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Terwilliger Consulting, Inc. for the Northeast Fish and Wildlife Diversity Technical Committee

Regional SWAP Database Framework (RCN 2014-3) Final Report

In support of State Fish and Wildlife Agencies identifying regional priorities through access to 14 Northeast State Wildlife Action Plan data

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# **Regional SWAP Database Framework**

# **(RCN 2014-3) Final Report**

In support of State Fish and Wildlife Agencies identifying regional priorities through access to 14 Northeast (NE) State Wildlife Action Plan (SWAP) data

# Objectives:

The objectives of this project were to:

* To compile key information from the 14 NE SWAPs in a streamlined database and provide state agencies (and their partners) with easy access to this information through simple queries and reports.
* To allow identification of region-wide patterns and priorities based on a compilation of data contained in the individual NE SWAPS, regarding key SWAP species, habitats, threats and actions.
* To enable states to work together on shared regional priorities identified in their SWAPS

# Outcomes:

Regional priority species, habitats, threats and actions have been identified from State SWAPS, and NEFWDTC begins its review and refinement of these results for action in the 2017 SWAP Roll Up. This database allows the NEFWDTC to identify the priority species, habitats, threats, and actions that were most commonly cited in NE SWAPS. States can then further prioritize and implement key regional actions to address key regional threats to complement and guide their state and local level efforts.

NEAFWA State Agency programs can query all NE SWAPS in one easily accessible database to find and compare regional priority species, habitat, threats and actions with those listed in their state. They can compare their SWAP priorities with neighboring states, and those with which they share common species and habitats, to develop informed, consistent efforts to address these common targets and threats most effectively.

States can work together on these identified priority actions and share them with partners for further implementation at both the state and regional levels. These results have already been used to inform the RCN program, the USFWS Endangered Species program, the NALCC ROCA effort, the NRCS focal species effort, the Chesapeake Bay Commission’s Habitat Implementation Committee, and other regional initiatives. Database reports and queries were used to inform collaborative efforts to work with partners on the key threats identified in SWAPs. The NE Climate Science Center was provided all the climate change data for the NE SWAPS, and the NE Wildlife Disease Cooperative Unit was provided the SWAP data on the specific disease threats listed in NE SWAPS.

# Deliverables:

Over the 2 year timeframe, 4 major products have been developed and delivered. The project began by developing a regional SWAP database framework with standard fields and definitions (lexicon). This enabled development of a full database template (NE SWAP template v 2.1) and a populated state example (DE WAP database), and ultimately a final condensed database version “datalite” that contains all NE SWAP data that were made available by states. Specifically:

### Delivered 2014-2015:

1. Common lexicon for SWAP and SWAP databases to provide consistent terms and regional consistency to allow for regional roll up
2. Regional database template (all fields for all elements) for states to use and populate
3. Survey to identify the most commonly asked questions/queries desired of the database (i.e. what are most frequently cited threats and actions to RSGCN in NE SWAPs)
4. Completed state database prototype
5. Survey results from State Wildlife Diversity Program Managers and SWAP Coordinators that identified most commonly asked questions desired of the database (i.e. what are most frequently cited threats and actions in NE SWAPs).
6. 4 individual state SWAP datasets were made available and were imported
7. No-cost extension until September 30, 2016, allowing states more time to provide the necessary data.

### Delivered 2016:

1. Newly designed, streamlined database with key fields for Elements 1-4
2. Standard forms for data input with examples and instructions
3. Survey results from State Wildlife Diversity Program Managers and SWAP Coordinators that identified which threat or action characteristics were most valuable in determining priorities. Additional questions were asked about their ability to review and update data in the database.
4. Immediate, additional assistance helping 7 states to convert/import incompatible or incomplete data to the regional database
5. Immediate development of customized state data entry interface and assistance to 7 states in exporting and populating the data forms to import into the database
6. Standard queries and reports of the most commonly asked questions /searches of the database.
7. Standard forms for data edits and verification by states with examples and instructions
8. Preliminary reports of the regional priority species, habitats, threats and actions from available data for state review by September 30
9. A completed, streamlined database will be populated with all key state SWAP data made available from the 14 NE SWAPS and delivered by June 30.

# Approach

## Steps in the Development and Evolution of the NE SWAP Database

1. A database planning framework was developed to identify the needs of states and how to address them
2. States were surveyed to assess their capacity to provide data and identify their needs and expectations for the database. Key queries and objectives were established.
3. Consensus was reached on the common needs and terms to be captured in the database
4. A Lexicon was developed so that consistent terms would be used for all entries in the database
5. A NE database template (Access database) was developed and provided to states for data entry. It was prepopulated with regional terms and lexicon fields, and only required state data entry
6. A fully populated database was provided (DE) to use/populate for consistent data/links
7. Interested contractors such as NatureServe, CMI/VA Tech, and NALCC were interviewed to determine concept and capacity for web-enabling or hosting of the database
8. An additional survey was developed to reassess each state’s capacity to provide data and their key needs (what they wanted out of the database in terms of most common queries). It became clear that states could not provide all the data requested due to limited capacity.
9. A new, streamlined database was developed with key SWAP fields for the 4 essential elements
10. Simplified forms were developed for states to enter data
11. States were assisted in their efforts to compatibly format and export their data
12. QA/QC protocols were developed for data entry, to ensure data consistency and more efficient clean up
13. States were sent a pilot version of the database for review and comment
14. States were sent their data to review, edit and verify
15. NEFWDTC members worked with their respective state database and SWAP staff to send their SWAP data in the requested format.
16. Preliminary and updated versions of results were provided to the NEFWDTC and their partners
17. Final results will inform the SWAP Roll Up report and 2017 review and refinement of regional priorities for RCN and other key partner programs.

## Northeast Regional SWAP Database Structure

The Northeast Region SWAP database is a relational database created using Microsoft Access. The purpose of the database is to capture, organize, analyze, and report on key components of state wildlife action plans in the Northeast Region. As originally conceived, the database was to be available for all states to use when developing their 2015 wildlife action plans. This would have ensured consistency and uniformity among the state databases and led to a relatively easy transition to a fully functional regional database.

A conceptual model of the database was developed in 2013 using the data framework as outlined in the Northeast Regional SWAP Lexicon (Crisfield and the Northeast Fish and Wildlife Diversity Technical Committee 2013). Variations of that database model were used in some states. Because the model had a detailed and complex data structure, its use was difficult and time consuming for non-database staff to use and populate. Some states chose to use their own databases while other states had no databases at all. Consequently, the migration of state wildlife action plan data to a common regional data structure was more complex and time consuming than anticipated.

In an effort to assist states in providing their SWAP data while still meeting the deadlines for these regional objectives, a simplified data structure for a regional database was designed. Several states without specific SWAP databases requested a more narrow data request with a limited number of key data fields. A Microsoft Excel file (NERegionalSWAPData.xls) with instructions (Appendix 1) was developed in response, and states were asked to submit their data throughout 2016.

There was significant variation in the states’ ability to do this, and not all states used the Excel file for submitting data. State data were thus delivered in a variety of formats and data structures (Table 1). As states submitted data, modifications and improvements were made to the database to accommodate the variety of techniques used by states for recording their wildlife action plan data. Additionally, unique key ID fields were created if they were not included with a state’s submitted data.

The database was designed to allow users to search for a species by taxa and to review its status in each state. Threats specific to that species and the habitats in which it is found can also be reviewed along with any proposed conservation actions. This gives state wildlife managers, their partners, and stakeholders a convenient method to share their Wildlife Action Plan data. This sharing of data, in turn, will lead to increased coordination of efforts to monitor species populations and address threats to those species and habitats.

In the fall of 2016, states were provided a copy of the database for review, trial use and comments. Instructions for data entry were also provided (See Appendix 1). Several states with more comprehensive databases provided positive feedback and use of the database (NY, ME, PA, NH). After all submitted data were standardized and consolidated in the regional database, a customized editable database was created for each state that had submitted the minimum required data. These customized state databases along with instructions were distributed in early October 2016, allowing states to review and edit their previously submitted data. This was an additional step designed to QA/QC the data. Several states completed this review and reported minor or no edits. States were also given the opportunity to provide additional data through this process, and to edit their own data using this tool. The edits were incorporated into the database, and the content and format were reviewed and checked again. Multiple reports were provided to states upon their request, allowing for an additional QA/QC of the data.

**Table 1. Description of state data submitted to the Northeast Region SWAP Database.**

| **State** | **Data Submitted** |
| --- | --- |
| **Connecticut** | **Data provided on MS Excel spreadsheets exported from Connecticut’s MS Access database. Threats and actions were considered statewide or assigned to habitats and major taxa groups.** **Threats and actions were not assigned to individual species.** |
| **Delaware** | **Data provided in a MS Access database (DE\_SWAP\_111315.accdb). Threats and actions were considered statewide or assigned to species, habitats, and major taxa groups.** |
| **D.C.** | **Data provided on MS Excel spreadsheets based on tables from D.C.’s wildlife action plan. Threats and actions were assigned to habitats. Threats and actions were not assigned to individual species.** |
| **Maine** | **Data provided in the MS Excel file NERegionalSWAPData.xls. Threats and actions were assigned to species, habitats, and major taxa groups.** |
| **Maryland** | **Data provided in the MS Excel file NERegionalSWAPData.xls. Threats and actions were assigned to species and major taxa groups.** |
| **Massachusetts** | **As of 12/21/16, incomplete data provided in the MS Excel file NERegionalSWAPData.xls. Threats were assigned to habitats. No actions were associated with the assigned habitat threats. Threats and actions were not assigned to individual species.** |
| **New Hampshire** | **Data provided in eight MS Access databases. Threats and actions were assigned to species and habitats.** |
| **New Jersey** | **As of 11/21/16 incomplete data provided in a MS Access database (NJSWAP\_092016\_forKaren.accdb). Threats were assigned to species and major taxa groups. However, no actions were assigned. Species/habitat relationships were only submitted for 107 of the 657 species.** |
| **New York** | **Data provided in a MS Access database (NYS\_SWAP\_Conservation\_Actions\_11\_25\_15.accdb). Threats and actions were assigned to species only.** |
| **Pennsylvania** | **Data provided in a MS Access database (SWAPDB\_\_03-30-2016.accdb). Threats and actions were assigned to species only.** |
| **Rhode Island** | **Data provided on MS Excel spreadsheets exported from Rhode Island’s MS Access database. Threats and actions were considered statewide or assigned to species, habitats and major taxa groups. Only one habitat was specified for each species.** |
| **Vermont** | **Data provided in the MS Excel file NERegionalSWAPData.xls. Threats and actions were assigned to species, habitats, and major taxa groups.** |
| **Virginia** | **Data provided in the MS Excel file NERegionalSWAPData.xls. Threats and actions were assigned to habitats and major taxa groups. Threats and actions were not assigned to individual species.** |
| **West Virginia** | **As of 11/21/16 incomplete data provided in a MS Access database (WVSWAPMASTER - 7-14-15.accdb).** |

## Database Design

The following steps were taken to design the database:

##### Create Primary Data Tables

Data tables were created to respond to the priorities identified by states. State SWAP Coordinators and NEFWDTC members were surveyed to identify which key data fields were priorities of SWAP Elements 1-4. These results, as well as the NE Lexicon, were used to identify which key tables, data content and format were needed. More detailed information on these tables is found in Appendices 1-8 where examples are provided for each table.

1-Develop a table of Species and assign each a unique ID.

2-Develop a table of Habitats and assign each a unique ID.

3-(*Optional*) Develop a table of Taxa groups and assign each a unique ID.

4-(*Optional*) Develop a table of Locations and assign each a unique ID.

5-Develop a table of Threats and assign each a unique ID. Use IUCN codes to categorize each Threat.

6-Develop a table of Actions and assign each a unique ID. Use TRACS codes to categorize each Action.

##### Establish Data Relationships

Once tables were created and designed, certain tables needed to be linked to each other in the most meaningful ways. States identified which queries were most important to them, so that helped to guide the relationship design. The following steps and links were created to produce the most functional relational structure:

1. **Species/Habitat Use** – Create a table establishing the relationship of each species to different habitat types using the unique species and habitat IDs.
2. **Assign Threats to Species** – Create a table assigning threats to species using the unique species and threat IDs. Classify each assigned threat according to the Northeast Regional SWAP Lexicon.
3. **Assign Actions to Species Threats** – Create a table assigning actions to each species threat using unique species, threat, and action IDs. Classify each assigned action according to the Northeast Regional SWAP Lexicon.
4. **Develop queries**- Once the tables and relationships were created, the data could be sorted and reported in multiple ways.
5. Standard queries and reports were developed from the guidance of states in anticipation of their use.

The resulting database consists of nine tables in which all data are stored (Table 2). Unique keys in these tables for State, Species, Taxon, Habitat, Location, Threat, and Action are used to establish relational links among the data tables. Full descriptions of each data table can be found in Appendix 2. This relational data structure allows the user to query, analyze, export, and report state wildlife action plan data in a variety of formats.

Custom lookup and report tables, queries, forms, and reports were designed for editing, review, and display the data. A description of these lookup and report tables, queries, forms, and reports can be found in Appendices 3, 4, 5, and 6. Appendix 3 provides descriptions of the lookup and report tables used in the database. Appendix 4 describes the queries used in the database. Appendix 5 describes the forms, subforms and associated reports that were developed and used in the database. Appendix 6 describes the reports that were developed and used in the database. Examples of query designs are shown in Appendix 7. Appendix 8 describes the database design approach with example tables.

In addition to tools provided through the user interface, people familiar with relational databases can easily query, analyze, export, and report state wildlife action plan data in a variety of formats. A few simplified examples of queries and their results can be found in Appendix 7.

**Table 2. Nine data tables of the Northeast Region SWAP Database**

| **Table Name** | **Table Purpose** |
| --- | --- |
| SGCN1 | Stores the species data for all species listed as SGCN in the Northeast Region. This table is related to the SGCN2 table by the species’ unique RegionalID. |
| SGCN2 | Stores state-specific data about species listed as SGCN in the Northeast Region. This table is related to the SGCN1 table by the species’ unique RegionalID. |
| Habitats | Stores the list of habitat types used by states when assigning species to habitat types and when assigning threats and actions to habitats. Each habitat has a unique ID (StateHabitatID). |
| Locations | Stores the list of locations that some states used when assigning threats and actions to locations. Each location has a unique ID (StateLocationID). |
| Taxa | Stores the list of taxa groupings that some states used when assigning threats and actions to taxa. Each taxa has a unique ID (StateTaxonID). |
| Threats | Stores the list of threats identified by states as potentially affecting species, taxa, habitats, and/or locations. The threats are classified by IUCN coding. Each threat has a unique ID (StateThreatID). |
| Actions | Stores the list of actions identified by states to address the threats potentially affecting species, taxa, habitats, and/or locations. The actions are classified by TRACS coding. Each action has a unique ID (StateActionID). |
| SGCNHabitats | Stores the species/habitat relationships identified by each state. |
| ThreatsActions1 | Stores the list of threats identified by states as affecting a particular species, taxa group, habitat type, location, or is considered a statewide threat. These assigned threats are classified by as to their Severity, Reversibility, Immediacy, Spatial Extent, Certainty, and Likelihood as described in the Lexicon (Appendix 1). |
| ThreatsActions2 | Stores the list of actions that states assigned to address the threats assigned in the ThreatsActions1 table. These assigned actions are classified as to their Urgency, Duration, Longevity of Results, Likelihood of Implementation, Likelihood of Success, and Estimated Cost as described in the Lexicon (Appendix 1). |

# Results

### Summary of Key Data Fields Prioritized by State Data in the Northeast Region SWAP Database (12/31/16) by SWAP Element

As described in the preceding section and now summarized here, state SWAP data were provided (at least partially) by all 13 states and DC. Analyses were based upon these available data at the time of this report. Since state data provided were not complete, these results will not be comprehensive or final until all state data are provided and processed. However the results are not expected to change significantly, as most states will not be submitting additional data. Data from several states are expected within the next several months and will be processed as part of the next grant.

Complete analyses and a final report are being developed under the SWAP Roll Up, a parallel project to capture the most meaningful database results, analyze and provide them to NEFWDTC and their partners for application and use in their individual states or regionally.

Summary of status of available key data are presented below by SWAP Element. Element 1= Species of Greatest Conservation Need. Element 2= Key habitats. Element 3= threats or issues to SGCN or Key Habitats. Element 4= Actions to address the threats to SGCN or Key Habitats. The data consists of the data types described in the Northeast Lexicon.

1. Species of Greatest Conservation Need. The species names (scientific and common), associated habitats, and a number of attributes of the species status (federal and state listing status, native or non-native, S and G ranks, IUCN red list score, distribution, threats, population trends, quality of the data, climate vulnerability, etc.) may be provided by states, but not all states may have used all data types.
2. Habitats. Habitats are named following the Northeast Terrestrial Wildlife Habitat Classification System or the Northeast Aquatic Habitat Classification System – or a state system that has been crosswalked to the Northeast Systems.
3. Threats. Threats are named following the IUCN Threat Classification System. Threat risk is also characterized using defined measures like severity, immediacy, reversibility, spatial extent, certainty, and likelihood. Each of these measures has definitions associated with low, medium, and high levels of impact.
4. Actions. Actions are categorized according to the TRACS classification system. Actions are also characterized using defined measures like objective, general strategy, purpose, benefits, estimated costs, performance metric, urgency, duration, longevity of results, likelihood of implementation, likelihood of success, constraints, and implementing organizations, key stakeholders, location, and detailed strategy. States did not provide all of these characterizations, so the database only captures those that were provided.

The information below provides an overview of the quality and quantity of data in the database. It also highlights the variability of data between states which can be explained by the individual approach taken to develop the most effective SWAP for their state. Variability is inherent in such a large amount and spectrum of data, but it does not preclude the identification of broad patterns and shared/common conservation issues and targets for each of the four SWAP Elements. The SWAP Roll Up will present these analyses and results more comprehensively in its 2017 final report.

## **Element 1 – Species of Greatest Conservation Need (SGCN)**

SWAP information about SGCN was compiled from each state. Data were corrected taxonomically and verified with each state. State experts and NEFWDTC taxa teams then provided final review and QA/QC on status and taxonomy.

Throughout the Northeast Region, a total of 2,918 species were designated as SGCN (Figure 1).

**Figure 1. Species designated as Species of Greatest Conservation Need in Northeast SWAPS by taxa.**

This ranged from a low of 203 SGCN in the District of Columbia to a high of 697 SGCN in West Virginia (Table 3). The database provides forms, reports, and search tools to display information regarding each species, its associated habitats, and any threats or actions designated for that species.

**Table 3. Number of species designated as Species of Greatest Conservation Need by SWAPS in the Northeast Region.**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **State** | **Mammals** | **Birds** | **Reptiles** | **Amphibians** | **Fish** | **Invertebrates Arthropods** | **Invertebrates Non-Arthropods** | **Total** |
| CT | 26 | 95 | 16 | 15 | 73 | 219 | 22 | 466 |
| DC | 21 | 58 | 17 | 18 | 12 | 64 | 13 | 203 |
| DE | 23 | 185 | 27 | 19 | 105 | 290 | 41 | 690 |
| MA | 23 | 95 | 20 | 5 | 29 | 97 | 18 | 287 |
| MD | 41 | 143 | 26 | 19 | 31 | 312 | 38 | 610 |
| ME | 22 | 130 | 11 | 4 | 43 | 125 | 43 | 378 |
| NH | 21 | 63 | 9 | 5 | 20 | 40 | 10 | 168 |
| NJ | 35 | 167 | 33 | 23 | 95 | 294 | 10 | 657 |
| NY | 18 | 108 | 28 | 12 | 79 | 94 | 32 | 371 |
| PA | 19 | 90 | 22 | 18 | 65 | 334 | 116 | 664 |
| RI | 21 | 122 | 13 | 10 | 45 | 190 | 52 | 453 |
| VA | 33 | 80 | 33 | 32 | 95 | 446 | 164 | 883 |
| VT | 33 | 50 | 12 | 7 | 29 | 170 | 28 | 329 |
| WV | 29 | 73 | 28 | 35 | 85 | 276 | 171 | 697 |

Table 3 and Figure 1 show the number of SGCN by taxa by state as identified in each state SWAP. Current RSGCN status is still being assessed and developed by NEFWDTC taxa teams and will be reported in the final SWAP Roll Up report.

## **Element 2 – Key Habitats**

## Regional Habitats or Greatest Conservation Need (RHGCN)

The original intention in developing a regional database was for all the states to use a common method for the classification of habitat types (Northeast Lexicon). The Northeast Terrestrial Wildlife Habitat Classification System (NETWHCS) was used by the Lexicon as a flexible framework for characterizing wildlife habitat that works on two levels: habitat systems and structural modifiers (Gawler 2008) <http://rcngrants.org/content/northeastern-terrestrial-wildlife-habitat-classification>. Similarly, theNortheast Aquatic Habitat Classification System (NEAHCS) is a standardized classification system describing and mapping stream systems, lakes, and ponds across the Northeast (Olivero and Anderson 2008) <http://rcngrants.org/content/northeastern-aquatic-habitat-classification-project>. Habitat terms reference these classification systems. Both the aquatic and marine classification systems were under development and undergoing changes, resulting in additional variability in the reporting of these habitats.

Data on SWAP key habitats were compiled. Some states did not utilize the Lexicon resulting in a wide variety of methods that states used to classify habitats. Some states were very general in describing habitats and some were very specific. Habitat designations in submitted data ranged from a low of 10 habitat types designated by New Jersey to a high of 166 habitat types in Maine.

In an attempt to standardize habitat types for analysis, states were asked to crosswalk their habitat types to a list of habitat macrogroups that was developed for the database (Table 4). As the database is currently designed, the crosswalk of habitat types to macrogroups is a one-to-one relationship. A few states noted that some of their habitat types were representative of more than one macrogroup and suggested that the database allow for a one-to-many relationship. In the future, the database could be modified to accommodate a one-to-many relationship and/or develop a new habitat macrogoup classification system. The original habitat types submitted by the states and their relationships to species, threats, and actions are retained in the database and are unaffected by the method of macrogroup designation.

Table 4. List of habitat macrogroups used to standardize habitat types in the Northeast Region SWAP database.

#### Forested Upland

Central Oak-Pine

Large River Floodplain

Northern Hardwood & Conifer

Plantation and Ruderal Forest

Southern Oak-Pine

Boreal Upland Forest

#### 

#### Open Upland

Coastal Grassland & Shrubland

Ruderal Shrubland & Grassland

Outcrop & Summit Scrub

Northern Peatland

Coastal Plain Peatland

Alpine

Agricultural

Wet Meadow/Shrub Marsh

Glade, Barren and Savanna

#### 

#### Aquatic

Vernal Pools

Aquatic

Emergent Marsh

Headwaters and Creeks

Headwaters-Medium River

Lakes and Ponds

Large River

Small/Medium River

#### Swamps

Central Hardwood Swamp

Coastal Plain Swamp

Northern Swamp

#### 

#### Estuarine/Tidal

Tidal Marsh

Tidal Small and Medium River

Tidal Large River

Tidal Headwater and Creek

Estuarine Tidal Riverine Coastal

Estuarine Open Water

Estuarine Coastal

Tidal Swamp

#### 

#### Marine

Marine Nearshore

Marine Oceanic

Marine Offshore

#### 

#### Other

Urban/Suburban Built

Cliff and Talus

Extractive

Riparian

Rocky Coast

Subterranean

The database provides forms, reports, and search tools to display information regarding each habitat, its associated species, and any threats or actions assigned to that habitat. Some states assigned or associated species and/or taxa to habitats in their SWAPS, allowing further analyses (Table 5).

**Table 5. Key habitats by taxa as identified in the 14 NE SWAPS**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Mammals | Birds | Reptiles | Amphibians | Fish | Invertebrates | Total |
| Forested Upland | | | | | | | |
| Central Oak-Pine | 56 | 95 | 38 | 50 | 2 | 498 | 739 |
| Large River Floodplain | 40 | 91 | 31 | 36 | 15 | 184 | 397 |
| Northern Hardwood & Conifer | 56 | 82 | 22 | 31 | 1 | 294 | 486 |
| Plantation and Ruderal Forest | 30 | 51 | 15 | 2 | 0 | 5 | 103 |
| Southern Oak-Pine | 0 | 7 | 2 | 1 | 0 | 2 | 12 |
| Boreal Upland Forest | 22 | 45 | 5 | 9 | 0 | 87 | 168 |
| Open Upland | | | | | | | |
| Coastal Grassland & Shrubland | 15 | 92 | 16 | 7 | 9 | 144 | 283 |
| Ruderal Shrubland & Grassland | 36 | 69 | 31 | 21 | 0 | 226 | 383 |
| Outcrop & Summit Scrub | 15 | 22 | 12 | 4 | 0 | 126 | 179 |
| Northern Peatland | 26 | 72 | 12 | 13 | 3 | 240 | 366 |
| Coastal Plain Peatland | 14 | 7 | 7 | 3 | 0 | 47 | 78 |
| Alpine | 2 | 15 | 0 | 0 | 0 | 6 | 23 |
| Agricultural | 15 | 46 | 18 | 7 | 0 | 122 | 208 |
| Wet Meadow/Shrub Marsh | 31 | 77 | 22 | 19 | 6 | 189 | 344 |
| Glade, Barren and Savanna | 23 | 53 | 21 | 18 | 0 | 158 | 273 |
| Aquatic | | | | | | | |
| Vernal Pools | 22 | 11 | 14 | 29 | 0 | 58 | 134 |
| Aquatic | 0 | 0 | 0 | 0 | 9 | 26 | 35 |
| Emergent Marsh | 28 | 78 | 24 | 17 | 6 | 195 | 348 |
| Headwaters and Creeks | 12 | 10 | 12 | 16 | 162 | 341 | 553 |
| Headwaters-Medium River | 15 | 5 | 6 | 7 | 30 | 61 | 124 |
| Lakes and Ponds | 19 | 81 | 18 | 23 | 58 | 282 | 481 |
| Large River | 20 | 41 | 10 | 8 | 106 | 180 | 365 |
| Small/Medium River | 9 | 13 | 10 | 9 | 91 | 185 | 317 |
| Swamps | | | | | | | |
| Central Hardwood Swamp | 22 | 39 | 11 | 9 | 0 | 21 | 102 |
| Coastal Plain Swamp | 25 | 72 | 22 | 22 | 15 | 93 | 249 |
| Northern Swamp | 34 | 62 | 9 | 12 | 9 | 136 | 262 |
| Estuarine/Tidal | | | | | | | |
| Tidal Marsh | 12 | 86 | 9 | 1 | 20 | 57 | 185 |
| Tidal Small and Medium River | 0 | 0 | 0 | 0 | 8 | 1 | 9 |
| Tidal Large River | 0 | 1 | 0 | 0 | 8 | 3 | 12 |
| Tidal Headwater and Creek | 1 | 2 | 1 | 0 | 7 | 3 | 14 |
| Estuarine Tidal Riverine Coastal | 0 | 24 | 5 | 0 | 29 | 8 | 66 |
| Estuarine Open Water | 2 | 12 | 4 | 0 | 49 | 28 | 95 |
| Estuarine Coastal | 4 | 78 | 1 | 1 | 124 | 74 | 282 |
| Tidal Swamp | 0 | 3 | 0 | 1 | 0 | 0 | 4 |
| Marine | | | | | | | |
| Marine Nearshore | 8 | 55 | 7 | 0 | 67 | 52 | 189 |
| Marine Oceanic | 0 | 9 | 0 | 0 | 64 | 0 | 73 |
| Marine Offshore | 12 | 40 | 5 | 0 | 55 | 28 | 140 |
| Other | | | | | | | |
| Urban/Suburban Built | 17 | 43 | 21 | 16 | 5 | 134 | 236 |
| Cliff and Talus | 22 | 10 | 16 | 14 | 0 | 117 | 179 |
| Extractive | 0 | 6 | 6 | 0 | 0 | 1 | 13 |
| Riparian | 28 | 53 | 16 | 11 | 20 | 235 | 363 |
| Rocky Coast | 0 | 29 | 1 | 1 | 0 | 2 | 33 |
| Subterranean | 13 | 1 | 6 | 9 | 0 | 237 | 266 |

Key Habitats supporting SGCN as identified in NE SWAPS will be reported on in more detail in the 2017 SWAP Roll UP. At the time of this report, RHGCN were still in progress, and the SWAP Roll Up will present RHGCN by habitat associations in more detail.

# **Element 3 – Threats** (Issues and Challenges)

For the purpose of analyzing the types of threats presented in wildlife action plans, states were requested to categorize threats by IUCN category as outlined in the Northeast Regional SWAP Lexicon (Crisfield and the Northeast Fish and Wildlife Diversity Technical Committee 2013).

There were challenges due to variability of the data provided for IUCN categorization of all the threats. Some threats fell under more than one category and required contacting the state and recoding of the dataset to assign it to the Threat category that has the most potential impact. Another issue was that there were some identified threats that did not fit into the existing IUCN categories (e.g. Low Biotic Potential and Loss of Metapopulation Structure). To accommodate threats such as these a new threat category was added to the database, Threat Category #16 - Species Biology/Ecology.

For the purpose of explaining how the database stores and links threat data, the following terminology is used:

**Identified Threat** – A descriptive phrase that identifies a threat that can be assigned to one or more species, taxa, habitats, locations, or statewide. Each Identified Threat has a unique ID. Each Identified Threat should be classified by IUCN coding. Identified Threats are stored in the ***Threats*** data table (See Appendix 2).

**Assigned or Associated Threat** – An Identified Threat assigned to a species, taxa, habitat, location, or statewide. Each Assigned Threat should be classified as to its Severity, Reversibility, Immediacy, Spatial Extent, Certainty, and Likelihood as described in the Lexicon. States may have also include a rank of the threat. Assigned Threats are stored in the ***ThreatsActions1*** data table (See Appendix 2).

Most states had multiple versions of the same Identified Threat repeated in their data tables. This created an unnecessarily large dataset and made it difficult to analyze the importance of various threats based on their frequency. Ideally, there needs to be only one Identified Threat (Threat ID = 1), and that one threat would be assigned to each of the six species. If needed, any additional information further clarifying the threat for a particular species would be stored in the ThreatComments field in the ***ThreatsActions1*** data table (See Appendix 2). As submitted data were standardized and consolidated into the regional database, when possible multiple versions of the same Identified Threat were consolidated into one Identified Threat.

Data on threats were compiled as provided from the 14 NE SWAPS. Table 6 lists the number of threats identified and assigned to IUCN levels. Not all states provided data on all IUCN levels, nor did they assign them to both species and habitats.

**Table 6. Number of Identified Threats for each state and the number of Identified Threats that were categorized at the three IUCN levels.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **State** | **Identified Threats** | **Categorized at IUCN**  **Level 1** | **Categorized at IUCN**  **Level 2** | **Categorized at IUCN**  **Level 3** |
| CT | 58 | 58 | 42 | 2 |
| DC | 36 | 36 | 36 | 10 |
| DE | 483 | 483 | 483 | 199 |
| MA | 259 | 259 | 259 | 34 |
| MD | 205 | 205 | 205 | 145 |
| ME | 45 | 45 | 45 | 0 |
| NH | 722 | 722 | 722 | 80 |
| NJ | 123 | 123 | 123 | 123 |
| NY | 35 | 35 | 35 | 0 |
| PA | 599 | 599 | 599 | 0 |
| RI | 510 | 510 | 510 | 4 |
| VA | 40 | 40 | 40 | 4 |
| VT | 28 | 26 | 26 | 2 |
| WV | 62 | 36 | 36 | 0 |

Some states linked threats to all targets, while others linked or assigned them to only one. Table 7 lists the number of threats assigned to either species, taxa groups, habitat types, locations or statewide.

**Table 7. Number of threats assigned to species, taxa groups, habitat types, locations, or statewide in each state.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **State** | **Assigned to Species** | **Assigned to Taxa** | **Assigned to Habitats** | **Assigned to Locations** | **Assigned Statewide** | **Total** |
| CT | 0 | 23 | 310 | 0 | 34 | 367 |
| DC | 0 | 0 | 176 | 0 | 0 | 176 |
| DE | 83 | 343 | 192 | 0 | 119 | 737 |
| MA | 0 | 0 | 1,098 | 0 | 0 | 1,098 |
| MD | 210 | 88 | 0 | 0 | 0 | 298 |
| ME | 1,431 | 65 | 480 | 0 | 0 | 1,976 |
| NH | 1,173 | 0 | 508 | 0 | 0 | 1,681 |
| NJ | 82 | 166 | 0 | 0 | 0 | 248 |
| NY | 2,129 | 0 | 0 | 0 | 0 | 2,129 |
| PA | 1,075 | 0 | 0 | 0 | 0 | 1,075 |
| RI | 1,471 | 80 | 359 | 0 | 12 | 1,922 |
| VA | 0 | 228 | 79 | 0 | 0 | 307 |
| VT | 396 | 20 | 168 | 0 | 0 | 584 |
| WV | 0 | 67 | 358 | 400 | 0 | 825 |

The Northeast Lexicon also provided criteria with which to assess and characterize threats. These included severity, reversibility, immediacy, spatial extent, certainty, and likelihood. Not all state utilized all the criteria, but most states did utilize at least a few. Table 8 lists the number of threats that each state applied the lexicon risk criteria. Only some states assigned threat characteristics to all threats.

**Table 8. Number of Assigned Threats that were classified as recommended by the Lexicon or ranked.**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **State** | **Total Assigned Threats** | **Classified for Severity** | **Classified for Reversibility** | **Classified for Immediacy** | **Classified for Spatial Extent** | **Classified for Certainty** | **Classified for Likelihood** | **Ranked** |
| CT | 367 | 355 | 355 | 355 | 349 | 352 | 352 | 0 |
| DC | 176 | 176 | 176 | 176 | 176 | 176 | 176 | 176 |
| DE | 737 | 642 | 641 | 639 | 640 | 640 | 639 | 681 |
| MA | 1,098 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MD | 298 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ME | 1,976 | 1,757 | 320 | 320 | 321 | 321 | 321 | 0 |
| NH | 1,681 | 1,643 | 1,640 | 1,640 | 1,642 | 1,640 | 1,639 | 0 |
| NJ | 248 | 0 | 0 | 0 | 0 | 0 | 0 | 248 |
| NY | 2,129 | 2,129 | 2,129 | 0 | 2,129 | 2,129 | 0 | 0 |
| PA | 1,075 | 823 | 855 | 856 | 846 | 855 | 855 | 0 |
| RI | 1,922 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| VA | 307 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| VT | 584 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| WV | 825 | 0 | 0 | 0 | 0 | 0 | 0 | 758 |

Figure 2 depicts the number of threats assigned to each IUCN category (level 1). It is clear that pollution and development are the most frequently cited threats to SWAP targets. Invasive species/Disease, Natural systems modifications, and climate change follow closely as additional key regional threats. Several other threats including biological resource use, resource information needs, transportation, human disturbance, and energy production were also considered top threats by many SWAPS.

**Figure 2. Number of Assigned Threats by IUCN category for all states in the Northeast Region.**

The SWAP Roll Up report will provide more detailed analyses and discussion of these threats. Additionally it will report on these results in comparison to regional surveys that identify and confirm top priorities for key regional species and habitats.

## Element 4 – Actions

For the purpose of analyzing the types of actions presented in wildlife action plans, states were requested to categorize actions by TRACS category as outlined in the Northeast Regional SWAP Lexicon (Crisfield and the Northeast Fish and Wildlife Diversity Technical Committee 2013). For the purpose of explaining how the database stores and links action data, the following terminology is used:

**Identified Action** – A descriptive phrase that identifies an action that can be assigned to one or more threats that have been assigned to a species, a taxa group, a habitat, a location, or statewide. Each Identified Action has a unique ID. Each Identified Action should be classified by TRACS coding. Identified Actions are stored in the ***Actions*** data table (See Appendix 2).

**Assigned or Associated Action** – An Identified Action assigned to an Assigned Threat. Each Assigned Action should be classified as to its Urgency, Duration, Longevity of Results, Likelihood of Implementation, Likelihood of Success, and Estimated Cost as described in the Lexicon. States may have also include a rank of the action. Assigned Actions are stored in the ***ThreatsActions2*** data table (See Appendix 2).

**Unassociated Actions** – An action assigned to a species, taxa, habitat, location, or statewide that is not associated with a specific threat. Ideally, each Assigned Action would be linked to a threat that was assigned to a species, taxa, habitat, location, or statewide. Unassociated Actions are stored in the ***ThreatsActions2*** data table (See Appendix 2).

As was discussed above with threats, most states had multiple versions of the same Identified Action repeated in their data tables. As submitted data were standardized and consolidated into the regional database, when possible multiple versions of the same Identified Action were consolidated into one Identified Action. Below is a summary of the action related data that were submitted (Tables 9 – 11 and Figure 3).

States were asked to identify and classify their SWAP actions to the lowest TRACS hierarchical level possible. Table 9 lists the number of actions, by state, and the TRACS level to which they coded their SWAP actions.

**Table 9. Number of Identified Actions by state categorized at the three TRACS levels.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **State** | **Identified Actions** | **Categorized at TRACS Level 1** | **Categorized at TRACS Level 2** | **Categorized at TRACS Level 3** |
| CT | 131 | 131 | 115 | 68 |
| DC | 36 | 36 | 36 | 0 |
| DE | 841 | 841 | 841 | 342 |
| MA | 351 | 0 | 0 | 0 |
| MD | 219 | 219 | 219 | 75 |
| ME | 456 | 456 | 456 | 0 |
| NH | 394 | 394 | 394 | 52 |
| NJ | 920 | 920 | 920 | 920 |
| NY | 1,217 | 1,217 | 1,217 | 0 |
| PA | 936 | 936 | 936 | 0 |
| RI | 1,063 | 1,063 | 1,063 | 114 |
| VA | 63 | 63 | 63 | 20 |
| VT | 487 | 487 | 487 | 17 |
| WV | 26 | 25 | 0 | 0 |

Most states linked their SWAP actions to the threats and targets they addressed (Table 10). Some states linked their actions to species threats, while others linked them to taxa, habitat, and geographic location threats including statewide. Some states provided linkages to multiple targets, other to only one target.

**Table 10. Number of actions assigned to a species, taxa group, habitat type, location, or statewide in each state.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **State** | **Assigned to Species** | **Assigned to Taxa** | **Assigned to Habitat** | **Assigned to Location** | **Assigned Statewide** | **Total** |
| CT | 0 | 34 | 498 | 0 | 76 | 608 |
| DC | 0 | 0 | 355 | 0 | 0 | 355 |
| DE | 104 | 514 | 462 | 0 | 284 | 1,364 |
| MA | 0 | 0 | 0 | 0 | 0 | 0 |
| MD | 285 | 139 | 0 | 0 | 0 | 424 |
| ME | 184 | 153 | 705 | 0 | 0 | 1,042 |
| NH | 501 | 0 | 131 | 0 | 0 | 632 |
| NJ | 0 | 0 | 0 | 0 | 0 | 0 |
| NY | 4,477 | 0 | 0 | 0 | 0 | 4,477 |
| PA | 1,387 | 0 | 0 | 0 | 3 | 1,390 |
| RI | 2,723 | 416 | 695 | 0 | 105 | 3,939 |
| VA | 0 | 389 | 139 | 0 | 0 | 528 |
| VT | 704 | 57 | 15 | 0 | 0 | 776 |
| WV | 0 | 77 | 0 | 0 | 0 | 77 |

As with Actions, the Northeast Lexicon provided criteria with which to classify or describe actions. These include important factors of urgency, duration, longevity, likelihood of implementation and success, and cost. Most states did not utilize or provide all the ranking criteria, but most provided at least a few in common. Most ranking systems were similar enough that they could be compared/crosswalked. Table 11 lists the number of actions that were assigned and classified by these criteria.

**Table 11. Number of Assigned Actions that were classified as recommended by the Lexicon or ranked.**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **State** | **Total Assigned Actions** | **Classified for Urgency** | **Classified for Duration** | **Classified for Longevity of Results** | **Classified for Likelihood of Implementation** | **Classified for Likelihood of Success** | **Classified for Estimated Cost** | **Rank** |
| CT | 608 | 439 | 0 | 0 | 0 | 439 | 439 | 0 |
| DC | 355 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| DE | 1,364 | 1,186 | 930 | 931 | 1,187 | 1,187 | 1,185 | 1,302 |
| MD | 424 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ME | 1,015 | 1,042 | 0 | 0 | 0 | 184 | 0 | 0 |
| NH | 463 | 498 | 0 | 496 | 441 | 0 | 498 | 0 |
| NY | 4,477 | 4,477 | 0 | 4,477 | 0 | 0 | 4,477 | 2,101 |
| PA | 1,387 | 0 | 876 | 0 | 0 | 883 | 883 | 892 |
| RI | 3,939 | 0 | 0 | 0 | 0 | 0 | 0 | 2,970 |
| VA | 528 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| VT | 619 | 0 | 0 | 0 | 0 | 0 | 0 | 582 |
| WV | 77 | 0 | 0 | 0 | 0 | 0 | 0 | 77 |

SWAP Key Action Data, compiled by TRACS level 1 category, are depicted in Figure 3. The two most commonly cited actions by SWAPs were Data Collection and Analyses and Direct Management of Natural Resources. These top actions were followed by Law and Policy, Outreach, and Planning. Coordination and Administration, technical assistance and Acquisition and Protection were also frequently cited as important cations in SWAPS.

**Figure 3. Number of Assigned Actions by TRACS category for all states in the Northeast Region.**

The SWAP Roll Up report will provide more detailed analyses and discussion of these actions. Additionally it will report on these results in comparison to regional surveys that identify and confirm top priorities for key regional species and habitats.

# Discussion

### Use and limitations of the data

The methods and results section describe how the data were requested and received in order to maximize consistency between states and terminology. Significant progress was made in this regards due to the development and use of the Northeast Lexicon. However, data variability remains a significant challenge in the analyses and interpretation of these data, since the Lexicon was not consistently or fully applied in many states. Further QA/QC efforts sought to further improve data quality, as states were asked to validate and edit their coded data using a specialized data editing tool (Excel worksheet) that utilized dropdown menus to restrict data content and format to the consistent fields. Because all states did not fully utilize these tools, discrepancies and differences in the data fields and data resulted. These differences were addressed by working with each individual state to resolve them, but some data were simply not collected or provided at all or in a compatible format.

Regardless of the data variability, certain patterns and commonalties were revealed by the data compilation. Further, the database allows for many types of additional queries and analyses depending upon he needs of the user. Table 12 provides a conceptual matrix that begins to explore the kinds of questions that can be asked of the database.

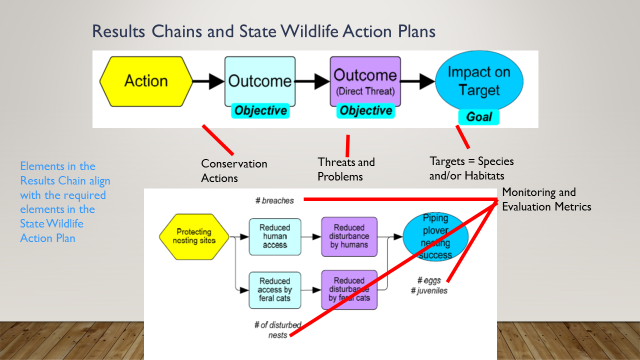
**Table 12. Potential queries to discover relationships between SWAP Database Elements.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Possible Queries** | **Species** | **Habitats** | **Threats** | **Actions** | **Monitoring Protocols** |
| **Species** | Which species is NE most responsible for? Which occur in # states? Which are RSGCN, T/E etc. | What habitats support the most X species? Which taxa | What are top threats to X species? (i.e. most responsible, most imperiled, most broad) | What are top actions to address threats to X species? | What aspect of species/ populations best monitored for outcome? |
| **Habitat** | What species are associated with what habitats, which supports most SGCN, RSGCN, etc.? | Which habitats are most widespread, most frequently listed in region, etc. | What are top threats to X habitats? Which habitats are most vulnerable to X threat? | What are top actions to address threats to X habitats? | What aspect of species/ populations best monitored for outcome? |
| **Threat** | Which species are most vulnerable to which threats? | Which habitats are most vulnerable to x threats? | Which threats are /ranked highest in severity, reversibility, spatial extent, etc.? | What are the x actions that address the x threats? | How to monitor/measure effectiveness at abating these threats |
| **Action** | Which species are best addressed by X actions? | Which habitats are addressed by X actions? | What threats are best addressed by x actions? | Which actions are ranked highest in likelihood of success, urgency, cost, etc.? | How to monitor/measure effectiveness at accomplishing outcome |

There are two levels of query that are possible through the Regional Wildlife Action Plan Database/ Search Tool. The first is between Elements. In these queries, the tool makes it possible to discover which species are affected by a given threat, and which may be supported by a given action. A simpler query is within an element such as:

* Find Actions that are ready for implementation
* Find Actions that are urgent
* Find Actions that are shared by neighboring states for x species or habitat
* Find Habitats that support the most RSGCN
* Find Emerging Threats shared by X states
* Find Species with G-rank lower than 2
* Find Species list in X states

The database also facilitates the development of results chains that select the actions to key threats to SWAP targets that meet desired outcomes. By capturing and organizing the data in Elements 1-4, this facilitates the creation of results chains, like the example in Figure 4.



**Figure 4. Example of Results Chain for PIPL Management (TCI 2008)**

## Conclusion and Recommendations

## The Database compiled basic information on key SWAP data fields that elucidates common or shared species, habitats, threats and actions. Analyses are limited due to data variability, however key patterns and priorities have been revealed. The database with its many reports and queries, can be used by individual states and their partners to answer many questions and organize data from the 14 northeast SWAPs.

## States have many unique reasons to use a database to organize the information in their own State Wildlife Actions Plans. Some common reasons are:

## Enabling partners and the public to search the State Wildlife Action Plan

## Tracking plan implementation outside Wildlife TRACS

## Facilitating review and revision

## Reporting progress to the public on a regular basis

### Since the regional database is extracted from the SWAP databases of individual states, each state retains ownership of their state’s data, and agrees to make their data available to the other states and any other users with access to the database. Known sensitivities to be addressed include specific spatial data on sensitive species that should not be included in or linked to this database. However, states are comfortable presenting all of the data in this database at the HUC 12 or county level of detail.

## The region (NEFWDTC, NEAFWA and their partners) recognized many benefits that could be achieved by creating this shared database and its consistent Northeast Lexicon terminology. These advantages have also been promoted by the Association of Fish and Wildlife Agencies, and states nationwide are interested in the progress made in the Northeast Region. Some of the services a regional database would provide are:

## Sharing information with neighboring states

## Allowing regional and national conservation organizations to better prioritize their complementary work in the Northeast Region

## Facilitating regional funding prioritization

## Preventing duplication of effort

## 

## The database is recommended to be useful to a wide range of potential users including:

## State Wildlife Action Plan Coordinators and other Fish and Wildlife Agency staff

## State, Federal, or Tribal Land Managers

## Scientific Experts contributing to the Wildlife Action Plans

## Non-profit Conservation Organizations

## The Public

### Next steps/future use of data

In order to best utilize this database, it is recommended that states revisit their objectives for it. NEFWDTC and SWAP coordinators should together evaluate and use the data for the purposes they agree are priorities. They should also determine if or how they want to use a database in the future and specifically design their databases now to reflect those objectives. If states can develop these objectives in the next 5 years, they can prepare their state databases for tracking key data that can again be shared on a regional level. Other partners can also be involved in the database evaluation and asked what their future uses/needs may be from this 2015 or the coming 2025 SWAP revisions.

The original goal was to provide broad, regional patterns and priorities while maintaining state specific data in their own individual compatible state databases using the NE SWAP data template. Many states felt this was too detailed and cumbersome, and chose not to utilize the template. The template was designed to capture a means of measuring performance compatible with the TRACS system. If states objectives are to be able to measure success and monitor their progress on elements 1-4, then this template can be used as a foundation to refine the information they wish to capture at a more detailed level. If however states wish to capture only the broad, regional patterns, then this database can be refined and utilized as a foundation to produce the information they wish to capture.

During this process, OFWIM was contacted for their guidance and input. They provided a quick assessment and recommendation that state agencies may want to consider in creating and maintaining a SWAP database in the context of their other state databases. States may want to consider to what extent it can be integrated into their existing state information management systems, or designed for more state compatibility while maintaining compatibility with the regional NE SWP database.

***This NE SWAP Database was supported by State Wildlife Grant funding awarded through the Northeast Regional Conservation Needs (RCN) Program.  The RCN Program joins thirteen northeast states, the District of Columbia, and the U.S. Fish and Wildlife Service in a partnership to address landscape-scale, regional wildlife conservation issues.  Progress on these regional issues is achieved through combining resources, leveraging funds, and prioritizing conservation actions identified in the State Wildlife Action Plans.  See RCNGrants.org for more information.***

# Appendices

**Appendix 1. Instructions for entering data in the NERegionalSWAPData.xls MS Excel file.**

1. **Develop a table of Species and assign each a unique ID. (SGCN Worksheet)**
2. **Develop a table of Habitats and assign each a unique ID. For each habitat type, select a Macrogroup that most closely represents that habitat. (Habitats Worksheet)**
3. **If Threats and Actions will be assigned to Taxa Groups, develop a table of Taxa and assign each a unique ID. (Taxa Worksheet)**
4. **If Threats and Actions will be assigned to specific locations, develop a table of Locations and assign each a unique ID. (Locations Worksheet)**
5. **Develop a table of Threats and assign each a unique ID. Use IUCN codes to classify each Threat. Note that the same Threat may be assigned to more than one species, habitat, taxa, or location. (Threats Worksheet)**
6. **Develop a table of Actions and assign each a unique ID. Use TRACS codes to classify each Action. Note that the same Action may be assigned to Threats affecting more than one species, habitat, taxa, or location. (Actions Worksheet)**
7. **Develop a table that uses the unique Species ID and Habitat ID to associate species with different habitats. (SGCN-Habitats Worksheet)**
8. **If Threats are assigned to Species, develop a table that uses the unique Species Id and Threat ID to associate the threats to a specific species. Classify each Threat using the threat classifications from the Lexicon (see Threat Classifications Table below). (SGCN-Threats Worksheet)**
9. **If Actions are assigned to Species Threats, develop a table that uses the unique Species Id, Threat ID, and Action ID to associate the Actions to the Species Threats. Classify each Action using the action classifications from the Lexicon (see Action Classifications Table below). (SGCN-Actions Worksheet)**
10. **If Threats are assigned to Taxa, develop a table that uses the unique Taxon Id and Threat ID to associate the threats to a specific taxon. Classify each Threat using the threat classifications from the Lexicon (see Threat Classifications Table below). (Taxa-Threats Worksheet)**
11. **If Actions are assigned to Taxa Threats, develop a table that uses the unique Taxon Id, Threat ID, and Action ID to associate the Actions to the Taxa Threats. Classify each Action using the action classifications from the Lexicon (see Action Classifications Table below). (Taxa-Actions Worksheet)**
12. **If Threats are assigned to Habitats, develop a table that uses the unique Habitat Id and Threat ID to associate the threats to a specific habitat. Classify each Threat using the threat classifications from the Lexicon (see Threat Classifications Table below). (Habitat-Threats Worksheet)**
13. **If Actions are assigned to Habitat Threats, develop a table that uses the unique Habitat Id, Threat ID, and Action ID to associate the Actions to the Habitat Threats. Classify each Action using the action classifications from the Lexicon (see Action Classifications Table below). (Habitat-Actions Worksheet)**
14. **If Threats are assigned to Locations, develop a table that uses the unique Location Id and Threat ID to associate the threats to a specific location. Classify each Threat using the threat classifications from the Lexicon (see Threat Classifications Table below). (Location-Threats Worksheet)**
15. **If Actions are assigned to Location Threats, develop a table that uses the unique Location Id, Threat ID, and Action ID to associate the Actions to the Location Threats. Classify each Action using the action classifications from the Lexicon (see Action Classifications Table below). (Location-Actions Worksheet)**
16. **If Threats are considered Statewide, develop a table that uses the unique Threat ID to identify statewide threats. Classify each Threat using the threat classifications from the Lexicon (see Threat Classifications Table below). (Statewide-Threats Worksheet)**
17. **If Actions are assigned to Statewide Threats, develop a table that uses the unique Threat ID and Action ID to associate the Actions to the Statewide Threats. Classify each Action using the action classifications from the Lexicon (see Action Classifications Table below). (Statewide-Actions Worksheet)**

**Threat Classifications**

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

**Action Classifications**

| **Urgency This is a relative estimate of the urgency of the action given the severity of the threats and the priority of the species or habitat.**   * **Initiate immediately (2016)** * **Initiate within 5 years (2017-2020)** * **Initiate within 5-10 years (2020-2025)** * **Can wait 10 years to initiate (2025)** |
| --- |
| **Duration How long will action take to complete (or need to persist)?**   * **<1 year** * **1-2 years** * **2-5 years** * **5-10 years** * **>10 years** |
| **Longevity of Results How long will the benefits continue after the action is completed?**   * **<3 years** * **3-10 years** * **10-20 years** * **20-50 years** * **>50 years** |
| **Likelihood of Implementation Can the action be implemented?**   * **Unlikely/Unknown (<30%)** * **Likely (30-90%)** * **Certain/Very Likely (90-100%)** |
| **Likelihood of Success To what degree will the action address the threat or improve species’ populations or habitats?**   * **Unlikely/Unknown (<30% - not tested/implemented anywhere)** * **Likely (30-90% - e.g., BMP or sufficient information available)** * **Certain/Very Likely (90-100% - demonstrated by other projects)** |
| **Estimated Cost 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.**   * **Unknown** * **< $10,000** * **$10,000 - $49,999** * **$50,000 - $99,999** * **$100,000 - $499,999** * **$500,000 - $999,999** * **> $1,000,000** |

**Appendix 2. Description of the nine tables used to store all data of the Northeast Region SWAP database.**

|  |  |
| --- | --- |
| **Table: SGCN1**  **Stores the species data for all species listed as SGCN in the Northeast Region. This table is related to the SGCN2 table by the species’ unique RegionalID.** | |
| **Field Name** | **Description** |
| **Taxon** | **Major taxa group of a species. Possible values = Mammals, Birds, Reptiles, Amphibians, Fish, Invertebrate–Arthropods, Invertebrate-Non Arthropods.** |
| **SubTaxon** | **Minor taxa group of species. (e.g. snake, lizard, turtle)** |
| **RegionalID** | **Unique ID used for species across the Region.** |
| **ELCODE** | **NatureServe unique identifier for a species (not available for all species).** |
| **CommonName** | **Species common name.** |
| **ScientificName** | **Species scientific name.** |
| **FederalStatus** | **Federal status of the species. E=Endangered, T=Threatened, E/T=Endangered/Threatened, C=Candidate, PE=Proposed Endangered, PT=Proposed Threatened.** |
| **2016RSGCNCategory** | **As of 2016 review, designation if a species is determined to be a Regional Species of Greatest Conservation Need. Possible values = Very High Concern, High Concern, Moderate Concern, Data Deficient.** |
| **2016Responsibility** | **As of 2016 review, the amount of the species range that is contained in the Northeast Region.** |
| **2016DataDeficient** | **As of 2016 review, Yes/No value indicating if more data is needed to determine if more data is needed to determine the species status.** |
| **GlobalRank** | **Species global conservation status rank according to NatureServe.** |
| **RoundedGlobalRank** | **Species rounded global conservation status rank according to NatureServe.** |
| **IUCNRedList** | **Species IUCN Red List categorization.** |
| **2013RSGCNResponsibility** | **As of 2013 review, the relative amount of the species range that is contained in the Northeast Region.** |
| **2013RSGCNConcern** | **As of 2013 review, the relative importance of the species as an RSGCN species.** |

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| **Table: SGCN2**  **Stores state-specific data about species listed as SGCN in the Northeast Region. This table is related to the SGCN1 table by the species’ unique RegionalID.** | |
| **Field Name** | **Description** |
| **State** | **Two letter abbreviation of the state.** |
| **StateSpeciesID** | **Unique ID used by the state for the species.** |
| **RegionalID** | **Unique ID used for species across the Region.** |
| **SGCNStatus** | **Priority ranking a state assigned to a SGCN. (not done by all states)** |
| **StateListing** | **State listing status for states which maintain a state list.** |
| **SRank** | **Species subnational conservation status rank according to NatureServe.** |
| **Comments** | **Any comments relative to the species.** |
| **StateTaxonID** | **Unique ID of a taxon group used by the state. Only used if a state directly associated a species to a specific taxa. The StateTaxonID value would relate to the StateTaxonID value found in the table Taxa.** |

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| **Table: Habitats**  **Stores the list of habitat types used by states when assigning species to habitat types and when assigning threats and actions to habitats. Each habitat has a unique ID (StateHabitatID).** | |
| **Field Name** | **Description** |
| **State** | **Two letter abbreviation of the state.** |
| **StateHabitatID** | **Unique ID used by the state for the habitat type.** |
| **StateHabitatName** | **Name of habitat type.** |
| **Macrogroup** | **Closest regional habitat macrogroup to which the state habitat type corresponds.** |
| **Extent** | **Description of the extent of the habitat type in the state.** |
| **Condition** | **Description of the condition of the habitat type in the state.** |

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| **Table: Locations**  **Stores the list of locations that some states used when assigning threats and actions to locations. Each location has a unique ID (StateLocationID).** | |
| **Field Name** | **Description** |
| **State** | **Two letter abbreviation of the state.** |
| **StateLocationID** | **Unique ID used by the state for a location such as a Conservation Opportunity Area or Wildlife Management Area.** |
| **StateLocationName** | **Name of location.** |

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| **Table: Taxa**  **Stores the list of taxa groupings that some states used when assigning threats and actions to taxa. Each taxa has a unique ID (StateTaxonID).** | |
| **Field Name** | **Description** |
| **State** | **Two letter abbreviation of the state.** |
| **StateTaxonID** | **Unique ID used by the state for the taxon type, such as waterbirds.** |
| **StateTaxonName** | **Name of taxon.** |
| **TaxaGroup** | **Name of a higher level taxon to which the taxon could be assigned for report purposes (e.g. Birds).** |
| **TaxaSort** | **An integer assigned to the taxon for the purposes of sorting or grouping taxon in reports.** |

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| **Table: Threats**  **Stores the list of threats identified by states as potentially affecting species, taxa, habitats, and/or locations. The threats are classified by IUCN coding. Each threat has a unique ID (StateThreatID).** | |
| **Field Name** | **Description** |
| **State** | **Two letter abbreviation of the state.** |
| **StateThreatID** | **Unique ID used by the state for the identified threat.** |
| **StateThreat** | **Description of the threat.** |
| **IUCN1Code** | **Tier 1 code that corresponds to the threat’s IUCN classification.** |
| **IUCN2Code** | **Tier 2 code that corresponds to the threat’s IUCN classification.** |
| **IUCN3Code** | **Tier 3 code that corresponds to the threat’s IUCN classification.** |

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| **Table: Actions**  **Stores the list of actions identified by states to address the threats potentially affecting species, taxa, habitats, and/or locations. The actions are classified by TRACS coding. Each action has a unique ID (StateActionID).** | |
| **Field Name** | **Description** |
| **State** | **Two letter abbreviation of the state.** |
| **StateActionID** | **Unique ID used by the state for the identified action.** |
| **StateAction** | **Description of the action.** |
| **TRACS1Code** | **Tier 1 code that corresponds to the action’s TRABCS classification.** |
| **TRACS2Code** | **Tier 2 code that corresponds to the action’s TRABCS classification.** |
| **TRACS3Code** | **Tier 3 code that corresponds to the action’s TRABCS classification.** |

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| **Table: SGCNHabitats**  **Stores the species/habitat relationships identified by each state.** | |
| **Field Name** | **Description** |
| **State** | **Two letter abbreviation of the state.** |
| **StateSpeciesID** | **Unique ID used by the state for the species.** |
| **RegionalID** | **Unique ID used for species across the Region.** |
| **StateHabitatID** | **Unique ID used by the state for the habitat type.** |

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| **Table: ThreatsActions1**  **Stores the list of threats identified by states as affecting a particular species, taxa group, habitat type, location, or is considered a statewide threat. These assigned threats are classified by as to their Severity, Reversibility, Immediacy, Spatial Extent, Certainty, and Likelihood as described in the Lexicon.** | |
| **Field Name** | **Description** |
| **State** | **Two letter abbreviation of the state.** |
| **StateThreatID** | **Unique ID used by the state for the identified threat. Corresponds to StateThreatID value in the table Threats.** |
| **StateSpeciesID** | **Unique ID used by the state for the species. Left blank if the threat is not assigned to a species.** |
| **RegionalID** | **Unique ID used for species across the Region. Left blank if the threat is not being assigned to a species.** |
| **StateTaxonID** | **Unique ID used by the state for the taxon type. Left blank if the threat is not being assigned to a taxon.** |
| **StateHabitatID** | **Unique ID used by the state for the habitat type. Left blank if the threat is not being assigned to a habitat.** |
| **StateLocationID** | **Unique ID used by the state for a location. Left blank if the threat is not being assigned to a location.** |
| **ThreatSeverity** | **Lexicon Classification Values: Slight, Moderate, Severe** |
| **ThreatReversibility** | **Lexicon Classification Values: Reversible, Reversible with difficulty, Irreversible** |
| **ThreatImmediacy** | **Lexicon Classification Values: Long-term, Near-term, Immediate** |
| **ThreatSpatialExtent** | **Lexicon Classification Values: Localized, Dispersed or Patchy, Pervasive** |
| **ThreatCertainty** | **Lexicon Classification Values: Low, Moderate, High** |
| **ThreatLikelihood** | **Lexicon Classification Values: Unlikely, Likely, Occurring** |
| **ThreatRank** | **Threat priority ranking if done by state.** |
| **ThreatComments** | **Comments or notes about the assigned threat.** |
| **Note: For threats considered by a state to be statewide, StateSpeciesID, RegionalID, StateTaxonID, StateHabitatID, and StateLocationID would all be left blank.** | |

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| **Table: ThreatsActions2**  **Stores the list of actions that states assigned to address the threats assigned in the ThreatsActions1 table. These assigned actions are classified as to their Urgency, Duration, Longevity of Results, Likelihood of Implementation, Likelihood of Success, and Estimated Cost as described in the Lexicon.** | |
| **Field Name** | **Description** |
| **State** | **Two letter abbreviation of the state.** |
| **StateThreatID** | **Unique ID used by the state for the identified threat. Corresponds to StateThreatID value in the table Threats.** |
| **StateActionID** | **Unique ID used by the state for the identified action. Corresponds to StateActionID value in the table Actions.** |
| **StateSpeciesID** | **Unique ID used by the state for the species. Left blank if the action is not assigned to a species threat.** |
| **RegionalID** | **Unique ID used for species across the Region. Left blank if the action is not being assigned to a species threat.** |
| **StateTaxonID** | **Unique ID used by the state for the taxon type. Left blank if the action is not being assigned to a taxon threat.** |
| **StateHabitatID** | **Unique ID used by the state for the habitat type. Left blank if the action is not being assigned to a habitat threat.** |
| **StateLocationID** | **Unique ID used by the state for a location. Left blank if the action is not being assigned to a location threat.** |
| **ActionUrgency** | **Lexicon Classification Values: Initiate immediately, Initiate within 5 years, Initiate within 5-10 years, Can wait 10 years** |
| **ActionDuration** | **Lexicon Classification Values: <1 year, 1-2 years, 2-5 years, 5-10 years, >10 years** |
| **ActionLongevityofResults** | **Lexicon Classification Values: <3 years, 3-10 years, 10-20 years, 20-50 years, >50 years** |
| **ActionLikelihoodofImplementation** | **Lexicon Classification Values: Unlikely/Unknown, Likely, Certain/Very Likely** |
| **ActionLikelihoodofSuccess** | **Lexicon Classification Values: Unlikely/Unknown, Likely, Certain/Very Likely** |
| **ActionEstimatedCost** | **Lexicon Classification Values: Unknown, < $10,000, $10,000 - $49,999, $50,000 - $99,999, $100,000 - $499,999, $500,000 - $999,999, > $1,000,000** |
| **ActionRank** | **Action priority ranking if done by state.** |
| **ActionComments** | **Comments or notes about the assigned action.** |
| **Note: For actions being assigned to statewide threats, StateSpeciesID, RegionalID, StateTaxonID, StateHabitatID, and StateLocationID would all be left blank.** | |

**Appendix 3. Description of the lookup and report tables used in the Northeast Region SWAP database.**

**Lookup Tables**

**LookupIUCNThreats – This table contains the IUCN categories and corresponding codes that are used to classify threats. It is used by various forms and reports for displaying and selecting IUCN categories.**

**LookupTRACSActions – This table contains the TRACS categories and corresponding codes that are used to classify actions. It is used by various forms and reports for displaying and selecting TRACS categories.**

**LookupMacrogroups – This table contains the list of habitat macrogroups that are used to consolidate the various state habitat types into common habitat macrogroups for the region. It is used by various forms and reports for displaying and selecting habitat macrogroups.**

**Report Tables**

**SGCNMacrogroup – This table contains the unique RegionalID of each species that was identified as using a specific habitat macrogroup. For each species occurring in a habitat macrogroup, the list of states where this occurs is also listed. This table is generated by the query SGCNMacrogroup3. This query is run when the “Update Report Tables” button is selected on the main form. Associated reports: MacrogroupSGCNSubreport of the MacrogroupSGCN report.**

**SGCNState – This table contains the unique RegionalID of each species that was identified as SGCN in one or more states. For each species, the states where it was listed as SGCN is displayed. This table is generated by the query SGCNState3. This query is run when the “Update Report Tables” button is selected on the main form. Associated reports: SGCNState.**

**StateHabitatTaxaTally – This table contains the number of species in major taxa groups that use various state habitat types. This table is generated by the query StateHabitatTaxaTally3. This query is run when the “Update Report Tables” button is selected on the main form. Associated reports: StateHabitatTaxaTally.**

**TaxonOrder – This table contains the major taxa groups and a corresponding number used by forms and reports to display taxa groups in the sorted order of Mammals, Birds, Reptiles, Amphibians, Fish, Invertebrate-Arthropods, and Invertebrate-Non Arthropods.**

**Appendix 4. Description of the queries used in the Northeast Region SWAP database.**

**Grouping Queries**

**The following queries are used to count occurrences and organize data on select forms and reports.**

**ActionsHabitatsGrouped – Query to count the number of habitat types to which an identified action is assigned. Associated forms: Actions**

**ActionsLocationGrouped – Query to count the number of locations to which an identified action is assigned. Associated forms: Actions**

**ActionsSGCNGrouped – Query to count the number of species to which an identified action is assigned. Associated forms: Actions, SGCN**

**ActionsStatewideGrouped – Query to count the number of identified actions that were assigned as statewide actions. Associated forms: StateReports**

**ActionsTaxaGrouped – Query to count the number of taxa groups to which an identified action is assigned. Associated forms: Actions**

**LookUpIUCN1 – Query to group the values in the LookUpIUCNThreats table into the major IUCN categories.**

**LookUpTRACS1 – Query to group the values in the LookUpTRACSActions table into the major TRACS categories.**

**MacrogroupSGCNGrouped – Query to count how many species of a taxa group are found in each habitat macrogroup. Associated forms: Macrogroups**

**MacrogroupTaxaTally – Crosstab query based on the MacrogroupSGCNGrouped query to display the total count of each taxa group in columnar format. Associated reports: MacrogroupTaxaTally**

**MacrogroupActionsGrouped – Query to count the number of habitat macrogroups to which an identified action is assigned. Associated forms: Macrogroups. Associated Reports: MacrogroupActions**

**MacrogroupThreatsActionsGrouped – Query to group state habitat threats and actions under a habitat macrogroup. Associated Reports: MacrogroupActionsSubreport, MacrogroupThreatsSubreport**

**MacrogroupThreatsGrouped – Query to count the number of habitat macrogroups to which an identified threat is assigned. Associated forms: Macrogroups. Associated Reports: MacrogroupThreats**

**MacrogroupUnassociatedActions – Query to count the number of habitat macrogroups to which an action is assigned with no identified threat. Associated forms: Macrogroups.**

**ThreatsActionsGrouped – Query to count the number of threats associated with an action or the number of actions associated with a threat. Associated forms: Actions, Threats, ActionsThreatsPopup, ThreatsActionsPopup**

**StateActionCategories – Query to tally the number of actions a state assigned to major TRACS categories. Associated reports: StateDataSummary**

**StateTaxaTally – Query to tally the number of species a state designated as SGCN in each taxa group. Associated reports: StateDataSummary**

**StateThreatCategories – Query to tally the number of threats a state assigned to major IUCN categories. Associated reports: StateDataSummary**

**Export Queries**

**Export of State Data**

**The following queries are used to export all of a state’s data contained in the database to an Excel file. These queries are executed by form StateDataTransfer. The StateDataTransfer form is accessed by selecting the “Export State Data” button on the Main form.**

**ExportActions – Query used to export a state’s Actions table data.**

**ExportHabitats – Query used to export a state’s Habitats table data.**

**ExportLocations – Query used to export a state’s Locations table data.**

**ExportSGCN – Query used to export a state’s SGCN data based on the SGCN1 and SGCN2 tables.**

**ExportSGCNHabitats – Query used to export a state’s SGCNHabitats table data.**

**ExportTaxa – Query used to export a state’s Taxa table data.**

**ExportThreats – Query used to export a state’s Threats table data.**

**ExportThreatsActions1 – Query used to export a state’s ThreatsActions1 table data.**

**ExportThreatsActions2 – Query used to export a state’s ThreatsActions2 table data.**

**Export of regional SGCN data**

**The following queries are used to export all of SGCN data to an Excel file. These queries are executed when the “Export SGCN” button on the Main form is selected.**

**ExportSpecies1 – First query called to prepare SGCN data for export.**

**ExportSpecies2 – Second query called to prepare SGCN data for export.**

**ExportMammals – Exports SGCN Mammal data to a worksheet in an Excel file. Uses query ExportSpecies2 to compile data.**

**ExportBirds – Exports SGCN Bird data to a worksheet in an Excel file. Uses query ExportSpecies2 to compile data.**

**ExportHerps – Exports SGCN Herp data to a worksheet in an Excel file. Uses query ExportSpecies2 to compile data.**

**ExportFish – Exports SGCN Fish data to a worksheet in an Excel file. Uses query ExportSpecies2 to compile data.**

**ExportArthropods – Exports SGCN Arthropod data to a worksheet in an Excel file. Uses query ExportSpecies2 to compile data.**

**ExportNonArthropods – Exports SGCN NonArthropod invertebrate data to a worksheet in an Excel file. Uses query ExportSpecies2 to compile data.**

**Create Table Queries**

**The following queries are used to create tables that are used for reporting.**

**SGCNMacrogroup1 – First query called to create the SGCNMacrogroup report table.**

**SGCNMacrogroup2 – Second query called to create the SGCNMacrogroup report table.**

**SGCNMacrogroup3 – Final query that creates the SGCNMacrogroup report table.**

**SGCNState1 – First query called to create the SGCNState report table.**

**SGCNState2 – Second query called to create the SGCNState report table.**

**SGCNState3 – Final query that creates the SGCNState report table.**

**StateHabitatTaxaTally1 – First query called to create the StateHabitatTaxaTally report table.**

**StateHabitatTaxaTally2 – Second query called to create the StateHabitatTaxaTally report table.**

**StateHabitatTaxaTally3 – Final query that creates the StateHabitatTaxaTally report table.**

**Appendix 5. Description of the forms used in the Northeast Region SWAP database.**

**Main – This form opens automatically when the database is opened.** **All other forms and reports are accessed through this form.**

**“SGCN” Button – Opens the SGCN form. The SGCN form is used to search, display, and print reports for any of the species contained in the database.**

**“Threats” Button – Opens the Threats form. The Threats form allows you to review, display, and print threats. Threats can be filtered by state, IUCN category, and threat type.**

**“Actions” Button – Opens the Actions form. The Actions form allows you to review, display, and print actions. Actions can be filtered by state, TRACS category, and action type.**

**“State Taxa” Button – Opens the Taxa form. The Taxa form allows you to review the threats and actions assigned to the taxa groups identified by the selected state.**

**“State Habitats” Button – Opens the Habitat form. The Habitat form allows you to review the different habitat types identified by states. Species, threats, and actions assigned to the habitat types can also be reviewed.**

**“Habitat Macrogroups” Button – Opens the Macrogroups form. The Macrogroups form allows you to review the species, state habitat types, threats, and actions associated with each habitat macrogroup.**

**“Export State Data” Button – Opens the StateDataTransfer form. The StateDataTransfer form is used to export all of a state’s data contained in the database to a Microsoft Excel file.**

**“Export SGCN” Button – Exports all regional species data to a Microsoft Excel file. The Excel file is placed in the same folder as the database and is named “NERegionSGCN” with the current date (e.g. NERegionSGCN-12-14-2016.xls).**

**“State Reports” Button – Opens the StateReports form. The StateReports form is used to review and print summaries of state-specific SWAP data.**

**“Update Report Tables” Button – Runs an update that creates a new SGCNMacrogroup table, a new SGCNState table and a new StateHabitatTaxaTally table. This update only needs to be run if habitat or SGCN data have been modified.**

**SGCN – This form is accessed by selecting the “SGCN” button on the Main form. It allows you to review, display, and print information related to a specific species.**

**Subforms**

**SGCNSubform1 – Displays the state-specific information for the selected species and selected state.**

**SGCNSubform2 – Displays a list of state habitat types used by the selected species in the selected state.**

**SGCNSubform3 – Displays the threats assigned to the selected species by the selected state.**

**SGCNSubform4 – Displays the actions assigned to the threat displayed in SGCNSubform3.**

**SGCNSubform5 – Displays actions assigned to the selected species in the selected state that are not associated with a specific threat.**

**Associated Forms**

**SGCNSearch – This form allows you to search for a species by its common name or scientific name. Any part of the name can be used for the search. When a search result is chosen by selecting the “Select” button, the SGCN form opens to the selected species. It is accessed by selecting the “SGCN Search” button.**

**SGCNEdit – This form allows you to edit information about the selected species. It is accessed by selecting the “Edit Species” button.**

**Associated Reports**

**RSGCN – A printable report of species designated as Regional Species of Greatest Conservation Need. It is accessed by selecting the “Print RSGCN List” button.**

**SGCNStateList – A printable report of a state’s SGCN list. It is accessed by selecting a state from the “Print State SGCN” dropdown menu.**

**SGCNThreats – A printable regional report of threats and their associated actions identified for the selected species. It is accessed by selecting the “Print Threats” button.**

**SGCNActions – A printable regional report of actions and their associated threats identified for the selected species. It is accessed by selecting the “Print Actions” button.**

**SGCNHabitats – A printable regional report of habitats identified for the selected species. It is accessed by selecting the “Print Habitats” button.**

**Threats – This form is accessed by selecting the “Threats” button on the Main form. It allows you to review, display, and print threats. Threats can be filtered by state, IUCN category, and threat type.**

**Associated Forms**

**ThreatsFiltered – Displays all threat types in table format, filtered by the selected region and IUCN categories. Activated by selecting the “Create Table” button when the threat type selected equals “All Threats”.**

**ThreatsFilteredHabitat – Displays habitat threat types in table format, filtered by the selected region and IUCN categories. Activated by selecting the “Create Table” button when the threat type selected equals “Habitat Threats”.**

**ThreatsFilteredLocation – Displays location threat types in table format, filtered by the selected region and IUCN categories. Activated by selecting the “Create Table” button when the threat type selected equals “Location Threats”.**

**ThreatsFilteredSGCN – Displays species threat types in table format filtered, by the selected region and IUCN categories. Activated by selecting the “Create Table” button when the threat type selected equals “Species Threats”.**

**ThreatsFilteredStatewide – Displays statewide threat types in table format filtered, by the selected region and IUCN categories. Activated by selecting the “Create Table” button when the threat type selected equals “Statewide Threats”.**

**ThreatsFilteredTaxa – Displays taxa threat types in table format filtered, by the selected region and IUCN categories. Activated by selecting the “Create Table” button when the threat type selected equals “Taxa Threats”.**

**ThreatsHabitatsPopup – Displays a list of habitat types associated with the selected threat. It is activated when the “Associated Habitats” label is selected.**

**ThreatsLocationPopup – Displays a list of locations associated with the selected threat. It is activated when the “Associated Locations” label is selected.**

**ThreatsSGCNPopup – Displays a list of species associated with the selected threat. It is activated when the “Associated Species” label is selected.**

**ThreatsTaxaPopup – Displays a list of taxa groups associated with the selected threat. It is activated when the “Associated Taxa” label is selected.**

**ThreatsActionsPopup – Displays a list of threats associated with the selected threat. It is activated when the “Associated Actions” label is selected.**

**Associated Reports**

**Threats – A printable formatted report of all threats, filtered by the selected region and IUCN categories. Activated by selecting the “Print” button when the threat type selected equals “All Threats”.**

**ThreatsHabitat – A printable formatted report of habitat threats, filtered by the selected region and IUCN categories. Activated by selecting the “Print” button when the threat type selected equals “Habitat Threats”.**

**ThreatsLocation – A printable formatted report of location threats, filtered by the selected region and IUCN categories. Activated by selecting the “Print” button when the threat type selected equals “Location Threats”.**

**ThreatsSGCN – A printable formatted report of species threats, by the selected region and IUCN categories. Activated by selecting the “Print” button when the threat type selected equals “Species Threats”.**

**ThreatsStatewide – A printable formatted report of statewide threats, by the selected region and IUCN categories. Activated by selecting the “Print” button when the threat type selected equals “Statewide Threats”.**

**ThreatsTaxa – A printable formatted report of taxa threats, by the selected region and IUCN categories. Activated by selecting the “Print” button when the threat type selected equals “Taxa Threats”.**

**Actions – This form is accessed by selecting the “Actions” button on the Main form. It allows you to review, display, and print actions. Actions can be filtered by state, TRACS category, and action type.**

**Associated Forms**

**ActionsFiltered – Displays all action types in table format, filtered by the selected region and TRACS categories. Activated by selecting the “Create Table” button when the action type selected equals “All Actions”.**

**ActionsFilteredHabitat – Displays habitat action types in table format, filtered by the selected region and TRACS categories. Activated by selecting the “Create Table” button when the action type selected equals “Habitat Actions”.**

**ActionsFilteredLocation – Displays location action types in table format, filtered by the selected region and TRACS categories. Activated by selecting the “Create Table” button when the action type selected equals “Location Actions”.**

**ActionsFilteredSGCN – Displays species action types in table format filtered, by the selected region and TRACS categories. Activated by selecting the “Create Table” button when the action type selected equals “Species Actions”.**

**ActionsFilteredStatewide – Displays statewide action types in table format filtered, by the selected region and TRACS categories. Activated by selecting the “Create Table” button when the action type selected equals “Statewide Actions”.**

**ActionsFilteredTaxa – Displays taxa action types in table format filtered, by the selected region and TRACS categories. Activated by selecting the “Create Table” button when the action type selected equals “Taxa Actions”.**

**ActionsHabitatsPopup – Displays a list of habitat types associated with the selected action. It is activated when the “Associated Habitats” label is selected.**

**ActionsLocationPopup – Displays a list of locations associated with the selected action. It is activated when the “Associated Locations” label is selected.**

**ActionsSGCNPopup – Displays a list of species associated with the selected action. It is activated when the “Associated Species” label is selected.**

**ActionsTaxaPopup – Displays a list of taxa groups associated with the selected action. It is activated when the “Associated Taxa” label is selected.**

**ActionsThreatsPopup – Displays a list of threats associated with the selected action. It is activated when the “Associated Threats” label is selected.**

**Associated Reports**

**Actions – A printable formatted report of all actions, filtered by the selected region and TRACS categories. Activated by selecting the “Print” button when the action type selected equals “All Actions”.**

**ActionsHabitat – A printable formatted report of habitat actions, filtered by the selected region and TRACS categories. Activated by selecting the “Print” button when the action type selected equals “Habitat Actions”.**

**ActionsLocation – A printable formatted report of location actions, filtered by the selected region and TRACS categories. Activated by selecting the “Print” button when the action type selected equals “Location Actions”.**

**ActionsSGCN – A printable formatted report of species actions, by the selected region and TRACS categories. Activated by selecting the “Print” button when the action type selected equals “Species Actions”.**

**ActionsStatewide – A printable formatted report of statewide actions, by the selected region and TRACS categories. Activated by selecting the “Print” button when the action type selected equals “Statewide Actions”.**

**ActionsTaxa – A printable formatted report of taxa actions, by the selected region and TRACS categories. Activated by selecting the “Print” button when the action type selected equals “Taxa Actions”.**

**Habitat – This form is accessed by selecting the “State Habitats” button on the Main form. It allows you to review the different habitat types identified by states. Species, threats, and actions assigned to the habitat types can also be reviewed.**

**Subforms**

**HabitatSubform1 – Displays the threats assigned to the selected habitat type.**

**HabitatSubform2 – Displays the actions assigned to the threat displayed in HabitatSubform1.**

**HabitatSubform3 – Displays actions assigned to the selected habitat that are not associated with a specific threat.**

**Associated Reports**

**HabitatThreats – A printable report of habitat threats and the classification of each threat. Activated by selecting the “Print Threats” button.**

**HabitatThreatsActions – A printable report of habitat threats, assigned actions and the classification of each action. Activated by selecting the “Print Actions” button.**

**HabitatSGCN – A printable report of the species that occur in the habitat type. Activated by selecting the “Print Species” button.**

**StateHabitatTaxaTally – A printable report of the number of species in major taxa that occur in each habitat type. Activated by selecting the “Print State Habitat Taxa Tally” button.**

**Macrogroups – This form is accessed by selecting the “Habitat Macrogroups” button on the Main form. It allows you to review the species, state habitat types, threats, and actions associated with each habitat macrogroup.**

**Subforms**

**MacrogroupsSubform1 – Displays the state habitat types that are assigned to the selected macrogroup.**

**MacrogroupsSubform2 – Displays the threats to state habitat types assigned to the selected macrogroup.**

**MacrogroupsSubform3 – Displays the actions assigned to the threat displayed in MacrogroupsSubform2.**

**MacrogroupsSubform4 – Displays actions assigned to state habitat types assigned to the macrogroup that are not associated with a specific threat.**

**Associated Reports**

**MacrogroupSGCN – A printable report of the species that are found in the selected habitat macrogroup. Activated by selecting a choice from the “Print Associated SGCN” dropdown menu.**

**MacrogroupStateHabitats – A printable report of the state habitat types that have been assigned to the selected habitat macrogroup. Activated by selecting the “Print Macrogroup State Habitat List” button.**

**MacrogroupTaxaTally – A printable report of the number of species in major taxa groups that are found in each habitat macrogroup. Activated by selecting the “Print Macrogroup Taxa Tally” button.**

**MacrogroupThreats – A printable report of state identified threats associated with the selected habitat macrogroup, grouped by IUCN category. Activated by selecting the “Print Actions” button.**

**MacrogroupActions – A printable report of state identified actions associated with the selected habitat macrogroup, grouped by TRACS category. Activated by selecting the “Print Actions” button.**

**Taxa – This form is accessed by selecting the “State Taxa” button on the Main form. It allows you to review the threats and actions assigned to the taxa groups identified by the selected state.**

**Subforms**

**TaxaSubform1 – Displays the threats assigned to the selected taxa group.**

**TaxaSubform2 – Displays the actions assigned to the threat displayed in TaxaSubform1.**

**TaxaSubform3 – Displays actions assigned to the selected taxa group that are not associated with a specific threat.**

**Associated Reports**

**TaxaThreats – A printable report of taxa threats and the classification of each threat. Activated by selecting the “Print Threats” button.**

**TaxaThreatsActions – A printable report of taxa threats, assigned actions and the classification of each action. Activated by selecting the “Print Actions” button.**

**StateDataTransfer – This form is used to export all of a state’s data contained in the database to a Microsoft Excel file. The form is accessed by selecting the “Export State Data” button on the Main form. The Excel file is placed in the same folder as the database and is named with the state’s abbreviation and the current date (e.g. CT-SWAPData-12-14-2016.xls).**

**StateReports – This form is used to review and print summaries of state-specific SWAP data. The form is accessed by selecting the “State Reports” button on the Main form.**

**Associated Reports**

**StateDataSummary – A printable summary report of a state’s SWAP data. It is accessed by selecting the “State Data Summary” button after selecting a state from the “Select State” dropdown menu.**

**SGCNStateList – A printable report of a state’s SGCN list. It is accessed by selecting the “SGCN List” button after selecting a state from the “Select State” dropdown menu.**

**StateHabitatTaxaTally – A printable report of the number of species in major taxa that occur in each state habitat type. It is accessed by selecting the “Habitat Taxa Tally” button after selecting a state from the “Select State” dropdown menu.**

**StateActionsHabitat – A printable report of actions and their associated threats that a state assigned to habitat types. It is accessed by selecting the “Habitat Actions” button after selecting a state from the “Select State” dropdown menu.**

**StateActionsLocation – A printable report of actions and their associated threats that a state assigned to locations. It is accessed by selecting the “Location Actions” button after selecting a state from the “Select State” dropdown menu.**

**StateActionsSGCN – A printable report of actions and their associated threats that a state assigned to individual species. It is accessed by selecting the “SGCN Actions” button after selecting a state from the “Select State” dropdown menu.**

**StateActionsStatewide – A printable report of actions and their associated threats that a state considered statewide. It is accessed by selecting the “Statewide Actions” button after selecting a state from the “Select State” dropdown menu.**

**StateActionsTaxa – A printable report of actions and their associated threats that a state assigned to taxa groups. It is accessed by selecting the “Taxa Actions” button after selecting a state from the “Select State” dropdown menu.**

**StateThreatsHabitat – A printable report of threats and their associated actions that a state assigned to habitat types. It is accessed by selecting the “Habitat Threats” button after selecting a state from the “Select State” dropdown menu.**

**StateThreatsLocation – A printable report of threats and their associated actions that a state assigned to locations. It is accessed by selecting the “Location Threats” button after selecting a state from the “Select State” dropdown menu.**

**StateThreatsSGCN – A printable report of threats and their associated actions that a state assigned to individual species. It is accessed by selecting the “SGCN Threats” button after selecting a state from the “Select State” dropdown menu.**

**StateThreatsStatewide – A printable report of threats and their associated actions that a state considered statewide. It is accessed by selecting the “Statewide Threats” button after selecting a state from the “Select State” dropdown menu.**

**StateThreatsTaxa– A printable report of threats and their associated actions that a state assigned to taxa groups. It is accessed by selecting the “Taxa Threats” button after selecting a state from the “Select State” dropdown menu.**

**Appendix 6. Description of the reports used in the Northeast Region SWAP database.**

**Actions – A printable formatted report of all actions, filtered by the selected region and TRACS categories. It is accessed on the Actions form by selecting the “Print” button when the action type selected equals “All Actions”.**

**Subreports**

**ActionsSubreport – Prints the threats associated with the listed action.**

**ActionsHabitat – A printable formatted report of habitat actions, filtered by the selected region and TRACS categories. It is accessed on the Actions form by selecting the “Print” button when the action type selected equals “Habitat Actions”.**

**Subreports**

**ActionsHabitatSubreport – Prints the threats associated with the listed action.**

**ActionsLocation – A printable formatted report of location actions, filtered by the selected region and TRACS categories. It is accessed on the Actions form by selecting the “Print” button when the action type selected equals “Location Actions”.**

**Subreports**

**ActionsLocationSubreport – Prints the threats associated with the listed action.**

**ActionsSGCN – A printable formatted report of species actions, by the selected region and TRACS categories. It is accessed on the Actions form by selecting the “Print” button when the action type selected equals “Species Actions”.**

**Subreports**

**ActionsSGCNSubreport – Prints the threats associated with the listed action.**

**ActionsStatewide – A printable formatted report of statewide actions, by the selected region and TRACS categories. It is accessed on the Actions form by selecting the “Print” button when the action type selected equals “Statewide Actions”.**

**Subreports**

**ActionsStatewideSubreport – Prints the threats associated with the listed action.**

**ActionsTaxa – A printable formatted report of taxa actions, by the selected region and TRACS categories. It is accessed on the Actions form by selecting the “Print” button when the action type selected equals “Taxa Actions”.**

**Subreports**

**ActionsTaxaSubreport – Prints the threats associated with the listed action.**

**HabitatSGCN – A printable report of the species that occur in the habitat type. It is accessed on the Habitat form by selecting the “Print Species” button.**

**HabitatThreats – A printable report of habitat threats and the classification of each threat. It is accessed on the Habitat form by selecting the “Print Threats” button.**

**HabitatThreatsActions – A printable report of habitat threats, assigned actions and the classification of each action. It is accessed on the Habitat form by selecting the “Print Actions” button.**

**Subreports**

**HabitatThreatsActionsSubreport – Prints the actions associated with the listed threat.**

**MacrogroupActions – A printable report of state identified actions associated with the selected habitat macrogroup, grouped by TRACS category. It is accessed on the Macrogroup form by selecting the “Print Actions” button.**

**Subreports**

**MacrogroupActionsSubreport – Prints the threats associated with the listed action.**

**MacrogroupSGCN – A printable report of the species that are found in the selected habitat macrogroup. It is accessed on the Macrogroup form by selecting a choice from the “Print Associated SGCN” dropdown menu.**

**Subreports**

**MacrogroupSGCNsubreport – Prints the associated species in two column format.**

**MacrogroupStateHabitats – A printable report of the state habitat types that have been assigned to the selected habitat macrogroup. It is accessed on the Macrogroup form by selecting the “Print Macrogroup State Habitat List” button.**

**Subreports**

**MacrogroupStateHabitatsSubreport – Prints a complete list of the habitat macrogroups used in the database on the last page of the report..**

**MacrogroupTaxaTally – A printable report of the number of species in major taxa groups that are found in each habitat macrogroup. It is accessed on the Macrogroup form by selecting the “Print Macrogroup Taxa Tally” button.**

**MacrogroupThreats – A printable report of state identified threats associated with the selected habitat macrogroup, grouped by IUCN category. It is accessed on the Macrogroup form by selecting the “Print Threats” button.**

**Subreports**

**MacrogroupThreatsSubreport – Prints the actions associated with the listed threat.**

**RSGCN – A printable report of all regional species of greatest conservation need. It is accessed on the SGCN form by selecting the “Print RSGCN List” button.**

**SGCNActions – A printable regional report of actions and their associated threats identified for the selected species. It is accessed on the SGCN form by selecting the “Print Actions” button.**

**Subreports**

**SGCNActionsSubreport – Prints the threats associated with the listed action.**

**SGCNHabitats – A printable regional report of habitats identified for the selected species. It is accessed on the SGCN form by selecting the “Print Habitats” button.**

**SGCNThreats – A printable regional report of threats and their associated actions identified for the selected species. It is accessed on the SGCN form by selecting the “Print Threats” button.**

**Subreports**

**SGCNThreatsSubreport – Prints the actions associated with the listed threat.**

**SGCNStateList – A printable report of a state’s SGCN list. It is accessed on the SGCN form by selecting a state from the “Print State SGCN” dropdown menu or by selecting the “SGCN List” button on the StateReports form.**

**StateHabitatTaxaTally – A printable report of the number of species in major taxa that occur in each habitat type. It is accessed on the Habitat form by selecting the “Print State Habitat Taxa Tally” button or by selecting the “Habitat Taxa Tally” button on the StateReports form.**

**StateSGCNInfo – A printable report of state information for the selected species. It is accessed on the SGCN form by selecting the “Print State Info” button.**

**Subreports**

**StateInfoSubreport1 – Prints the state habitats associated with the listed species.**

**StateInfoSubreport2 – Prints the state threats associated with the listed species.**

**StateInfoSubreport3 – Prints the state actions associated with the threats to the listed species.**

**StateInfoSubreport4 – Prints any state actions assigned to the listed species but not associated with a specific threat.**

**TaxaThreats – A printable report of taxa threats and the classification of each threat. It is accessed on the Taxa form by selecting the “Print Threats” button.**

**TaxaThreatsActions – A printable report of taxa threats, assigned actions and the classification of each action. It is accessed on the Taxa form by selecting the “Print Actions” button.**

**Subreports**

**TaxaThreatsActionsSubreport – Prints the actions associated with the listed threat.**

**Threats – A printable formatted report of all threats, filtered by the selected region and IUCN categories. It is accessed on the Threats form by selecting the “Print” button when the threat type selected equals “All Threats”.**

**Subreports**

**ThreatsSubreport – Prints the actions associated with the listed threat.**

**ThreatsHabitat – A printable formatted report of habitat threats, filtered by the selected region and IUCN categories. It is accessed on the Threats form by selecting the “Print” button when the threat type selected equals “Habitat Threats”.**

**Subreports**

**ThreatsHabitatSubreport – Prints the actions associated with the listed threat.**

**ThreatsLocation – A printable formatted report of location threats, filtered by the selected region and IUCN categories. It is accessed on the Threats form by selecting the “Print” button when the threat type selected equals “Location Threats”.**

**Subreports**

**ThreatsLocationSubreport – Prints the actions associated with the listed threat.**

**ThreatsSGCN – A printable formatted report of species threats, by the selected region and IUCN categories. It is accessed on the Threats form by selecting the “Print” button when the threat type selected equals “Species Threats”.**

**Subreports**

**ThreatsSGCNSubreport – Prints the actions associated with the listed threat.**

**ThreatsStatewide – A printable formatted report of statewide threats, by the selected region and IUCN categories. It is accessed on the Threats form by selecting the “Print” button when the threat type selected equals “Statewide Threats”.**

**Subreports**

**ThreatsStatewideSubreport – Prints the actions associated with the listed threat.**

**ThreatsTaxa – A printable formatted report of taxa threats, by the selected region and IUCN categories. It is accessed on the Threats form by selecting the “Print” button when the threat type selected equals “Taxa Threats”.**

**Subreports**

**ThreatsTaxaSubreport – Prints the actions associated with the listed threat.**

**StateDataSummary – A printable summary report of a state’s SWAP data. It is accessed on the StateReports form by selecting the “State Data Summary” button after selecting a state from the “Select State” dropdown menu.**

**StateActionsHabitat – A printable report of actions and their associated threats that a state assigned to habitat types. It is accessed on the StateReports form by selecting the “Habitat Actions” button after selecting a state from the “Select State” dropdown menu.**

**StateActionsLocation – A printable report of actions and their associated threats that a state assigned to locations. It is accessed on the StateReports form by selecting the “Location Actions” button after selecting a state from the “Select State” dropdown menu.**

**StateActionsSGCN – A printable report of actions and their associated threats that a state assigned to individual species. It is accessed on the StateReports form by selecting the “SGCN Actions” button after selecting a state from the “Select State” dropdown menu.**

**StateActionsStatewide – A printable report of actions and their associated threats that a state considered statewide. It is accessed on the StateReports form by selecting the “Statewide Actions” button after selecting a state from the “Select State” dropdown menu.**

**StateActionsTaxa – A printable report of actions and their associated threats that a state assigned to taxa groups. It is accessed on the StateReports form by selecting the “Taxa Actions” button after selecting a state from the “Select State” dropdown menu.**

**StateThreatsHabitat – A printable report of threats and their associated actions that a state assigned to habitat types. It is accessed on the StateReports form by selecting the “Habitat Threats” button after selecting a state from the “Select State” dropdown menu.**

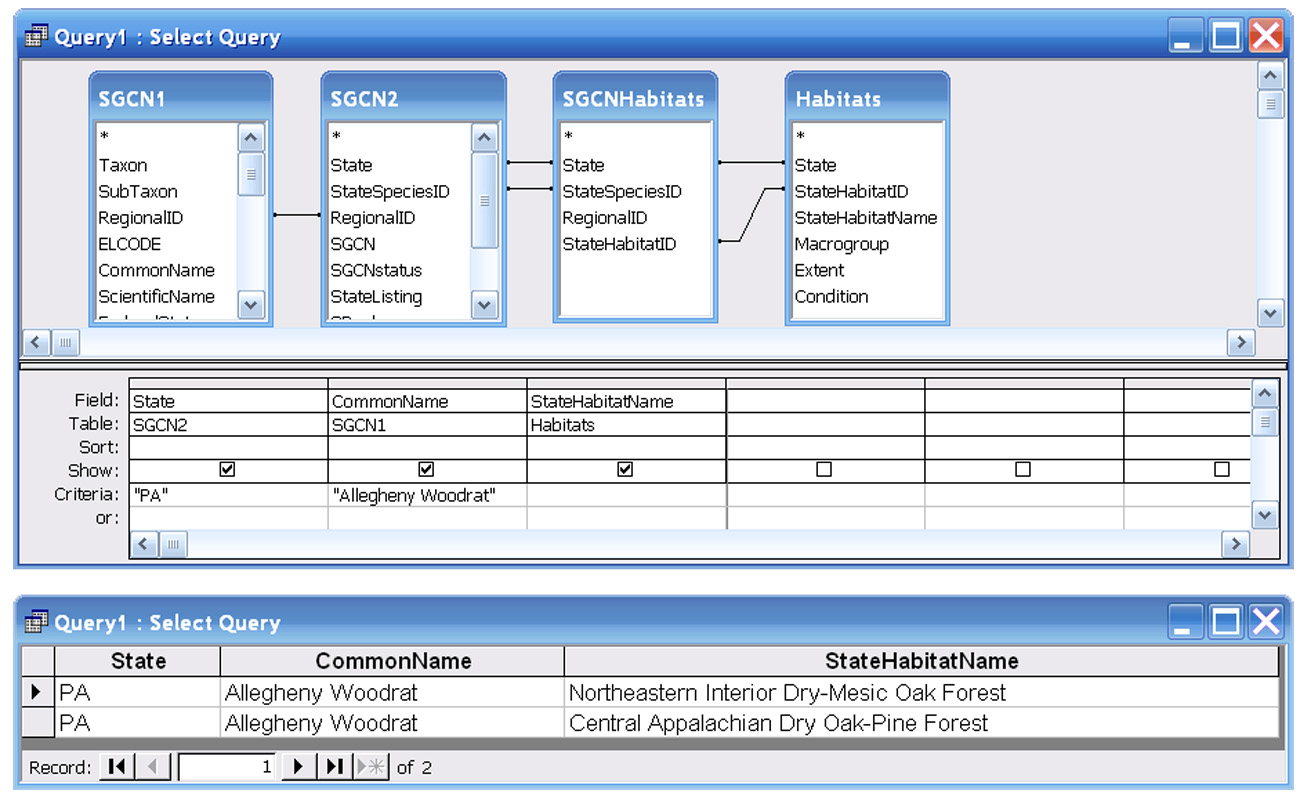
**StateThreatsLocation – A printable report of threats and their associated actions that a state assigned to locations. It is accessed on the StateReports form by selecting the “Location Threats” button after selecting a state from the “Select State” dropdown menu.**

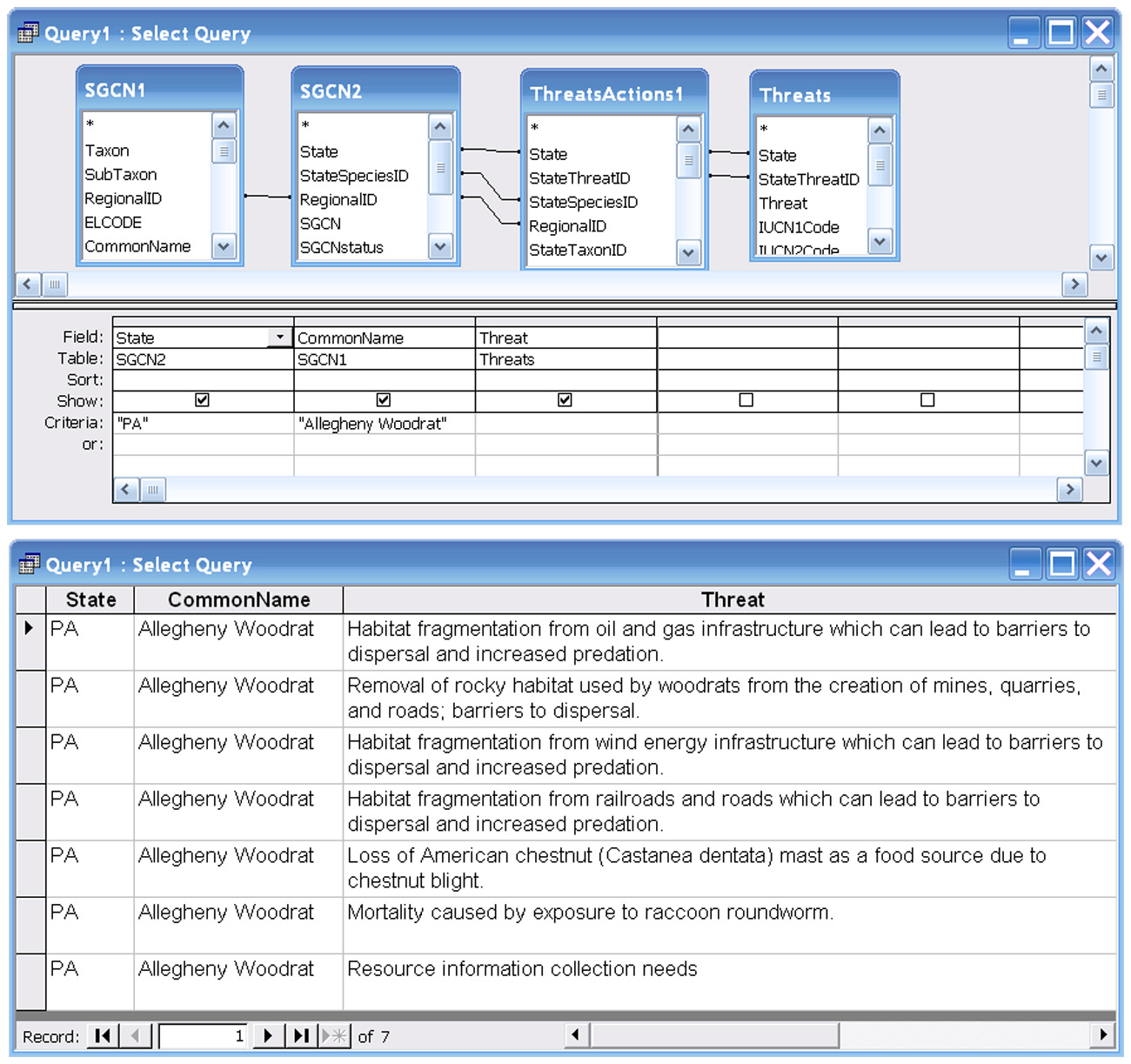
**StateThreatsSGCN – A printable report of threats and their associated actions that a state assigned to individual species. It is accessed on the StateReports form by selecting the “SGCN Threats” button after selecting a state from the “Select State” dropdown menu.**

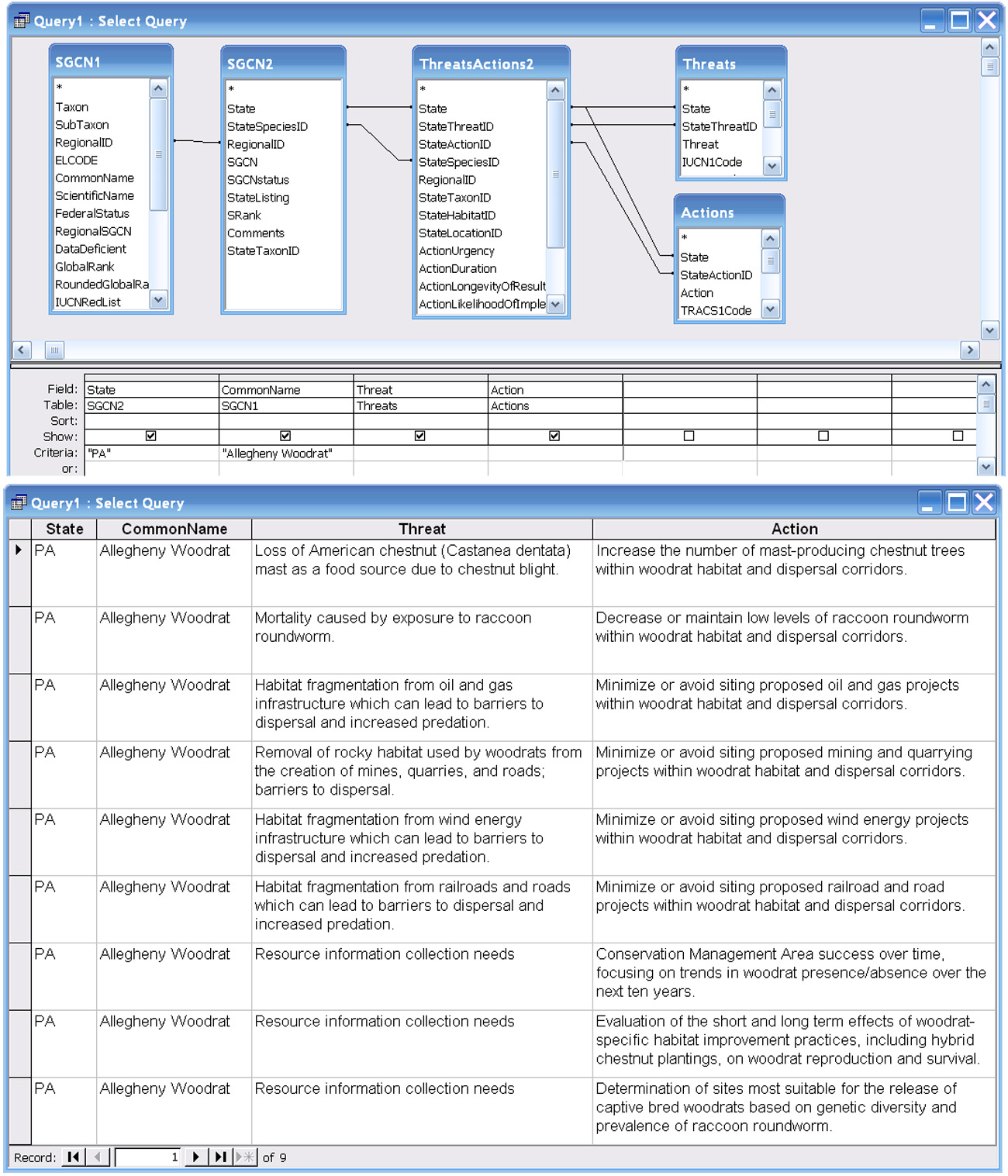
**StateThreatsStatewide – A printable report of threats and their associated actions that a state considered statewide. It is accessed on the StateReports form by selecting the “Statewide Threats” button after selecting a state from the “Select State” dropdown menu.**

**StateThreatsTaxa– A printable report of threats and their associated actions that a state assigned to taxa groups. It is accessed on the StateReports form by selecting the “Taxa Threats” button after selecting a state from the “Select State” dropdown menu.**

**Appendix 7. Examples of the relational linkages among data tables used in the Northeast Region SWAP database. This relational data structure provides the ability to query, analyze, export, and report state wildlife action plan data in a variety of format.**

**Figure 7-1. Example query design and results showing the habitats used by the Allegheny Woodrat in Pennsylvania.**

**Figure 7-2. Example query design and results showing the Identified Threats assigned to the Allegheny Woodrat in Pennsylvania.**

**Figure 7-3. Example query design and results showing the Actions assigned to the Threats assigned to the Allegheny Woodrat in Pennsylvania.**

**Appendix 8- Approach to database design**

Basic Database Design

The following steps were taken to design the database:

Create Primary Data Tables

Data tables were created to respond to the priorities identified by states. State SWAP Coordinators and NEFWDTC members were surveyed to identify which key data fields were priorities of SWAP Elements 1-5. These results, as well as the NE Lexicon, were used to identify which key tables, data content and format were needed. More detailed information on these tables is found in Appendix 2, and basic examples are provided for each table below.

1-Develop a table of Species and assign each a unique ID. Example:

|  |  |  |
| --- | --- | --- |
| **SpeciesID** | **CommonName** | **ScientificName** |
| A1 | Fowler's Toad | Anaxyrus fowleri |
| A2 | Marbled Salamander | Ambystoma opacum |
| A3 | Pine Barrens Treefrog | Hyla andersonii |
| B1 | American Bittern | Botaurus lentiginosus |
| B2 |  |  |
| B3 |  |  |
| … | … | … |

2-Develop a table of Habitats and assign each a unique ID. Example:

|  |  |
| --- | --- |
| **HabitatID** | **HabitatName** |
| H1 |  |
| H2 |  |
| H3 |  |
| H4 |  |
| H5 |  |
| H6 |  |
| … | … |

3-(*Optional*) Develop a table of Taxa groups and assign each a unique ID. Example:

|  |  |
| --- | --- |
| **TaxonID** | **TaxaGroupName** |
| G1 | Bats |
| G2 | Grassland Birds |
| G3 | Freshwater Fish |
| … | … |

4-(*Optional*) Develop a table of Locations and assign each a unique ID. Example:

|  |  |
| --- | --- |
| **LocationID** | **LocationName** |
| L1 | North Branch Potomac |
| L2 | South Branch Potomac |
| L3 | North Fork Shenandoah |
| … | … |

5-Develop a table of Threats and assign each a unique ID. Use IUCN codes to categorize each Threat. Example:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ThreatID** | **Threat** | **IUCN1** | **IUCN2** | **IUCN3** |
| T1 |  |  |  |  |
| T2 |  |  |  |  |
| T3 |  |  |  |  |
| T4 |  |  |  |  |
| T5 |  |  |  |  |
| T6 |  |  |  |  |
| … | … |  |  | … |

6-Develop a table of Actions and assign each a unique ID. Use TRACS codes to categorize each Action. Example:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ActionID** | **Action** | **TRACS1** | **TRACS 2** | **TRACS3** |
| A1 |  |  |  |  |
| A2 |  |  |  |  |
| A3 |  |  |  |  |
| A4 |  |  |  |  |
| A5 |  |  |  |  |
| A6 |  |  |  |  |
| … | … |  |  | … |

Establish Data Relationships

Once tables were created and designed, certain tables needed to be linked to each other in the most meaningful ways. States identified which queries were most important to them, so that helped to guide the relationship design. The following steps and links were created to produce the most functional relational structure:

**Species/Habitat Use** – Create a table establishing the relationship of each species to different habitat types using the unique species and habitat IDs. Example:

|  |  |
| --- | --- |
| **SpeciesID** | **HabitatID** |
| A1 | H1 |
| A1 | H3 |
| A1 | H4 |
| B1 | H1 |
| B1 | H7 |
| B2 | H7 |
| … | … |

**Assign Threats to Species** – Create a table assigning threats to species using the unique species and threat IDs. Classify each assigned threat according to the Northeast Regional SWAP Lexicon. Example:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **SpeciesID** | **ThreatID** | **Severity** | **Reversibility** | **Immediacy** | **Spatial Extent** | **Certainty** | **Likelihood** |
| A1 |  |  |  |  |  |  |  |
| A1 |  |  |  |  |  |  |  |
| A1 |  |  |  |  |  |  |  |
| B1 |  |  |  |  |  |  |  |
| B1 |  |  |  |  |  |  |  |
| B2 |  |  |  |  |  |  |  |
| … |  |  |  | … |  |  |  |

**Assign Actions to Species Threats** – Create a table assigning actions to each species threat using unique species, threat, and action IDs. Classify each assigned action according to the Northeast Regional SWAP Lexicon. Example:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **SpeciesID** | **ThreatID** | **ActionID** | **Urgency** | **Duration** | **Longevity of Results** | **Likelihood of Implementation** | **Likelihood of Success** | **Estimated Cost** |
| A1 |  |  |  |  |  |  |  |  |
| A1 |  |  |  |  |  |  |  |  |
| A1 |  |  |  |  |  |  |  |  |
| B1 |  |  |  |  |  |  |  |  |
| B1 |  |  |  |  |  |  |  |  |
| B2 |  |  |  |  |  |  |  |  |
| … |  |  |  |  | … |  |  |  |

Once the tables and relationships were created, the data could be sorted and reported in multiple ways.