NORTH ATLANTIC LANDSCAPE CONSERVATION COOPERATIVE GRANT 2014 PROGRESS REPORT

Quarter: (circle one) 2014 1st  2014 3rd 2014 4th

Grant Program, Number and Title: NALCC 2012-06: F11AC00223 MOD #3 NALCC 1420
Spatially explicit models for aquatic habitats

Organization: Downstream Strategies, LLC

Project Leader: John (Fritz) Boettner

Abstract: Please provide a short (1-2 paragraphs) abstract that addresses EACH of the following: the objectives of your project, accomplishments to date, future plans and timelines with an estimate for when the project will be completed.

Were planned goals/objectives achieved last quarter?

Year two (2014) second quarter milestones include performing assessments for a list of species and having six models at the draft stage of development. The project continues to be delayed due to several factors, at this stage in the project the delays are based on stakeholder feedback, data procurement, a difficulty developing a coastal modeling framework. While model development has been slowed, there has been significant progress on the development of a Chesapeake Bay Brook Trout Model. A draft model has been completed and is being shared and reviewed with various stakeholders.

The coastal model —Winter Flounder—is being developed for the Narragansett Bay of Rhode Island. Data development has finished and the model has been run several times to evaluate the effectiveness of the modeling framework. Results of this model have been shared with a technical stakeholder group and feedback is being integrated into the modeling process. A web mapping application was developed, link here: http://bit.ly/POZR16 , that displays all the response data used for the model. DS was been slowed due to not receiving the data or feedback necessary to develop preliminary models. A methodology document has been developed, which is a working document that outlines the modeling process.

Moving forward into the 2014 quarter 2, DS has put together a project status document that was shared with the NALCC assessment coordinator group. This document was shared with the group and a subsequent meeting will be convened to talk about the remaining goals of the project. DS was originally contracted by the NALCC to perform between 15-20 habitat assessments—known as models— for areas within the NALCC region. Unfortunately, the project team has spent an unexpected amount of time performing unforeseen tasks and at this point DS cannot develop 15-20 models and needs to reevaluate the goals of this project. The goal of our team is to create data, tools, and information that will be useful to you and your stakeholders and we will work hard to that end. Below are a few tables that show a breakdown of where our time was spent (I have detailed records of each hour spent and have given that to Scott Schwenk). The tables below show that we have spent an unexpected amount of time with data development and coordination, which really stressed the total budget. We can shift money around (somewhat) in the budget to accommodate more Downstream Strategies labor time.

Table below shows the total project allocation and budget spent.

Budget item	% of total budget allocated to each budget item	% of allocated budget spent	DS comments
Downstream Strategies Labor	60%	81%	Budgeted to complete 15 models, as you can see a very small port amount and we have 1 to no models at this point. Obviously, this at this point. I am open to any suggestions. Also, there is flexibilit see, we are only a little more than halfway through the total budge original scope to reallocate funds.
WVU (Petty Strager)	8%	49%	This cost is really not flexible, but depending on Todd's and Mikes could pull a small amount out of for DS labor
Web tool development	18%	0%	This budget is set aside for Web-tool population and development with the NALCC models. I think this budget could be cut in half (c total number of models that need to be input into the tool.
Expenses	9%	8%	This cost is also flexible, I envisioned DS traveling a lot more and more models, but that has not happened, so this is really not alloca could pull from here.
Overhead	5%	23%	Not a large amount and fixed
Totals	-	**54%**	A little over halfway in the total budget

Table below shows a breakdown of time spent by DS staff on certain task types. Percentage based on time spent, not project total.

Staff	Work Category Hours – Percent of time				
	Coordination	**Data**	**Model**	**Research**	**Total**
Ben Gilmer	27%	35%	5%	33%	16%
Fritz Boettner	82%	9%		9%	25%
Jason Clingerman	34%	50%	7%	10%	52%
Kendra Hatcher	4%	96%			2%
Meghan Betcher		100%			2%
Grand Total	**45%**	**37%**	**4%**	**13%**	

Table shows the percent of time spent for each model.

Staff	Work Category Hours		
	Brook Trout	Other	Winter Flounder
Ben Gilmer	1%	85%	14%
Fritz Boettner	1%	85%	14%
Jason Clingerman	27%	41%	32%
Kendra Hatcher	0%	24%	76%
Meghan Betcher	0%	0%	100%
Grand Total	**14%**	**60%**	**26%**

Progress Achieved: (For each Goal/Objective, list Planned and Actual Accomplishments)

Due to the dynamic nature of the project and slow progress, several goals have not been accomplished since the project beginning. Listed below are the updated goals and accomplishment for the 4th quarter. However, in light of this setback, the project made progress on framework components that will make the project more efficient.

1. Phase-one goals:
    a. Review and identify gaps
        i. Planned: DS will work with the NALCC stakeholders to identify a list of the predictor and response variables useful for documenting current conditions and assessing threats to the aquatic habitats of interest.
        ii. Actual:
            1. **1st Quarter:** Have begun the process and developed a plan for identifying data needs across the NALCC region. This process has begun by reaching out to stakeholders and experts in the field to determine data availability and procurement strategies.
            2. **2nd Quarter:** Presented the project overview at several meetings to a multitude of stakeholders across the region. Case study response and predictor variables were selected for the coastal portion of the project. The project team has begun to put together a methodology and approach that will be presented the coastal stakeholders
            3. **3rd Quarter:** Group decided on winter flounder as the case study species for the coastal assessment and has begun collecting and processing data for model development. Worked with Scott Schwenk to identify predictor datasets to be collected and processed for the NALCC region. Also, our project team connected with Ben Letcher's group at the USGS and has begun collaborative discussions about developing a Brook Trout model and sharing data.
            4. **4th Quarter:** Data acquisition has begun, data requests for both predictor and response datasets have been distributed. The project team is waiting on response datasets to arrive, with a hope of modeling in the 1st quarter of 2014. Predictor datasets have been identified and are being acquired, processed, and tracked.
            5. **1st Quarter (year two):** A list of models and response and predictor variables have been identified and progress is being made to finish existing models and start on a new set of assessments.
            6. **1st Quarter (year two):** Continued progress is being made to finish existing models and start on a new set of assessments.
    b. Assess needs
        i. Planned: DS will work with the NALCC to determine the best approach to address the gaps identified in prior goal.
        ii. Actual:
            1. **1st Quarter**: A plan was developed in coordination the NALCC project director, which outlines the step necessary to lead towards the first facilitated stakeholder meeting. These steps include a data needs assessment, formation of stakeholders and technical advisors, defining the preliminary modeling framework, defining draft biological priorities, developing and implement a survey, and setting the agenda and format for the stakeholder meeting.
            2. **2nd Quarter**: Several documents and tools where created and published to the project management website, these include:
                a. **Stakeholder contact database:** Over 100 categorized contacts housed online @ smartsheet.

b. **Web-mapping application (ArcGIS online):** http://www.northatlanticlcc.org/projects/downstream-strategies-project/web-mapping-test

c. **Midwest and Great Plains Assessment Models Data Summary**: The top five anthropogenic and top five natural variables from each model for each FHP and a regional model are summarized in this brief. This summary pinpoints only those variables that were most important in structuring the responses for each model. Across all models, each variable is tabulated for the number of times it is occurs as one of the most influential (top 5 of each category). This analysis presents the relative usefulness of the most important variables in structuring regional- and fhp-scale model responses.

d. **Preliminary Framework Concept: Inland fish habitat modeling for the North Atlantic Landscape Conservation Cooperative**: Downstream Strategies is committed to a stakeholder-driven process to guide each phase of this project; we propose the following methodology as a potential template for much of the work for inland stream modeling. It is not our intention to dictate the process, but inform the NALCC stakeholders about a generalized methodology that has shown to be useful in the past, and that could be implemented for this project, should the stakeholders find that it would meet their objectives and expectations.

e. **Incorporating future climate and land use changes into aquatic habitat assessments:** Case study that demonstrates how readily available downscaled climate change and land use development models can be incorporated into species distribution models to characterize potential future changes in aquatic conditions to better inform long-term conservation and restoration planning at the catchment level.

f. **Case Study: Analysis of scale on boosted regression tree fish habitat models:** Recent modeling efforts at the regional and FHP scale have indicated that smaller-scale models are likely necessary to pinpoint localized stressors. From discussions with experienced modelers and fishery professionals, HUC8 watersheds were agreed upon as the most appropriate scale. This report summarizes a case study that demonstrates the effect of scale on the assignment of stressors from predictive BRT models. Specifically, we modeled the same response at three different scales and for two separate HUC8 watersheds.

g. **Project Brochure:** A two page brochure providing an overview of the NALCC aquatic habitat assessment project.

h. **Proposed Methodology for Aquatic Assessments:** This document details a preliminary methodology that we will use to guide the modeling process. This document is a working document and will be updated as input is gathered and decisions on the methodology are made.

i. **Draft Review of Priority Aquatic Species:** To inform the aquatic assessment project, Downstream Strategies (DS) completed an initial review of priority species across all states within the North Atlantic Landscape Conservation Cooperative (NALCC). This list is intended to show existing priority species across the region in order to inform stakeholders and the project team as we collectively decide on a subset of species to include in the assessment project. The review provided here is in no way comprehensive and should therefore be viewed as an initial WORKING list of species occurring most frequently on state and federal

management plans throughout the NALCC. Additional priority species or other biological endpoints identified by stakeholders can be integrated into the matrix and used in the decision making progress.

j. **Spreadsheet of Preliminary Priority Aquatic Species:** To inform the aquatic assessment project, Downstream Strategies (DS) completed an initial review of priority species across all states within the North Atlantic Landscape Conservation Cooperative (NALCC). This list is intended to show existing priority species across the region in order to inform stakeholders and the project team as we collectively decide on a subset of species to include in the assessment project. The review provided here is in no way comprehensive and should therefore be viewed as an initial WORKING list of species occurring most frequently on state and federal management plans throughout the NALCC.

k. **Online project overview presentation:** Habitat Assessment Models and Decision Support Tools for Aquatic Habitats Fritz Boettner of Downstream Strategies presents on the North Atlantic LCC funded project to develop a decision support tool for an aquatic assessment of the Northeast. The presentation focuses on the development of a modeling methodology, process and outputs that came out of the modeling, and how stakeholders are needed for the project to be a success and develop quality assessment outputs. (http://applcc.org/resources/video-gallery-and-webinars/webinars/neighboring-lccs/habitat-assessment-models-and-decision-support-tools-for-aquatic-habitats)

3. **3rd Quarter**: Performed research and examined existing datasets to develop a proposed framework and methodology for the Coastal Model.
4. **4th Quarter:** DS continues to hold meetings and discussions to facilitate the decision making process. Additionally, DS has given additional presentations and webinars to various stakeholders to encourage participation and decision making.
5. **1st Quarter (year two):** Technical committees have been coordinated for both Winter Flounder and Brook trout. Models are in development.
6. **2nd Quarter (year two):** Technical committees have been coordinated for both Winter Flounder and Brook trout. Brook Trout model is at draft statge and winter flounder model has gone through several iterations..

c. Report on findings
   i. Planned: Drafting of an assessment report and creating a PowerPoint presentation for key stakeholders and the NALCC.
   ii. Actual:
      1. **2nd Quarter:** Pieces of the report have been completed (listed above) and were submitted for review in Q2. All of these briefs are hosted on the project website.
      2. **3rd Quarter**: As mentioned above, method and framework document has been created

2. Phase-two goals:
   a. Coordinate Stakeholders: Several milestones have been reached regarding stakeholders:
      i. **2nd Quarter**: Stakeholder groups formed
         1. A project coordinators group has been developed, including representation from NALCC, USFWS, ACFHP, WVU, and DS. This group has been holding bi-monthly conference calls since May.
         2. The beginnings of a coastal/estuarine stakeholder group have developed, including the selection of case study species and key participants.
         3. Emily Greene and Julie Devers are leading the coastal and estuarine modeling

portion, while Callie McMunigal is leading the inland modeling effort.
4. Each of the leads has been pulling together key stakeholders and DS has been presenting (4-5 times) the project overview via webinars.

ii. **3rd Quarter**: Technical stakeholder group has been established for the coastal assessment
iii. **4th Quarter**: Semi-formal group has been identified for the Brook Trout models, still determining how the modeling effort will move forward. Additionally, several new team members have been added to the coordination team that are helping with the prioritization of species.
iv. **1st Quarter (year two):** Winter founder and Brook tour models have technical review stakeholder committees.
v. **2nd Quarter (year two):** Winter founder and Brook tour models have technical review stakeholder committees.

b. Develop model framework:
i. **2nd Quarter**: A preliminary framework document has been written and will be modified during the case-study modeling process for both inland and coastal assessments.
ii. **3rd Quarter**: Winter flounder was selected as the case study species for the Coastal assessments. A framework and methodology document has been provided to the project team and is being used as a working document for the team. A literature review was performed to drive the initial framework of the method document. Datasets, both predictor and response, are being collected and processed for use in the Winter Flounder model and other yet-to-be determined species.
iii. **4th Quarter**: 1km hexagon grid for the coastal assessments has been created and finalized as the modeling unit for the coastal assessment. Also, the 3-mile nautical boundary was selected as the coastal model boundary
iv. **1st Quarter (year two):** Chesapeake Bay was selected for a brook trout model
v. **2nd Quarter (year two):** Chesapeake Bay was selected for a brook trout model and model was developed using existing framework and process. Stakeholders are continuing to discuss alternatives and next steps. Winter Flounder model framework has bed drafted, with structured response and predictor variables. Several model runs have been performed and fine tuning of the framework is underway.

c. Buy-in from stakeholders:
i. **All quarters:** This is still in progress, but DS has given 6-9 presentations to a multitude of stakeholders

d. Finalize process:
i. Not accomplished

3. Phase 3, perform assessments:
a. Assessment have begun with Brook and Winter Flounder, DS is still having data issues and delays due to slow feedback from technical committees. A Project status update document was provided that outlines issues and recommendations.

Difficulties Encountered:

1st Quarter (year two): Difficulties encountered during this project continue to be the time needed to organize stakeholders, encourage participation, and make decisions. It was anticipated that it would be a quick exercise to get people involved and make decisions; this has proven to be difficult. Data collection is another activity that is taking more time than anticipated. The project team assumed the data could be gathered in a timely manner and provided to the modelers. Efforts are being made by the coordination team to collect data and we hope to be modeling by the beginning of Q1 of 2014. A technical committee has been formed for Winter Flounder and Brook Trout. Additionally, a list of prioritized species has been put forward by stakeholders, which will help determine future models as part of this project. The delay in the project timeline has created budget issues, which

will likely decrease the quantity of models the project team will be able to create.

2nd Quarter (year two): The difficulties listed above in the 1st quarter reaming to be a road-block to completing models. There was an overestimate of stakeholder capacity for these assessments as proposed. At this point the coordination team are reviewing the present budget and determine a path forward to successful competition to this project. Below are our recommendations.

Recommendations moving forward

- Continue with the Winter Flounder model, focusing more on creating a spatial and modeling framework that can be applied for any coastal species. Spend the time and effort on creating a replicable modeling framework and an example model that can be used for other coastal species.
- Continue with the Brook Trout Model, slowing the process down to accommodate the requests from stakeholders and integrating new scenarios, variables, tools, and data that are based on user input. Focus on creating results and tools that will be extremely useful to the stakeholders and allow time for a peer review process.
- Develop a diadromous species modeling framework and case study model, possibly River Herring. Similar to the coastal assessment, spend time creating a replicable framework and a case study model.

Final deliverables

- Brook Trout model
    - Spend more time with stakeholders and process
        - Integrate new variables
        - Develop climate change scenarios
        - Explore invasive species integration
        - Peer review process
    - Possibly hold a workshop with all stakeholders (including other modeling efforts) to refine the process and outputs
    - Input final brook trout model into final Decision Support Tool
- Winter Flounder model
    - Replicable coastal assessment methodology
        - Continue to work with technical team to create a useful model and apraoch
    - Winter flounder model
    - Input into the decision support tool
- Diadromous (River Herring) model
    - Replicable diadromous assessment methodology
        - Continue to work with technical team to create a useful model and apraoch
    - River Herring (or other species) model
    - Input into the decision support tool

Activities Anticipated Next Quarter:

- Winter Flounder and Brook Trout models complete.
- Revised scope of work
- Work plan/timeline developed to perform remainder of project.

Expected End Date: January 31, 2015

Costs:

Total life to date expenses (include this quarter): $110,569.62

Total Approved Budgeted Funds: $250,000

Are you within the approved budget plan and categories? Yes

Signature: 

Date: August 7, 2014