Information Management System

Needs Assessment

For

North Atlantic Landscape
Conservation Cooperative

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CONTENTS

EXECUTIVE SUMMARY

To be finalized upon completion of the Needs Assessment.

1 CURRENT SITUATION

1.1 STRENGTH, WEAKNESSES, OPPORTUNITIES & THREATS ANALYSIS

1.1.1 Strengths

- Individually, the NALCC partners have a high level of IT and GIS proficiency that can be leveraged and shared for mutual benefit
    - Exposure to GIS is not new and use is prevalent
- Many NALCC partners maintain varied and valuable datasets that could be useful to other partners
    - Many are also improving existing data sets and/or deriving new, widely-relevant data
- Informal data sharing is currently common among partners, however procedures for obtaining data are inconsistent
- There are many existing **partner data sets**, products and systems that are of interest to other partners. These include: TRACS, NatureServe Explorer, Avian Knowledge Network, etc.
- There is an existing culture of cooperation among Northeast states for support of habitat-focused projects
    - Use of common data standards/classifications with ability to create higher resolution if needed
    - Regional conservation processes in place for pooling conservation funds

1.1.2 Weaknesses

- Lack of access to current and relevant raw data to support hands-on analysis
- Lack of guidance/standards/tools for partners that support making data products available to others
- Lack of clarity on current data steward or manager; leads to confusion on authoritative data sources
- Lack of awareness about current of data; leads to redundant efforts to create/collect/derive data sets rather than tapping existing resource
- Lack of metadata and descriptive information on assumptions and uncertainties
- Lack of a clear leader that could house a regional resource. Some partners, such as the USFWS Northeast Region are still adjusting to losing their dedicated, internal GIS group.

1.1.3 Opportunities

- New staff at NALCC focused on compiling/cleaning up existing data, creating metadata and developing mechanisms to make data available
  - One person at USFWS Northeast; one person via The Nature Conservancy Northeast
- NALCC in unique position to:
  - Provide visual understanding of regional activity
  - Support communication and collaboration among partners
  - Offer interpretation and "meaning" of data to support decision making rather than just view of raw data
- Opportunity to build on existing, related efforts:
  - Piggy-back onto/synchronize with new NALCC web-site effort
  - Funded efforts to develop standards and a common lexicon for State Wildlife Action Plans (SWAP)
  - Efforts in other LCC's (e.g., ScienceBase, LCMap, DataBasin)

1.1.4 Threats

- Concerns and misunderstandings about Information Management System Needs Assessment Management project direction need to be addressed
  - Avoid perception of overstepping boundaries and interfering with partners already performing important analyses
- If data format and varied scale requirements are not met, many partners will not contribute to or use resource
  - For example, potential for loss of data integrity when "rolling up" data of differing accuracies and scales (i.e., challenges in aggregating local data into regional data sets)
- Inability to design a system that can be effectively implemented
  - Challenges coming to consensus on chosen approach
  - Confusion caused by competing approaches and systems

2 IDENTIFIED NEEDS

2.1   USE CASES

The following presents several use cases that represent the type of activities that NALCC partners are pursuing and some of the data and technology opportunities that exist as well as challenges that remain impediments.

1. *Providing the regional context:* **Statewide Wildlife Action Plans (SWAP) are aggregated to create "Regional Wildlife Action Plan"**

- Currently, State Wildlife Action Plans are similar, but different enough that assembling a regional resource is very difficult
- Creating a regional wildlife action plan as the composite of a state plans would be valuable in many ways
    - States could see their own plans within the regional context
    - Cross state activities could be better planned/coordinated
- States need to be able to create their plans to address the unique challenges and organizational frameworks of each state. However, there are many common elements that could be pursued in standard ways across the states, such as:
    - Identifying "species with conservations needs"
    - Identifying the habitats used by those species
    - Articulating the management activities aimed at those species (e.g., invasive species removal, controlled burns, new acquisitions, et al)
- With appropriate standardization (e.g., data standards, common lexicon, etc.) common elements could be pulled from individual SWAPs to produce the regional WAP within a new information management system for the NALCC
    - Building on initial work from the Regional Wildlife Action Plan DB via the Regional Technical Committee
    - Funding for SWAP work could be linked to delivering some products in the standard format and using the common lexicon
    - This approach could be easily tested with a subset of willing states

2. *Assessing the effectiveness of management activities:* **Planning for management activities at the "land parcel" or "refuge" level**
    - Currently, many management decisions made at the land parcel or refuge level may be made only within the context of that parcel or facility
    - A strong, regional information management system should be able to **provide the regional context that helps guide management priorities**, especially for larger organizations with many facilities that may be competing for limited resources.
    - Key questions about the regional context may include, but are not limited to:
        - **Is this particular place important** as part of the regional landscape? If not, should we be pursuing the management activity at all?
        - If it is important, **what are its vulnerabilities and stressors** (e.g., increasing water temperatures)? Are our management activities addressing the vulnerabilities?
        - If we are pursuing these management activities, are they working? **Are we monitoring to validate our success, or acknowledge failure**? If we are failing, is it time to move on to activities that may be more successful?

3. *Aligning priorities across organizations:* **Private non-profit conservation planning to align with established governmental priorities**

- Some members of the NALCC are non-governmental organizations such as private non-profits. Some of these organizations are national in nature and pursue their own conservation planning for their own facilities and it is can be difficult to assemble and understand the multiple layers of governmental priorities.

- A regional information resource management system offers the opportunity to build a database and map that articulates governmental priorities (e.g., species of interest; habitats of interest; ongoing priority management activities; etc.)

- A widely available "conservation priorities database" would be a valuable tool in helping to align management activities and new conservation investments with established priorities

2.2 HIGH LEVEL BUSINESS & PLANNING NEEDS

As the use cases above illustrate, there are several high level "business and planning needs" that an information resource management system should be able to address:

- Create a relevant, reliable information management system for **viewing local situations within regional context** to better support decisions and understand where to focus efforts and financial resources. Key "views" for a regional system will include:
  - Reliable base line information across the region (e.g., base maps, aerial imagery, state level environmental resources, etc.)
  - Portrayal of **key decisions** made by, and **key priorities** established by partner organizations
  - Inventory of ongoing project and scientific activities within the NALCC

- **Create consistent, relevant and usable data products from NALCC sponsored activities** and make widely available for partner consumption. When NALCC invests in projects, useful data should be one of the deliverables.

- Support for **streamlined** development and execution of **data sharing agreements** between partners
  - Guidance on format and content

- **Improved collaboration and coordination** with directly neighboring LCCs through data sharing, potential technology/system sharing and communication of priorities. Neighboring cooperatives include:
  - Upper Midwest/Great Lakes
  - South Atlantic
  - Appalachian

The following describes the finer grained functional needs for an information resource management system that will help satisfy the higher level business needs and use cases described above.

- Publication of NALCC map and web services to 3rd parties (e.g., for priorities)

- Consumption of map and web services from 3rd parties (e.g., orthoimagery from states)

- Searchable Index of available resources including third party data sets. NALCC members need access to understand what's available for the region.
    - o Metadata
    - o Quality/utility assessment
    - o Studies and models
    - o Maps and web services
    - o Ability to search for collaborators/working groups based on species of interest
    - o Guidance on standards and tools
        - ▪ Recommendations on how to capture "uncertainty" and "assumptions" as data is collected so limitations are explicit

- Value added products such as:
    - o Model results
    - o Access to "raw" data that is processed to be made more useful
        - ▪ NWI data clipped to state boundaries and buffered out into the ocean.
        - ▪ More regularly updated land cover with land cover change identified

- Assembled regionwide data:
    - o National Wetlands Inventory (NWI)
    - o Climate change grid
    - o Land cover change
    - o Northeast terrestrial habitats
    - o Parcels
    - o Protected Areas (from states and/or PAD-US)

- Portal providing a description and a gateway to access partner systems such as:
    - o **Tracking and Reporting Actions for the Conservation of Species (TRACS[1])**. Wildlife TRACS is the tracking and reporting system for conservation and related actions funded by the US Fish and Wildlife Service (USFWS), Wildlife and Sport Fish Restoration (WSFR) Program. It is intended to replace the existing Federal Aid Management System (FAMES) and is scheduled for release in January 2013. The TRACS system aims to give

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[1] Wildlife TRACS website http://www.publictracs.us/

USFWS spatial and descriptive data to assess the effectiveness of grants and other funding that is invested in conservation efforts.

- o **NatureServe Explorer**. An authoritative source for information on more than 70,000 plants, animals, and ecosystems of the United States and Canada. Explorer includes particularly in-depth coverage for rare and endangered species.

- o **The Avian Knowledge Network (AKN)**. The goal of the AKN is to understand the patterns and dynamics of bird populations across the Western Hemisphere.

- o **The Nature Conservancy Northeast Region Portfolios**. These products are a compilation of many studies and reports and produce key data sets including:
  - Regional protected lands
  - Ecological systems and habitats
  - Regionally compiled base information on landforms: hydrography, bedrock geology, elevation

- o **University of Massachusetts Amherst Designing Sustainable Landscapes Project**. The goal of this project is to assess the capability of current and future landscapes within the extent of the NALCC to provide integral ecosystems and suitable habitat for a suite of representative species, and provide guidance for strategic habitat conservation. This project has implemented several models that generated data that may be of broader interest.

- o **Regional Conservation Needs (RCN) Synthesis**. A synthesis of regional conservation information including ongoing and completed work from the RCN program and LCCs. This synthesis provides a framework for regional habitat classifications that can be aggregated.

- Applications and tools that provide access to the services, value added products, data and systems described above through a unified user interface
  - o Characteristics of tools:
    - Accessible on mobile devices (e.g., "what habitat am I currently within?" tool)
    - Customizable decision support tools (e.g. ability to build ad-hoc queries of data)
  - o Example of tools:
    - Input to and maintenance of databases in the field
    - Shared workspaces to support collaboration and communication (e.g. SharePoint)
    - FTP for large file transfer
    - Interactive web map with access to a wide variety of regional data covering the full NALCC

2.4 BENEFITS & JUSTIFICATION

- **Improved data access**, tools and support for all "levels" of users:
  - **Program Managers and staff**: Ready access to simplified maps and viewers that allow data exploration and support decision making
  - **GIS Users**: User friendly access to assembled data, tools and resources that support project analysis and contextualization
  - **GIS Professionals**: Access to raw and assembled data/web services and resources/technical support for project analyses
- **Reduced time spent** searching for relevant, available data and resources by improving access to data and systems:
  - Searchable index of data and resources (including potential collaborators)
  - Consumption of 3rd party map and web services
  - Links to relevant partner systems that complement NALCC data/tools/services
- **Improved decision making** support through:
  - Better access to data, tools, value added products
  - Clearly communicated priorities
  - Regional view and contextualization of local projects, priorities, decisions
- **Reduction in redundant efforts** for data development/collection, data analysis, tool development
  - More effective and efficient use of conservation funding
- **Better ability to generate regional strategies** through the coordinated activity of states/regions. For example:
  - Support for development of a regional adaptation strategy through the building of a regional habitat management database
  - Via coordinated State Wildlife Action Plans (SWAPs) that can provide a regional view across the NALCC

3 VISION

The vision and associated strategic and programmatic goals were derived from the identified needs cataloged above in Section 2. The vision and goals do not aim to immediately meet all identified needs. Rather, they represent the near term priorities that can reasonably be accomplished first and that will lay the foundation for a broader information management system. Achieving these goals should address a large proportion of the most important identified needs.

3.1 GENERAL VISION

Establish an information management system that has the following characteristics:

- Provides a regionwide view across the LCC

- o Provides the regional context for more local activities
- o Provides an inventory of LCC activities and priorities
- Is available to all partners
  - o To help inform planning and decision making
- Facilitates planning to help deliver "conservation on the ground"
  - o To preserve landscapes that support biodiversity

3.2   STRATEGIC GOALS

The following three overarching strategic goals identify high level objects that should be pursued following the adoption of this plan:
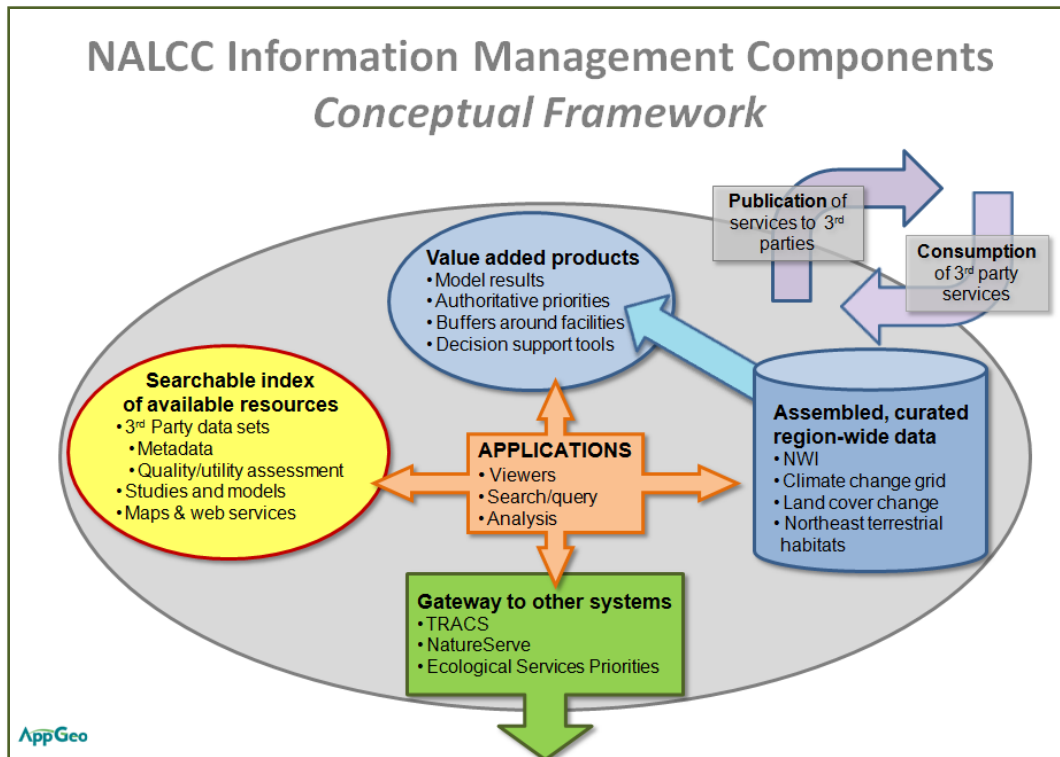
1. Design and create a regional information resource management capacity that is available to all partners

2. Populate the information management system with relevant, regionwide data and then actively steward those data to keep them current. Minimum initial data sets include:
   - o Existing base map information
   - o Northeast terrestrial habitat information
   - o Relevant extracts from existing SWAPs
   - o Information on all funded NALCC activities

3. Provide tools for accessing and portraying the data within information management system to enable partners, at a minimum to see:
   - o The regional context of local activities
   - o The location and extent of funded NALCC activities

3.3   PROGRAMMATIC GOALS (RECOMMENDATIONS/OPTIONS)

The following provides specific recommendations for pursuing finer grained activities that will lead to each of the three strategic goals being met.

Strategic Goal #1: Design and create a regional information management capacity that is available to all partners

1. Formally initiate the design of the information management system at the next level of detail. The graphic below represents an initial *concept* for the components that would constitute the information management system.

NALCC Information Management Components
Conceptual Framework

2. Identify and engage with partners who are willing/capable of potentially housing the information management system

3. Identify a budget and sustainable funding model for building and maintaining the information management system

Strategic Goal #2: Populate the information management system with relevant, regionwide data and then actively steward those data to keep them current.

1. Perform a detailed inventory of data sets that are already available on a regionwide basis and may be housed within/accessed by the information management system (e.g., base map information; protected lands; landcover; etc.).

2. Identify work necessary to assemble regional data sets from existing state-based data sets (e.g., state-based land use; etc.).

3. Begin assembling regionwide data sets from existing data resources.

4. Commence planning for regionwide data sets that do not yet exist, including:
   a. Inventory of NALCC sponsored activities
   b. Inventory of authoritative conservation priorities
   c. Relevant extracts from SWAPs (e.g., priority habitats, etc.)

5. Establish standards and procedures to identify data products that should be considered as deliverables from NALCC sponsored contracts. A flow of these deliverables over time will help keep the information management system database current and growing.

Strategic Goal #3: Provide tools for accessing and portraying the data within information management system to enable partners

1. Identify and plan the initial, priority set of tools for providing access to information management system data. These include, but are not limited to:
    a. Web-based viewers for querying and visualizing the data
    b. Consumable web services that provide portrayals of the data to third parties
    c. Data download capabilities

2. Design and construct prototypes/initial versions of focused web-based tools that access the data in the context of specific business requirements.
    a. Tool that portrays regional context for a user identified location
    b. Tool that provides access to the location and extent as well as reporting of funded NALCC activities to show where active conservation work is taking place

4 IMPLEMENTATION GUIDANCE

4.1 PRINCIPLES & APPROACH

- Use agile development and rapid deployment methods
    o The long timeframe and expense of TRACS serves as a counter-use case (i.e., what to avoid)
- Remain flexible, nimble and ready to adapt to changing technology and priorities
- Leverage existing projects to maximum extent possible
    o New NALCC web-site
    o ScienceBase?
    o DataBasin?
    o Regional Wildlife Action Plan DB

4.2 GENERAL BUDGET

TBD following approval of the general program

4.3 GENERAL TIMELINE

TBD following approval of the general program

APPENDICES

4.3.1 Appendix 1: Project Methodology

4.3.2 Appendix 2: Survey Results