	0% 0
Data source	76.92% 10
Scale	76.92% 10
Resolution	76.92% 10
Precision	61.54% 8
Age	76.92% 10
Quality	76.92% 10
Type	76.92% 10
Contact	69.23% 9
Link	46.15% 6
Sensitivity	84.62% 11
<b>Total Respondents: 13</b>	

#	Other (please specify)	Date
1	We generally screen out imprecise occurrences = not a factor if that is generally true? Species with data sensitivity issues merit some general discussion.	3/12/2013 10:58 AM
2	is link connectivity or web link?	3/10/2013 9:18 AM
3	Does "age"=date of a record? What is "link"? Does "quality" refer quality of location or species identification? A "confidence" field is needed.	3/7/2013 4:04 PM
4	I checked everything, but I am not sure what this question is asking. Do we need to define these terms or are we determining if these are fields that need to be included in some metadata structure? Or am I misunderstanding? The system won't let me leave this blank.	3/7/2013 3:15 PM
5	While it would be ideal to have this information for species not "tracked" by NHP's, the degree to which we will be able to provide such information will be very inconsistent.	3/7/2013 1:14 PM
6	Huh?	3/5/2013 2:47 PM

**Q7 Many different types of data are available to represent distributions of SGCN. Please select all that you believe should be described in our common lexicon.**

Answered: 13 Skipped: 2

Answer Choices	Responses	
Element Occurrence	92.31%	12
Source Feature	69.23%	9
Presence/absence points	61.54%	8
Habitat classes	76.92%	10
Habitat patches	69.23%	9
Habitat suitability model	30.77%	4
Niche model	7.69%	1
Habitat capability model	23.08%	3
Buffer	30.77%	4
<b>Total Respondents: 13</b>		

#	Other (please specify)	Date
1	Migration / connectivity corridors are sometimes a key data type. Observation points can be tracked in our "faunal heritage database" to promote evaluations of species status, but we usually subset a more refined type of data for flagging via environmental review or triggering management activity. Modeling is generally not an acceptable alternative.	3/12/2013 10:58 AM
2	not sure any of the last 5 are available in many states but should be included if possible	3/10/2013 9:33 AM
3	the latter 5 are likely not to be available	3/10/2013 9:18 AM
4	Confusing. We assume "class" refers to habitat type and "patch" to the habitat where a species is found.	3/7/2013 4:04 PM
5	I checked everything but I don't understand what this question is asking me. What will it mean if I check a box? The system won't let me leave this blank.	3/7/2013 3:15 PM
6	For those that we did not agree should be described, we would agree that they could be included if all we are doing is indicating their availability or providing a link or reference.	3/7/2013 1:14 PM

**Q8 For each SGCN, we need to identify habitat associations. Do you accept a crosswalk to the Northeast Terrestrial and Aquatic Habitat Classifications as a common standard for describing SGCN habitats?**

Answered: 13 Skipped: 2

Answer Choices	Responses	
Yes	69.23%	9
No	0%	0
Don't know	30.77%	4
<b>Total Respondents: 13</b>		

#	Comment required if answer is no.	Date
1	but we will use our more specific system as well	3/10/2013 9:34 AM
2	but we will use our more specific system as well	3/10/2013 9:20 AM
3	Depends upon how the crosswalks will be applied. Both classifications are great, but uncertain of the useable scale for resource managers.	3/7/2013 5:28 PM
4	VT uses natural community classification which dovetails w/ this model but natural communities is at a finer scale.	3/7/2013 4:05 PM
5	We need to determine if these classifications actually facilitate better management. Other states have abandoned similarly complex models because staff couldn't apply them. They adopted more basics systems like the National Landcover Dataset. On a separate note, we often don't know enough about our SGCN to talk intelligently about their habitat tolerances.	3/7/2013 3:19 PM
6	Caveat -- there still needs to be significant work done to QA/QC both habitat classifications and their applications (mapping) and the crosswalk. We have less concern with the classification approach than we do with the actual data layers (mapping)	3/7/2013 1:25 PM
7	Still doesn't exist for aquatic	3/5/2013 2:49 PM



**Q9 The RCN program funded habitat classifications, habitat mapping, and the "Geospatial Condition Analysis", which will provide relative indices of condition for each class of habitat. The indices will be based on available spatial data, such as conservation status, resiliency, road density, patch size, etc. The scores can be applied at any relative scale, such as the whole region or within states, answering such questions as where is the highest ranked patch of pine barrens in New Jersey? In summary, this project will define and estimate specific parameters to describe the relative condition of each habitat class, in each state, and across states. Do you agree that this approach will satisfy our needs with regard to a common lexicon for habitat condition?**

Answered: 13 Skipped: 2

Answer Choices	Responses
Yes	30.77% 4
No	0% 0
Don't know	69.23% 9
<b>Total Respondents: 13</b>	

#	Comment required if answer is no.	Date
1	Maine needs more info on "geospatial condition analysis" Of course, our small patches of pine barrens are inconsequential relative to those in NJ, but jurisdictions attempting to conserve species at risk near range limits can't always cope with such comparisons!	3/12/2013 11:02 AM
2	its a good start	3/10/2013 9:34 AM
3	its a good start	3/10/2013 9:20 AM
4	Unclear about the scope of this question	3/7/2013 5:28 PM
5	We are not willing to adopt these systems until we have determined their accuracy. If the habitat map does not accurately represent "on the ground" conditions, we won't use it to make important planning decisions.	3/7/2013 3:19 PM
6	It will be the only game in town across a regional scale, so yes. Would like the capability to include other more local approaches that exist now or in the future.	3/7/2013 1:25 PM

**Q10 Both NEPARC and NEFWDTC have adopted an approach to select Species of Greatest Conservation Need (SGCN) using conservation need and responsibility as screening factors. In this approach, need was measured by the proportion of Northeast states identifying a species as an SGCN, and responsibility was measured by the proportion of a species distribution occurring in the Northeast. Is your agency willing to work toward developing a similar common practice to select SGCN?**

Answered: 13   Skipped: 2

Answer Choices	Responses	
Yes	69.23%	9
No	30.77%	4
<b>Total</b>	<b>13</b>	

**Q11 Above, the distribution-based "responsibility" factor is fairly objective to measure, however "conservation need" is very inconsistently defined across organizations. Which of the following terms would you be willing to accept as common descriptors of the overall "conservation need" for a species, considering the cumulative effect of all the threats that impact a species (check ALL that apply):**

Answered: 13 Skipped: 2

Answer Choices	Responses	
Immediacy [needs conservation now vs. later]	92.31%	12
Certainty [need is nearly certain vs. uncertain]	92.31%	12
Extent [current impacts are sustainable vs. not sustainable]	76.92%	10
Reversible [impacts may be reversed vs. irreversible]	92.31%	12
<b>Total Respondents: 13</b>		

#	Other (please specify)	Date
1	Regional endemics (and especially state endemics) may not be getting sufficient priority & are often among the most vulnerable in diversity programs.	3/12/2013 11:09 AM
2	might be others	3/10/2013 9:34 AM
3	we may not be able to determine this for all species	3/10/2013 9:23 AM
4	Concepts (i.e., phrases) are good, but terminology needs to be adjusted. Example: Extent is a geographic term-use Sustainable. Response to 12: Nice try-we want to comment anyway. Categories should provide a gradient of responses	3/7/2013 5:46 PM
5	How does one apply "immediacy" if Action Plans/SWG are supposed to prevent species from becoming endangered	3/7/2013 4:08 PM
6	These terms haven't been explained well enough for me to make an informed decision about what criteria should or should not be considered. The system wouldn't let me leave them all blank, so I checked them all, instead.	3/7/2013 3:29 PM
7	If these terms or similar were used to determine conservation need as opposed to using the NEPARC approach, we would be more comfortable with our 'yes' to 10 above.	3/7/2013 1:44 PM

**Q12 Please read the choices above again, and notice each term can be represented by an "either / or" type of category, such as now/later, certain/uncertain. Do you agree that using only 2 or 3 simple categories is a useful approach to achieve consistent assessments of species conservation needs across organizations?**

Answered: 13 Skipped: 2

Answer Choices	Responses	
yes	61.54%	8
no	46.15%	6
Total Respondents: 13		

**Q13 The questions above describe the use of several categorical factors to summarize the overall conservation need (or degree of threat) as a tool to help select SGCN. Once SGCN are selected, a similar approach could be used to go one step further and assess several categorical factors for each specific threat that is impacting "species x". Do you agree that our common lexicon should include terminology to define categorical factors to assess specific threats, species by species?**

Answered: 13 Skipped: 2

Answer Choices	Responses	
yes	84.62%	11
no	15.38%	2
Total Respondents: 13		

**Q14 What terms do we need to use to adequately describe key attributes of threats? Check ALL that apply.**

Answered: 13 Skipped: 2

Answer Choices	Responses	
Human factors	69.23%	9
Environmental factors	76.92%	10
Biological stress	61.54%	8
Scale	84.62%	11
Extent	84.62%	11
Immediacy	92.31%	12
Reversibility	92.31%	12
<b>Total Respondents: 13</b>		

#	Other (please specify)	Date
1	Duration (acute / chronic). Even scale, extent & reversibility may be useful attributes but not if this planning is not dynamic or feedback via adaptive management is constrained.	3/12/2013 11:09 AM
2	there might be others but not enough time to do here	3/10/2013 9:23 AM
3	Couldn't Biological Stress be an attribute of Human or Environmental factors. Do you mean Biological Factors such as genetic or interspecific competition?	3/7/2013 5:46 PM
4	Use Salafsky et. al. Taxonomy of Direct Threats	3/7/2013 4:08 PM
5	Category, scope, severity	3/7/2013 3:29 PM
6	As a comment to this question and 13 above, we agree that the inclusion of such terminology would be useful, but we may not be in a position to apply it now or in the near future.	3/7/2013 1:44 PM

**Q15** In planning, some refer to a natural resource as an "element" or a "target;" others refer to planning processes as "elements", and still others call the desired outcome of implementing planned actions "targets". Is your agency willing to work toward a series of common terms (such as resource, goal, objective, desired outcome, indicator, level) that can be used to connect natural resources to actions and measurable outcomes, so that performance can be tracked logically as progress toward specific results that contribute to larger goals?

Answered: 13   Skipped: 2

Answer Choices	Responses	
Yes	84.62%	11
No	15.38%	2
<b>Total</b>	<b>13</b>	

**Q16 Tell us what you think of the following as sequence of terms to link resources to actions to results: Resource; Goal; Objective; Desired outcome; Indicator; Level. Is each term as useful part of the sequence as a whole?**

Answered: 13 Skipped: 2

	Useful	Not useful	I do not understand this term	Total
Resource	8 61.54%	0 0%	5 38.46%	13
Goal	12 92.31%	0 0%	1 7.69%	13
Objective	12 92.31%	0 0%	1 7.69%	13
Desired outcome	13 100%	0 0%	0 0%	13
Indicator	12 92.31%	0 0%	1 7.69%	13
Level	5 38.46%	2 15.38%	6 46.15%	13

#	Other (please specify)	Date
1	Goal & desired outcome could be fairly similar, unless one factors more realism! "Level" is too vague without clarification.	3/12/2013 11:20 AM
2	clarify level?	3/10/2013 9:36 AM
3	not sure what level means here	3/10/2013 9:27 AM
4	Should consider defining "indicator", "resource" & "resource". What about "measures" as in "performance measures" that we are required to use as part of Wildlife TRACS.	3/7/2013 6:09 PM
5	Strategies (a way to achieve an objective) and actions (the steps to implementing a strategy)? Would that be too fine-scaled?	3/7/2013 4:12 PM
6	these terms will be useful as the definitions we apply to them and the clarity/distinctions among them.	3/7/2013 2:37 PM

**Q17 Do you agree the following terms are useful to describe an adaptive management framework for actions? Check ALL that apply.**

Answered: 13 Skipped: 2

	Strongly agree	Agree	Disagree	Strongly disagree	Total
Performance indicator	23.08% 3	61.54% 8	15.38% 2	0% 0	13
Start	7.69% 1	61.54% 8	30.77% 4	0% 0	13
Duration	15.38% 2	61.54% 8	23.08% 3	0% 0	13
Evaluation cycle	23.08% 3	53.85% 7	23.08% 3	0% 0	13
Data management capacity	0% 0	54.55% 6	45.45% 5	0% 0	11

#	Other (please specify)	Date
1	"Effectiveness" was cited by some staff but may overlap with performance indicator?	3/12/2013 11:20 AM
2	not sure what data capacity means	3/10/2013 9:36 AM
3	please clarify data mgmt capacity	3/10/2013 9:27 AM
4	It's difficult to agree or disagree without definition of the terms.	3/7/2013 6:09 PM
5	Such terms should align with Wildlife TRACS adaptive mgmt module (if there is one).	3/7/2013 4:12 PM
6	I don't understand the term "Data management capacity" so I clicked "Disagree"	3/7/2013 3:37 PM
7	In the context of SWAPs and the level of action detail and specificity that needs to be in SWAPs, most of these terms go "too far." They are useful for adaptive management of projects, but SWAPs are not meant to be project plans.	3/7/2013 2:37 PM



**Q18 In SWAPs, actions are supposed to be linked to specific threats. However, that relationship is not always direct or obvious. Yet, in order to prescribe the right kind of action, specific attributes of the threats addressed need to be identified. Are the following terms useful to help describe how a particular action might be related to or address certain threats? Rate each one.**

Answered: 13 Skipped:

	Useful	Not useful	Total
Threat addressed by action	84.62% 11	15.38% 2	13
Human factors addressed by action	83.33% 10	16.67% 2	12
Environmental factors addressed by action	83.33% 10	16.67% 2	12
Biological stresses addressed by action	83.33% 10	16.67% 2	12
Expected direct benefits	84.62% 11	15.38% 2	13
Expected indirect benefits	75% 9	25% 3	12
Expected change in resource status	69.23% 9	30.77% 4	13

#	Other (please specify)	Date
1	All seem reasonable concepts. An implementation phase might better reveal which are more useful than others.	3/12/2013 11:20 AM
2	If we are talking about wildlife, we should really stick to wildlife rather than a calling it a resource.	3/8/2013 5:18 PM
3	Not sure what this is trying to address.	3/7/2013 6:09 PM
4	These sound good but we don't know if all are needed or if these are comprehensive.	3/7/2013 4:12 PM
5	Change in threat status/level.	3/7/2013 2:37 PM

**Q19 Many organizations use the S.M.A.R.T. system to ensure that goals are developed with enough detail to make implementation possible. If you are not familiar this concept, please google it. Do you agree that the common lexicon should use a similar model, including who, what, where, when etc. to describe actions?**

Answered: 13 Skipped: 2

Answer Choices	Responses	
Yes	84.62%	11
No	15.38%	2
Total Respondents: 13		

**Q20 Do you agree it is valuable to have a common way to describe the feasibility and efficacy of proposed conservation actions?**

Answered: 13 Skipped: 2

Answer Choices	Responses	
yes	84.62%	11
no	15.38%	2
Total	13	

**Q21 Is your agency willing to work toward a common approach to prioritizing actions, where factors such as the urgency of the threat addressed are considered in conjunction with the feasibility, cost and efficacy of the proposed action?**

Answered: 13 Skipped: 2

Answer Choices	Responses	
Yes	76.92%	10
No	23.08%	3
Total	13	

**Q22 Do you agree the following terms are useful to categorize actions for prioritization? Check ALL that apply.**

Answered: 13 Skipped: 2

	Stongly agree	Agree	Disagree	Strongly disagree	Total
Expected effectiveness	30.77% 4	61.54% 8	7.69% 1	0% 0	13
Cost estimate	7.69% 1	76.92% 10	15.38% 2	0% 0	13
Funding availability	7.69% 1	61.54% 8	30.77% 4	0% 0	13
Implementer availability	0% 0	69.23% 9	30.77% 4	0% 0	13
Start date	7.69% 1	46.15% 6	46.15% 6	0% 0	13

**Q23 Species distributions, habitat conditions, threats and actions may all be related spatially. The "eight required elements" for SWAPs refer to spatially explicit actions. For example, an action or threat could apply to one, many, or all patches of a habitat type, or only those in a certain town. Which spatial units do we need to accommodate in our lexicon in order to describe the location actions are intended to be implemented? Check all that apply, recognizing that some may be used in combination.**

Answered: 13 Skipped: 2

Answer Choices	Responses	
State, county, or town boundary	92.31%	12
Management or planning districts or conservation zones	61.54%	8
Watersheds	61.54%	8
Habitat classes	46.15%	6
Habitat patches	53.85%	7
Population points	30.77%	4
<b>Total Respondents: 13</b>		

#	Other (please specify)	Date
1	Ecoregions for terrestrial species & watersheds for aquatic/ riparian species seem preferable as overall spatial units. Political units or management / planning / conservation districts are secondary-scale units at best.	3/12/2013 11:20 AM
2	last 2 if possible but likely not to have enough data	3/10/2013 9:36 AM
3	don't think we'll have the last 2 for many species or habitats	3/10/2013 9:27 AM
4	Implementation happens at a finer scale (e.g., site) which is not represented by these categories. For Questions 19-21: seem bias to obtain a "yes".	3/7/2013 6:09 PM
5	ecoregions	3/5/2013 12:01 PM

**Q24 Identifying data gaps and uncertainties is a requirement throughout SWAPs, for the purpose of framing the adaptive management process. Is your agency willing to adopt some common ways to describe uncertainties, so they can be consistently addressed by monitoring, performance tracking, and/or research in an adaptive management context?**

Answered: 12 Skipped: 3

Answer Choices	Responses	
Yes	91.67%	11
No	8.33%	1
<b>Total</b>	<b>12</b>	

**Q25 Identifying data gaps and uncertainties applies to multiple SWAP elements: species/habitat distribution, status, and condition, and also threats and actions. Therefore, our common lexicon needs to accommodate a means to identify uncertainties and corresponding monitoring or research for each SWAP element. Are the following terms sufficient to describe different general TYPES of uncertainty that might be identified across all SWAP elements, even though some of the suggested types may not apply to all SWAP elements?**

Answered: 12 Skipped: 3

	Agree	Disagree	Don't know	Total
Uncertainty of Causality	75% 9	0% 0	25% 3	12
Uncertainty of Effectiveness	83.33% 10	0% 0	16.67% 2	12
Uncertainty of Status	83.33% 10	8.33% 1	8.33% 1	12
Uncertainty of Measurement	58.33% 7	8.33% 1	33.33% 4	12
Information Gap	81.82% 9	9.09% 1	9.09% 1	11

#	Other (please specify)	Date
1	A variety of limiting factors could be influential over time & space: presumably these could overlap with "uncertainty of causality" and "information gap" but they are not a clear fit within the above matrix.	3/12/2013 11:35 AM
2	These need to be defined.	3/7/2013 6:21 PM
3	Information gap seems like a driver of 1-4	3/5/2013 12:05 PM

**Q26 Which general categories of monitoring and research does the lexicon need to accommodate? Check all that apply.**

Answered: 12 Skipped: 3

	yes	no	Total
It is not necessary for the lexicon to categorize monitoring and research actions	2 18.18%	9 81.82%	11
Threat Detection	8 72.73%	3 27.27%	11
Change in Threat Status	9 81.82%	2 18.18%	11
Presence/Absence Surveys for SGCN Distribution	11 100%	0 0%	11
Relative Abundance/Density	10 90.91%	1 9.09%	11
Reproduction/Demography	10 90.91%	1 9.09%	11
Detect Habitat Change	10 90.91%	1 9.09%	11
Survey Habitat Quality	10 90.91%	1 9.09%	11
Genetics	10 90.91%	1 9.09%	11
Detect Contaminants/Pollution/Air & Water Quality	9 81.82%	2 18.18%	11

#	Please list others.	Date
1	Most of these could be a need given the array of taxa under consideration, but they should be not addressed routinely for all SGCN species in the Northeast. Is this necessary or useful in regional coordination, or is it implicit that some flexibility is needed here amongst participants? For instance, "relative abundance / density" & "survey habitat quality" might sufficient in core range within the region, but other categories could be crucial at periphery of range. I can see some standardization for basic presence / absence surveys on SGCN species, but other topics are uncertain in general.	3/12/2013 11:35 AM
2	last one is one threat	3/10/2013 9:37 AM
3	the last one is a specific threat so why separate it out	3/10/2013 9:29 AM
4	determine the habitat requirements of a species; determine life history of a species; identify locations of habitat	3/7/2013 4:17 PM
5	Threat detection should include threat characterization. Not sure which of these would cover/include disease monitoring.	3/7/2013 2:57 PM
6	gack	3/5/2013 3:05 PM

## Q27 Does TRACKS provide sufficient guidance toward a SWAP lexicon for tracking the performance of implemented SWAP actions?

Answered: 12 Skipped: 3

Answer Choices	Responses	
Yes	16.67%	2
No	8.33%	1
Don't know	75%	9
<b>Total</b>	<b>12</b>	

## Q28 In addition to the TYPES of uncertainty described above, do you agree the following terms are useful to DESCRIBE the significance of a particular area of uncertainty?

Answered: 12 Skipped: 3

	Agree	Disagree	Don't know	Total
Categorize Level of Uncertainty	66.67% 8	0% 0	33.33% 4	12
Categorize Feasibility of Reducing Uncertainty	25% 3	8.33% 1	66.67% 8	12
Categorize Risk of Consequence	41.67% 5	8.33% 1	50% 6	12

#	Other (please specify)	Date
1	Need clarification to comment. What's the "risk of consequence of uncertainty"? Are we relying on worst-case scenarios or other forecast projections?	3/12/2013 11:35 AM
2	We need more info before we can answer uncertainty questions	3/7/2013 4:17 PM
3	I'm uncertain	3/5/2013 12:05 PM

**Q29 Are you willing to adopt a common standard for documenting the literature cited in SWAPs?**

Answered: 12 Skipped: 3

Answer Choices	Responses	
Yes	91.67%	11
No	8.33%	1
<b>Total</b>	<b>12</b>	

#	Suggested citation standard	Date
1	Journal of Wildlife Management	3/8/2013 6:41 PM

**Q30 Is your agency willing to adopt a standard method to document search terms, keywords, and other metadata to describe sources of information for the Northeast?**

Answered: 12 Skipped: 3

Answer Choices	Responses	
Yes	91.67%	11
No	8.33%	1
<b>Total</b>	<b>12</b>	



## APPENDIX C: EXAMPLES OF COMMITTEE CHARTER AND OUTREACH STRATEGY

### Example Committee Charter

#### **Pennsylvania Wildlife Action Plan** *Revising the PA WAP (2015)*

##### **Advisory Committee: Roles and Responsibilities**

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**Background:** In September 2005, the Pennsylvania Game Commission (PGC) and Pennsylvania Fish & Boat Commission (PFBC) submitted the first Pennsylvania Wildlife Action Plan (PA WAP). With a Wildlife Action Plan submitted by each state and U.S. Territories, this congressionally mandated document maintained the eligibility of Pennsylvania for receipt of State Wildlife Grant (SWG) funding. After rigorous regional and national review, the U.S. Fish & Wildlife Service (FWS) approved the Pennsylvania WAP in 2006.

To maintain eligibility for ongoing SWG funds, Congress also required regular updates of the WAP by each state/territory, at an interval not to exceed 10 years. The next version of the PA WAP is due to the FWS no later than 30 September, 2015. Considering the extensive volume and scope of this document, the PGC and PFBC have initiated the process for revising the PA WAP.

As part of this revision process, the PGC and PFBC are requesting advice and recommendations from partners who were involved in the development of the first PA WAP or who may have a critical role in the implementation of the current plan or the revised plan (PA WAP 2015). In addition, consultation with federal, state and tribal agencies, as well as partners and the public, are required as part of the Wildlife Action Plan revision process (Elements 7 & 8). Therefore, this Advisory Committee (hereafter Committee) can further assist in addressing this requirement.

For efficiency and effectiveness, we have identified the following Roles and Responsibilities as well as Operational Guidance for participants of this Committee. We are genuinely seeking your candid and constructive advice in the revision of the PA WAP.

#### **Roles & Responsibilities**

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**1. Advisory:**

- a. This committee will function in an advisory role only.
- b. PGC and PFBC reserve the right to use, modify or to limit use of any recommendations or materials provided by the Committee.

**2. Participation:**

- a. Participation in the Committee is voluntary and members should not feel obligated to participate.

- b. To maintain a manageable committee size, participation is by invitation.
    - i. Additional members may be recommended, but their participation must be approved by both PFBC and PGC.
    - ii. Committee members may consult with other partners who may not be part of the Committee to gather pertinent information.
  - c. PGC and PFBC recognize that participants have obligations to their agency or organization. We will strive to minimize the time and inconvenience of participants.
  - d. Participation in this committee will not provide any advantage in securing current or future funding from State Wildlife Grants or other sources, provided by either the PGC or PFBC.
  - e. Participants will provide all professional courtesy to other members (see details in Operational Guidance below).
- 3. **Meetings:** The PGC and PFBC recognize that increasing travel expenses are impinging upon the budgets of state, federal and non-governmental organizations. Therefore:
  - a. In-person meetings will be kept to a minimum (estimated 2 per year).
  - b. Conferencing and web-ex will be used to foster communication between in-person meetings.
  - c. If technical teams/sub-committees are formed, the leaders of these groups will be responsible for coordinating technical team meetings and conference calls. PFBC and PGC will assist in facilitating these meetings/calls.
- 4. **Travel Expenses:**
  - a. Participants will be responsible for their own travel expenses, unless funding is available to offset travel costs.
- 5. **Tasks:**
  - a. Committee participants may be asked to develop new materials, provide existing materials, gather information or other necessary tasks, to assist with the revision process.
  - b. Copyrighted or restricted material must be acknowledged and thoroughly referenced.
  - c. Due dates for tasks will be developed through mutual consent by the participants.
- 6. **Acknowledgement:**
  - a. The conservation and protection of Pennsylvania's natural resources is a collaborative effort. PGC and PFBC are truly appreciative of the efforts and support from partners.
  - b. All participants will be gratefully acknowledged in the revised PA WAP.

## Operational Guidance

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**Overview:** This is a statewide effort with national significance and we recognize that participating members of this Committee will represent the interests of their respective agencies and organizations. We also respect that this project is *in addition to* each member's standard duties and responsibilities. The following operational guidance provides a foundation for the responsibilities of participants to ensure timely completion of the revised Wildlife Action Plan.

**Collegiality:** This project has a common goal (i.e., a completed, revised plan) and provides an opportunity to build camaraderie.

- Have fun!
- Make new acquaintances and build upon existing relationships.
- Share your knowledge and learn from others.

**Timelines:** Established timelines are to ensure timely completion of the project.

- Please abide by timelines for meetings, draft documents; conference calls, and related activities
- When participating (e.g., verbal or written ideas), please be mindful of time constraints. If a topic requires further discussion, propose an alternative venue.

**Mutual Respect & Trust:** A strength of this Committee is the diverse knowledge and experience of its members. Committee products will be based upon our collective contributions. Scientific discourse can be productive (and occasionally messy), so keep in mind the following guidance for participation:

- Respect all contributions & ideas.
- Critiques should be directed at the ideas not the person. The tone of such critiques should be constructive and not degrading, condescending, or inflammatory.
- Minimize non-subject discussions. Keep to the topic, unless absolutely necessary.
- Be considerate of distractions and avoid speaking while others are speaking -- wait until you are called upon or there is an appropriate time for providing your comment.
- Minimize “side bar” conversations.
- Encourage participation by all members.
- Avoid hidden agendas. Be open about potential conflicts of interests.
- Place cell phones on “manner mode” and if receiving a call, minimize disruption to the group.

**Shared Roles & Responsibilities:** The complexity and requirements of this project require shared roles and responsibilities. Participants will strive to share the tasks and responsibilities by:

- Volunteering for tasks, especially those for which they have special expertise or interests.
- Being proactive in providing information that can assist with filling data gaps and advancing ideas.
- Being responsible for keeping current on the status of the project, even if they are unable to participate in all meetings, conference calls, or similar discussions.

**Decision-Making:** It is unlikely we will all fully agree on all aspects of the various products. Further, as Advisory Committee members, information provided represents *recommendations* to the Commissions. The PGC and PFBC are responsible for the final Wildlife Action Plan. Therefore, the following guidance is provided for decision-making:

- Members present during specific meetings or conference calls are encouraged to participate fully in the decision-making process.
- Adapt a “will live with” decision-making format.
- Given the short project timelines, not all members will be present at each meeting or conference call. As decisions are made or conclusions reached, those not in attendance agree to move forward as a team and not retrace discussions or decisions causing unnecessary backtracks for the team as a whole.
- Be open-minded and creative. As differences in viewpoints arise, strive to actively listen to the other person’s views and rationale.

- Decisions not receiving “will live with” support will be provided to the PFBC and PGC for resolution. Explanations will be provided for any final decision.

## Example Public Input Plan

This plan identifies three types of stakeholders and sets general and specific communication goals for each.

	Audiences Targeted				#
	Tier 1 Stakeholders- TWW, DNR, Fed/sate partners Collaborators Goal: Consult and collaborate	Tier 2 Stakeholders- Interested but limited investment Goal: Inform and involve	Tier 3 General Public Goal- Inform		
Type of Promotion				Target Date	
Direct Mail/email Fact sheets/ program material	Email, (record dates)	Email, (record dates)		Quarterly (Same as website-see below)	
Direct mail/email Brochures/Flyers	Email, (record dates)	Email, (record dates)		Initial mailing , then distribute at meetings & presentations throughout 04-05	
Website- Updated quarterly Phase 1- Introductory material Phase 2- GCN species/habitat info Phase 3- Conservation Actions, Threats Phase 4- Conservation Actions Draft Phase 5- Draft Plan update Phase 6- final plan announcement	maps and threats to help ID Conservation Actions	X	X	<b>April-</b> Intro materials <b>July-</b> GCN info and solicit <b>October</b> Conservation actions - solicit input <b>Jan 05-</b> C Actions draft <b>April- June 05</b> Draft plan <b>September 05-</b> Final Plan	
Planning Committee meetings DNR/agency internal memos- Inreach TWW meetings/correspondence	X			Meeting- Every month monthly updates monthly emails minimum	
Newsletters- put in org newsletters	X	X		Quarterly to every 6 months	
Magazine articles- DNR or state conservation organizations	X	X	X	Quarterly to every 6 months	
Public relations: press releases	Quarterly X	X	X	Quarterly with website updates	
Workshop	June- GCN January- Conservation Actions X	X	X	2 for Tier 1 ,possible invite to Tier 2	
Exhibit /poster at Meetings	X	X		Every Possible state meeting; set up traveling exhibit	
DNR staff and TWW staff briefing/report at all meetings possible	Distribute brochures, and updates	Distribute brochures, and updates	Distribute brochures, and updates	All meetings possible Develop schedule and list	
Presentations to Tier 2 and 3 groups				As requested	

