**Table 2. Matrix of Actions, Projects, Priority Needs, Next Steps and Responsibility**

**Bolded items under regional projects identify additional projects underway to address needs**; *italicized items under potential next steps indicate steps that are being acted on*.

| **LCC Compo-nent** | **Action** | **Regional Projects Completed or Underway** | **Northeast Workshop Overall High Priorities** | **RCN Topics/LCC Science Need Priorities** | **Potential Next Steps** | **Responsibility** |
| --- | --- | --- | --- | --- | --- | --- |
| Ecological Planning | Action 1: Develop and maintain lists of priority species and natural communities | USFWS: Federal Trust Species lists;  States: Individual State SGCN lists; NEAFWA Terrestrial and Aquatic Habitat Classifications; NEAFWA high concern, high responsibility species  **NALCC/NEAFWA: through regional SWAP synthesis, identified regional species of highest responsibility & concern** | •Support development of SWAP database to promote consistency in next generation of SWAPs | RCN Topic 2: Identify High Priority NE Species of Greatest Conservation Need (invertebrates) | •Make compiled lists and tables available online | LCC staff can post on website |
| Action 2: Identify representative species | USFWS: Representative Species Process for North Atlantic LCC geographic area  **NALCC: selecting subset of representative species for species-habitat modeling in Designing Sustainable Landscapes**  **NALCC: contributing to regional U.S. FWS conservation science team that is coordinating work to refine representative species including Appalachian, Great Lakes aquatic species** |  |  | •*Additional work on selecting aquatic species* | USFWS with partners |
| Action 3: Compile and develop population objectives | USFWS: Compiled lists from existing migratory bird, fisheries and endangered species recovery plans; States: State Wildlife Action Plans (SWAPS)  **NALCC: contributing to pilot effort of ACJV to develop regional population objectives for migratory birds; initiating effort to identify LCC conservation targets (including population objectives)** | • In new SWAPs recommend adopting consistent format to allow region-wide roll up (including population targets) for establishing goals;  • Develop a process to develop regional representative species goals.  •Support development of SWAP database to promote consistency in next generation of SWAPs |  | •*Support compilation of SWAP objectives as part of SWAP database;*  *•Develop process for developing or refining goals* | Joint effort of LCC and NEAFWA? |
| Action 4: Compile info. on threats and limiting factors | RCN: Identifying relationships between invasive species and Species of Greatest Conservation Need in the Northeast region (RCN 2007-3)  **NALCC: Assessing habitat limiting factors as part of habitat capability modeling for representative species in Designing Sustainable Landscapes project; NALCC detail and summary paper on climate change and environmental contaminants.**  **States: Synthesis of threats as part of SWAP synthesis.**  **RCN: addressing threats and limiting factors for individual SGCN.** |  | RCN Topic 3: Identify NE Species of Greatest Conservation Need Data Gaps, Design Data Collection Protocols, and Collect Data  NALCC: Adaptive Management Frameworks for Representative Species | •*Continue initial efforts on representative species modeling;*  *•RCN support for addressing SGCN data gaps* | Initial modeling efforts through UMass and UVM; SGCN work through NEAFWA RCN |
| Action 5: Conduct climate change vulnerability assessments | RCN: Assessing the Likely Impacts of Climate Change on Northeastern Fish and Wildlife Habitats and Species of Greatest Conservation Need (RCN 2009-1);  NALCC: **supporting projects to assess vulnerability of habitats (phase 2 of Manomet RCN project), high priority and representative species (NatureServe), reptiles and amphibians (PARCA project), salmonids (USGS forecasting change in aquatic systems) and coastal ecosystems (Virginia Tech and USGS sea level rise projects and Structured Decision Making for Sea Level Rise)** | • Better information/tools on assessing sea level rise impacts on species and marsh management | NALCC: General vulnerability assessments to northeastern fish and wildlife habitats and species | *•Continue joint RCN/LCC vulnerability assessment project of Manomet and NatureServe* | LCC, NEAFWA, Manomet, NatureServe |
| Specific vulnerability assessments of northeastern amphibians and reptiles | *•Support NEPARC PARCA and vulnerability assessment project* | LCC, NEPARC |
| NALCC: Specific vulnerability assessments of cold water stream habitats and species including brook trout | *•Additional support for brook trout and other cold water vulnerability assessments incorporating EBTJV needs* | USGS Science Center support, Coordination with ongoing projects and EBTJV |
| NALCC: Vulnerability of coastal wetlands and beaches to sea level rise and other anthropogenic stressors | *•Assess current state of sea level rise data and tools for predicting impacts to coastal habitats; determine gaps and needs.* | LCC working with NOAA, NPS, USGS, EPA, and state CZMs |
| Action 6: Develop and apply models | NALCC: Designing Sustainable Landscapes for Wildlife: forecasting changes to landscapes, habitats and species & development of decision support tools (NALCC 2010);  NALCC: Forecast effects of sea level rise on habitat of piping plovers & identify responsive conservation strategies (NALCC 2010);  NALCC: Forecasting changes in aquatic systems and resilience of aquatic populations (NALCC 2010)  **NALCC: marine bird mapping and modeling (NALCC 2011)**  **NALCC: reptile and amphibian modeling through PARCA project (NALCC 2011);**  **American Black Duck breeding model as part of Designing Sustainable Landscapes; fish habitat database and models (NALCC 2012)** |  | NALCC: Species-habitat modeling and mapping of aquatic species;  NALCC: Species-habitat modeling and mapping of terrestrial and wetland species | •Complete ongoing terrestrial, aquatic and coastal projects | LCC |
| NALCC: Adaptive Management Frameworks for Representative Species | •Support Adaptive Management Framework for American Black Duck | LCC, BDJV |
| Action 7: Determine immediate priorities (triage) |  |  | RCN Topic 7: Identify and Assess Threats to NE Species of Greatest Conservation Need | •Assess LCC and RCN role on as needed basis | LCC, NEAFWA |
| Conserva-tion Design | Strategy 1: Assess decision support needs | **NALCC: hosted decision maker workshops for Designing Sustainable Landscapes (NALCC 2010&2012) and Forecasting changes in aquatic systems (NALCC 2010)** |  |  | •Ensure that all projects have links to and input from conservation decision-makers. | LCC |
| Action 2: Develop regional, consistent, spatial databases | RCN: Creation of Regional Habitat Cover Maps: Application of the NE Terrestrial Habitat Classification System (RCN 2007-1)  RCN: An interactive, GIS-based application to estimate continuous, unimpacted daily streamflow at ungaged locations in the Connecticut River Basin (RCN 2007-6) RCN: Instream Flow for Great Lakes Basin of NY and PA (RCN 2010-2)  DD: Northeast Aquatic Classification and Mapping/Northeast Aquatic Habitat Classification System (Doris Duke)  DD: Northeast Terrestrial Habitat Classification System (Doris Duke)  DD: Secured Lands of the Northeast (Doris Duke 2007)  **NALCC: compiling regional datasets, including for purposes of regional SWAP synthesis and by hiring/co-funding GIS analysts to make regional data more accessible and useful.**  **NALCC: supported modification of Northeast Terrestrial Habitat Map for Virginia portion and (with NE Climate Science Center) supporting extension of map to Canada (NALCC 2011, 2012).**  **NALCC: Designing Sustainable Landscapes project is compiling and creating regionally consistent datasets (NALCC 2010, 2012).**  **NALCC: other projects include coastal classification and marine bird mapping.** | • Finish mapping all systems (Canada, lakes);  • Usable product (expectations, limits);  • Mapping accuracy and validation;  • Layers (land use, threats, refugia, invasives);  • Create distribution maps for regional responsibility/high concern species  •Better aquatic temperature data/classification | RCN Topic 1: Develop Regional Base Maps for Analyses of NE SGCN Data (marine); | •*RCN or LCC support for marine mapping* | NEAFWA, LCC |
| NALCC: Habitat mapping and modeling at NALCC scale | •*Consider expansions of consistent data layers into Canada* | LCC with Canadian partners |
| NALCC: Habitat mapping and modeling of marine bird distributions and coastal migration of birds and bats | •*Work with North Atlantic Marine Bird Cooperative to assess priorities* | LCC, USFWS, ACJV |
| NALCC: Managed Lands Database Development | •Work with ACJV on proposal for database | LCC, ACJV |
| NALCC: Consistent/updated secured lands database | •Ensure incorporation of information from National Conservation Easement Database into Northeast Secure Lands Database (TNC) | LCC, TNC |
|  | Assess needs for consistent data layers on stream temperature and hydrology | LCC, USGS |
| Action 3: Assess the existing habitat capacity | RCN: Geospatial Condition Analysis of Northeast Habitats Based on the Northeast SGCN Habitat Maps (RCN 2009-2)  RCN: The Conservation Status of Key Habitats and Species of Greatest Conservation Need in the Eastern Region (RCN 2007-5)  **NALCC: Designing Sustainable Landscapes project is assessing habitat capacity and climate suitability for a set of representative species (NALCC 2010).**  **NALCC: Compiling and synthesizing high concern/high responsibility species locations as part of regional synthesis** | • Create distribution maps for regional responsibility/high concern species. | NALCC: Assessment of forest condition and management | •Complete first phase of representative species-habitat modeling including distribution maps; •Consider more detailed status assessments of habitats based on results of RCN Conservation Status Report | LCC, NEAFWA |
| Action 4: Determine habitat objectives | NALCC: Designing Sustainable Landscapes for Wildlife: forecasting changes to landscapes, habitats and species & development of decision support tools (NALCC 2010); |  |  | •*Complete first phase of representative species-habitat modeling* | LCC |
| Action 5: Predict landscape change and future capacity | NALCC: Designing Sustainable Landscapes for Wildlife: forecasting changes to landscapes, habitats and species & development of decision support tools (NALCC 2010);  NALCC: Forecast effects of sea level rise on habitat of piping plovers & identify responsive conservation strategies (NALCC 2010);  NALCC: Forecasting changes in aquatic systems and resilience of aquatic populations (NALCC 2010) | • Better information/tools on assessing sea level rise impacts on species and marsh management | NALCC: Climate model downscaling | •Complete first phase of three LCC landscape change projects;  •*Identify additional needs for Climate Science Center* | LCC, CSC |
| Action 6: Develop decision-support tools | RCN: Northeast Regional Connectivity Assessment Project (RCN 2007-2)  RCN: Proposal to Establish a Regional Initiative for Biomass Energy Development For Early-Succession SGCN in the Northeast (RCN 2007-7)  RCN: An Interactive, GIS-based Application to Estimate Target Fish Communities in Northeastern Streams (RCN 2008-1)  NALCC: Forecasting changes in aquatic systems and resilience of aquatic populations (NALCC 2010) NALCC: Forecast effects of sea level rise on habitat of piping plovers & identify responsive conservation strategies (NALCC 2010);  NALCC: Designing Sustainable Landscapes for Wildlife: forecasting changes to landscapes, habitats and species & development of decision support tools (NALCC 2010); **Conducting workshops with decision makers** | •Working with implementers/users, translate the information into usable tools |  | •*Complete first phase of three LCC landscape change projects;*  *•Involve user groups in ongoing or completed projects* | LCC, NEAFWA |
| Action 7: Assess protected and managed lands | DD: Northeast Secured Lands(Doris Duke)  RCN: Geospatial Condition Analysis of Northeast Habitats Based on the Northeast SGCN Habitat Maps (RCN 2009-2)  RCN: The Conservation Status of Key Habitats and Species of Greatest Conservation Need in the Eastern Region (RCN 2007-5) |  | NALCC: Assessment of forest condition and management  NALCC: Consistent/updated secured lands database | •Consider additional forest condition analysis | LCC |
| Action 8: Develop landscape designs | RCN: Regional Focal Areas Site Adaptive Capacity, Network Resilience and Connectivity (RCN 2008-3)  RCN: Identification of Tidal Marsh Bird Focal Areas BCR 30 (RCN 2010-3)  NALCC: Designing Sustainable Landscapes for Wildlife: forecasting changes to landscapes, habitats and species & development of decision support tools (NALCC 2010);  **NALCC: project to identify Priority Amphibian and Reptile Conservation Areas (NALCC 2011);**  **Regional synthesis of species and habitat data and focus areas as part of SWAP synthesis.**  **Permeable landscapes (NALCC 2011)** | • Identification of habitat focus areas with a step up step down (regional to local) process to implement on-the-ground habitat conservation, restoration, and management;  • Development of habitat focus areas and corridors  • Overlay and integrate datasets to delineate landscapes of regional significance (focal areas and connectivity)  • Provide information on landscapes of regional significance to conservation partners to implement specific conservation actions  •Develop conservation designs for multiple representative species  • Create distribution maps for regional responsibility/high concern species. | RCN Topic 4: Identification of Regional Focal Areas and Corridors for the Conservation of Species of Great Conservation Need in the Northeast | •Consider submitted RCN projects (grassland birds, black rail, permeable landscapes) | NEAFWA RCN for grassland birds and rail; possibly LCC for permeable landscapes |
| NALCC: Assessments of landscape connectivity | •*Consider supporting RCN project on permeable landscapes* | LCC, TNC |
| NALCC: Identifying focal areas for conservation (for herps) | •*Support for PARCA project NE-PARC* | LCC, NE-PARC |
|  | •Consider focus area, green infrastructure synthesis of existing projects | LCC |
| •*Complete Phase I of LCC Designing Sustainable Landscapes Project to develop landscape designs in three pilot watersheds* | LCC, UMass |
| Action 9: Test conservation design approaches | NALCC: Forecasting changes in aquatic systems and resilience of aquatic populations (NALCC 2010) NALCC: Forecast effects of sea level rise on habitat of piping plovers & identify responsive conservation strategies (NALCC 2010);  NALCC: Designing Sustainable Landscapes for Wildlife: forecasting changes to landscapes, habitats and species & development of decision support tools (NALCC 2010&2012); |  |  | •*Complete Phase I of three LCC projects in pilot areas and expand to rest of LCC* | LCC, UMass |
| Action 10: Science translation | **NALCC: working to explain and translate products through several projects, including the regional SWAP synthesis effort** |  |  | •Work with PIs on completed RCN projects on user guides and other tools to explain and translate  Create “Science Delivery” team | NEAFWA |
| Conservation Adoption and Delivery | Action 1: Provide products of biological planning and conservation design | RCN: Development of Model Guidelines for Assisting Local Planning Boards with Conservation of Species of Greatest Conservation Need and Their Key Habitats through Local Land Use Planning (RCN 2008-2); **NALCC: Information Management Needs Assessment and Website development. RCN: User Guides for terrestrial and aquatic maps; RCN: improvements to rcngrants.org website;**  **NALCC/RCN: Synthesis of regional spatial data and tools.** | • An information delivery mechanism should be a requirement of every future RCN product  •Provide cookbook or catalog of on-the-ground implementation details that translate conservation design results into practical actions or projects  •Communications, tool kit, users guide | NALCC: Best management practices (for vernal pool dependent herpetofauna) | •Consider project to support BMPs for herpetofauna | LCC or NEAFWA |
|  | •Support better distribution and translation of RCN products | NEAFWA RCN |
| Action 2: Host forums for conservation delivery partners | **NALCC/RCN: Synthesis of regional spatial data and tools.** | • Take existing RCN products and fund a communications specialist to repackage and deliver information  • Deliver the results (synthesis) of the projects (products) in a meaningful way |  | •Work with states to develop a strategy for delivering results to partners. | NEAFWA |
| Action 3: Implement demonstration projects | • Implementing Bird Action Plans for Shrubland-Dependent Species of Greatest Conservation Need in the Northeast (RCN 2007-8) • Staying Connected in the Northern Appalachian: Mitigating Fragmentation & Climate Change Impacts on Wildlife through Functional Habitat Linkages (Comp SWG) • White Nose Syndrome: Multi-state Coordination, Investigation and Rapid response to an Emerging Wildlife Health Threat (Comp SWG) • Rangewide New England Cottontail Initiative (Comp SWG)  **NALCC: contributing to three demonstration projects, at different spatial scales, to test and demonstrate conservation action informed by regional-scale science and planning (NALCC 2012)** |  | RCN Topic 5: Design and Implement Conservation Strategies for NE Species of Greatest Conservation Need (Bicknell’s Thrush, Wood Turtle) | •RCN support for SGCN implementation strategies | NEAFWA RCN |
| NALCC: Adaptation planning pilot projects | •*Articulate LCC role in supporting demonstration projects* | LCC |
| NALCC: Adaptive Management Frameworks for Representative Species | •Support Adaptive Management Framework for American Black Duck | LCC, BDJV |
| Monitoring | Action 1: Coordinate existing population surveys | RCN: Development of avian indicators and measures for monitoring threats and effectiveness of conservation actions in the Northeast (RCN 2007-4)  • The Conservation of Marsh Tidal Birds: Guiding Action at the Intersection of Our Changing Landscape (Comp SWG) | •Identify and leverage existing federal monitoring programs and develop state/tribal/ngo surveys to complement the federal surveys to provide regional status  •Establish Uniform Monitoring Practices that can be applied across large geographic areas for multi-jurisdictional resources |  | •Host coordination meeting with LCC, NWRS and NPS I&M programs | LCC |
| Action 2: Identify and support unmet priority monitoring needs | RCN: Regional Analysis of Frog Monitoring (RCN 2010-4)  RCN: Development of Non-invasive Monitoring Tools for New England Cottontail Populations: Implications for Tracking Early Successional Ecosystem Health (RCN 2009-4); **NALCC Invasive species detail and reports; NALCC conservation targets assessment including measurable indicators.** | • Ensure accurate monitoring of representative species to support biological assessment and conservation design  •Identify and increase ways to include citizen scientists in monitoring | RCN Topic 6: Design and Implement Monitoring Protocols, Measures, and Indicators for NE Species of Greatest Conservation Need (aquatic, estuarine, marine) | •Further define this RCN (no projects were identified through RFP) | NEAFWA RCN |
| NALCC: Detecting changes in species distribution (for invasives) | •*Explore role in invasive species monitoring through detail by invasive species expert* | LCC |
|  | •Identify monitoring needs for selected representative species | USFWS, LCC |
| Action 3: Coordinate closely with NPS and NWRs I&M Programs | USFWS: Flyway Integrated Waterbird Monitoring and Management | •Identify and leverage existing federal monitoring programs and develop state/tribal/ngo surveys to complement the federal surveys to provide regional status |  | •Host coordination meeting with LCC, NWRS and NPS I&M programs | LCC |
| Action 4: Develop habitat monitoring objectives and assess net change |  |  | NALCC: Analysis of recent landscape change | •Explore options for assessing contemporary land-cover change | LCC, USGS, EPA |
| Action 5: Develop metrics for measuring success of conservation actions | DD: Northeast Regional Monitoring and Performance Reporting Framework (Doris Duke)  RCN: Regional Indicators and Measures: Beyond Conservation Land (RCN 2008-5) | • Specific performance criteria and reporting must be a required part of all RCN projects--best if they are standardized  • Long-term monitoring and performance evaluation to feed into the conservation framework, Fund implementation of the NE Regional Monitoring and Performance Reporting Framework |  | •NEAFWA RCN Support for implementation of the NE Regional Monitoring and Performance Reporting Framework | NEAFWA |
| Action 6: Compile results from existing accomplishment tracking databases |  | •SWG Success Stories: Immediate need for reporting on success of SWG grant-funded work. |  | •Compile recent SWG results | NEAFWA, USFWS |
| Action 7: Use results of monitoring to adapt future planning |  |  |  | •Develop protocols for regular updating of planning |  |
| Research | Action 1: Identify and prioritize applied research needs | USFWS: FWINS database |  |  | •Modify existing or develop new online research needs tracking database | LCC, USFWS |
| Action 2: Coordinate funding for priority applied research projects | RCN: Exploring the Connection Between Arousal Patterns in Hibernating Bats and White Nose Syndrome: Immediate Funding Needs for the Northeast Region (RCN 2007-9);  RCN: Lab and Field Testing of Treatments for WNS (RCN 2010-1) |  |  | •Establish process for exchange of information on emerging research needs among federal and state agency research funding programs |  |
| Action 3: Work with the Northeast Climate Science Center (CSC) to identify annual research priorities | **NALCC: in initial year of CSC (2012) served on panel that recommended science topics and reviewed proposals** |  |  | •*Establish close working relationship with new Northeast CSC; build CSC needs assessment into annual LCC needs assessment process* | LCC, USGS |
| Information Manage-ment | Action 1: Conduct an information needs assessment | **NALCC: Information Needs Assessment by Applied Geographics is being completed (NALCC 2011)** | •Support and engage in the forthcoming regional information needs assessment | Long-term data management system | •*Develop a technical team and work with contractor to conduct a Northeast information needs assessment* | LCC, NEAFWA, USFWS |
| Action 2: Design and develop database/portal | **NALCC: website is being transformed into a knowledge management system intended to encompass spatial and tabular data at regional scales; GIS analyst has been hired and is helping compile regional data** | •Develop a way for states, LCCs and other partners to immediately access the habitat mapping and geospatial condition analysis products coming out of the RCN process  •Create regional geospatial database that can be shared and used among all partners  • An information delivery mechanism should be a requirement of every future RCN product  •Support and engage in the forthcoming regional information needs assessment  • Institutionalize long term datasets on a Regional cooperative basis  • Create data sharing agreements between all members of NE conservation community | Long-term data management system | •*Based on results of Northeast information needs assessment, design and pilot a northeast database/portal system* | LCC, NEAFWA, USFWS |
| Action 3: Compile and link to existing databases | **NALCC: regional compilation and synthesis of spatial data** | Develop a way for states, LCCs and other partners to immediately access the habitat mapping and geospatial condition analysis products | NALCC: Online tool for accessing the most recent conservation designs | •*Work with partners to compile existing maps and conservation designs* | LCC |
| Action 4: Develop and maintain new specific databases | RCN: Development of an Online Database to Enhance the Conservation of SGCN Invertebrates in the Northeastern Region (RCN 2009-3)  NOAA regional climate database including climate adaptation | •Regional habitat management database  •Support development of SWAP database to promote consistency in next generation of SWAPs | NALCC: Managed Lands Database Development  NALCC: Consistent, updated secured lands database | •Work with ACJV on proposal for managed lands database; | LCC, ACJV |
| •*Support development of SWAP database pilot* | NEAFWA, LCC |
| Action 5: Develop capacity to provide database support |  |  |  | •Include technical support needs in Needs Assessment process | LCC |