NORTHEAST REGIONAL CONSERVATION NEED GRANT QUARTERLY REPORT

Grant Number: 2007-03
Grant Title: Identifying relationships between invasive species and Species of Greatest Conservation
Need in the Northeast region.

Grant Receipt:
Grant Contact Name: Glen N. Stevens and Scott D. Klopfer
Report#- 9 (2010 3rd Quarter)

Were planned goals/objectives achieved last quarter?   Yes.

Regional Conservation Need Addressed: 2007 Priority RCN Topic 2, "Identify Invasive Species that
Impact Species of Greatest Conservation Need in the Northeast."

Progress Achieved:

The tasks slated for activity in this quarter were:

1. Complete all SGCN and invasive species habitat assignments.
2. Complete the initial pairwise comparison of individual GCN species and invasive species, as
   detailed in the proposal. This will populate the database (objective 5), that will be used to
   develop individual comparison reports that are the deliverables for this project (Objectives 1,
   3 and 4).

We completed general habitat relationship assignments for each of the invasive species and SGCNs
(birds, mammals, herptiles, and fish) in the database. The general habitat relationship assignments
were made by completing background searches (typically Internet based). Information on general
habitat usage was gleaned from this information and added to the database using general habitat
classes for types where individual species could be expected to occur. The general habitat classes
used were:

Freshwater	Lake	"Early successional"	Shrubland
	River		Grassland
	Wetland		Border/edge
Marine	Open		Woodland
	Intertidal		Pasture
	marsh		Ag
	Beach	Other	Rock/Cliff
Forest	Deciduous		
	Coniferous (hemlock)		
	Coniferous – other		
	Mixed		
	Deciduous/Coniferous		
	Young Forest		

For each SGCN, we assigned a value of 1 or 2 if the species was expected to occur within that
general habitat type in the Northeast region. Values of "1" were used to indicate a likely occurrence
in the type, and a "2" was used when the type constituted a specialized affinity by the SGCN for the

type. The same process was used to assign general habitat affinity for all the invasive species identified. Lists of invasive species were compiled from state lists (where available) as well as other sources (USGS, NatureServe). Earlier in the project, we shortened the list of invasive species to include only those species identified in 4 or more states to be included in the regional analysis. However, this resulted in the conspicuous absence of several species with potential for regional impacts in the future (e.g., northern snakehead). We have since decided to re-incorporate those species into the analysis, and the attribution of those species is ongoing.

In addition to the habitat affinity information, we have included simple codes aimed at categorizing each invasive species in terms of its likely impact to SGCNs. The attributes used include:

Threat	I-rank	For plants only; taken from NatureServe classification directly (High, Medium, Low, or Insignificant)
	individual species	Qualitative assessment for SGCNs only (High, Medium, Low) based on relative threat posed directly to species or habitat
Invasive Characteristics	Displace native	Assigned as 1 or 0; if invasive displaces SGCNs through competition, predation, or other direct impact
	Reduce Habitat Quality	Assigned as 1 or 0; if species reduces habitat quality for SGCNs through degradation or competition for resource space
	Drain on resources	Assigned as 1 or 0; if invasive species reduces available resources otherwise available to SGCNs
	Alter ecosystem processes	Assigned 1 or 0; if invasive species alters ecosystem processes that would result in negative impact to SGCNs or habitats

The threat and Invasive characteristics attributes will be used, along with habitat affinity information, to allow users to insert importance values for each in compiling lists related to importance (regional, state, other).

The analysis phase of the project has been developed but will not be executed until the final invasive species list/database is complete. Once all invasive species have been identified, we will run all pairwise comparisons between SGCNs and invasive species using habitat affinity information. To date, we have included over 240 species classified as invasive in the Northeast.

Clearly invasive species have the greatest impact on SGCNs that share common habitat space. For each SGCN/invasive species pairing, we will multiply the habitat for each (0, 1, or 2) to identify overlaps, then sum the totals across all habitats to determine the final value. When SGCNs and invasives share more than one general habitat, the threat is increased and the value will be higher. Where invasives and SGCNs share habitats identified as "specialized" the value will be doubled (i.e., 1 x 2 = 2 as opposed to 1 x 1 = 1). This value will be incorporated into the final invasive species impact database and used as part of the importance ranking.

The invasive species impact database will contain several attributes that will be used to complete the importance rankings by region and state. Each attribute will be assigned an importance value that will provide weighting criteria for the final impact scores. The attributes used will include:

Presence in each of the NE states	Assigned as 1 or 0; single value field for each of the states in the NE
Total number of NE states	Sum of all states species occurs in
Displace native	Assigned as 1 or 0; if invasive displaces SGCNs through competition, predation, or other direct impact
Reduce Habitat Quality	Assigned as 1 or 0; if species reduces habitat quality for SGCNs through degradation or competition for resource space
Drain on resources	Assigned as 1 or 0; if invasive species reduces available resources otherwise available to SGCNs
Alter ecosystem processes	Assigned 1 or 0; if invasive species alters ecosystem processes that would result in negative impact to SGCNs or habitats
Total number of SGCNs impacted	Count of SGCNs impacted via habitat affinity
Total score of SGCN impact	Sum of all SGCN impact scores

Weights for each of these fields will be used as a multiplier to control the relative impact each has in the final score calculated for the species. These importance values will likely change depending on the lists we are attempting to create (e.g., regional level vs. state). This database will allow other users of this information to synthesize their own lists according to user-defined importance values as well.

Difficulties Encountered:
We have elected to "backtrack" on the overall number of invasive species included in our analysis to include as many species of management interest as possible. This required additional time for identifying invasive species and attributing the related data.

We have also encountered more incomplete species range data for states that we anticipated. Whenever possible, we have used information gathered at the regional level (e.g., aquatic invasive species lists by-watershed from USGS Non-indigenous Aquatic Species list, NatureServe for plants, etc.) however we must assume that many of the invasive species derived directly from states are incomplete.

In addition, there are many native species that are considered invasive in other portions of the region – particularly for freshwater aquatic fish. This poses a problem when including this information on the regional level. We are presently formulating a protocol to deal with this issue. Further, many invasive species (e.g., European starling) are considered to be "naturalized" and do not appear on many invasive species lists although likely to impact SGCNs. This poses a challenge for consistency in the final assessment.

Activities Anticipated Next Quarter:
3. We will complete all SGCN and invasive species habitat assignments.
4. We will complete the initial pairwise comparison of individual GCN species and invasive species, as detailed in the proposal. This will populate the database (objective 5), that will be

used to develop individual comparison reports that are the deliverables for this project (Objectives 1, 3 and 4).

5. We will begin final reporting activities. These include development of an interactive spreadsheet to allow users to generate their own analyses, a final report based on our regional and state analyses, and a website to facilitate delivery of project information and products.

Costs:

Are you within the approved budget plan? Yes

Are you within approved budget categories? Yes, expenses and matching funds have been used to support labor for the project.

Signature

Date   October 5, 2010

Scott D. Klopfer for Dr. Glen Stevens