Final Performance Report to The Nature Conservancy
TNC Fire Dependent Systems Project

Subaward Number: TNC-DNCR WRR-342020

Reporting Period Covered: 05/20/20 – 05/31/22

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NHB Project Manager: Sabrina Stanwood

NHB Project Lead: Chris Kane

Scope of Work from Attachment B on page 10 of signed Agreement
NH FIRE-DEPEND ECOSYSTEMS MAP

- TNC's Terrestrial Habitat Map for the Northeastern US and Atlantic Canada (or the LANDFIRE NVC Group map) will be prepared and used to create a distinct map of fire-dependent ecosystems in NH. (aka Objective 1)
- TNC's Terrestrial Habitat Types (or LANDFIRE NVC Group types) will be cross-walked to NHB system types. (aka Objective 2)
- Ground-truthing will be completed for up to 5 examples of each of the approximately IO fire dependent system types with follow up sampling as needed to improve the accuracy of the data. Existing data will substitute for ground-truthing where appropriate (i.e., when using existing data provides the same end result). Landowner research and contact will be conducted if ground-truthing is proposed on private lands. (aka Objective 3)
- The final spatial system or group dataset will be attributed with information about known fire return intervals, typical species composition, and diagnostic natural communities. (aka Objective 4)

Reporting Period 1 (5/20/20 to 12/31/20)
The following actions were completed by principal investigator Chris Kane, Associate Ecologist of the NH Natural Heritage Bureau during the project period 5/20/20 to 12/31/20.

The investigator participated in two online sessions regarding mapping by LANDFIRE VPU13 NVC hosted by Pat Comer of NatureServe. Participation included linking of raster output and table, review of the fire dependent systems mapping relevant to New Hampshire, discussion regarding suggestions by other participants in New England, and submission of comments for edits to the data for New Hampshire. He also participated in two online meetings of the NH Prescribed Fire Council. (Objective/Bullet 1 in the scope of work)

Systems / groups classification and map data from the LANDFIRE NVC Group Map and the TNC Habitat Map (Systems) were compared to determine which source would be the most appropriate to use as a basis for the project. The TNC Systems coverage was determined to be the best fit with the NH classification. The TNC raster data was subsequently converted to polygon format to provide a more

familiar/representative delineation of systems on the landscape, and to allow for editing. (Objective/Bullet 1 in the scope of work)

A review of the various classifications of fire prone/dependent systems/communities in sources including LANDFIRE, NatureServe Systems Classification, and the NH Natural Heritage Bureau informed the creation of a preliminary inclusive crosswalk of the pertinent subset of fire associated systems in New Hampshire. (Objective/Bullet 2 in the scope of work)

Field investigations of previously un-documented field sites with the potential to be suitable as fire dependent study sites were conducted at three locations in NH: Green Hills (Conway), Green Mountain (Effingham), and Hedgehog Mountain (Deering). Data collection included tree cores, plot data, photographs, and GPS tracks/points. (Objective/Bullet 3 in the scope of work)

No significant problems were encountered during the reporting period. The work on this project is on schedule, and progress toward project completion is on track. It is anticipated that project completion will occur according to the contracted schedule. The original principal investigator Chris Kane continues to have this role for the project.

Reporting Period 2 (1/1/21 to 12/31/21)
The following actions were completed by principal investigator Chris Kane, Associate Ecologist of the NH Natural Heritage Bureau during the project period 1/1/21 to 12/31/21. Assistance was provided by Amy Lamb and Bill Nichols at NHNHB.

Participated in two online meetings of the NH Rx Fire Council, during which we reported on progress with the project, which mostly entailed a summary of the crosswalk effort, but also included group discussions about the potential utility of the project final product. (Objective/Bullet 1 in the scope of work)

Continued a review and refinement of the crosswalk of fire prone/dependent systems/communities between the NatureServe Systems Classification and the NH Natural Heritage Bureau classification. (Objective 2)

Field investigations of previously un-documented field sites with the potential to be suitable as fire dependent study sites were conducted at eight locations in NH: Joe English Hill (New Boston), Mason Quarry (Mason), Gardner Easement (Hollis), Sheldrick Forest (Wilton), Downs Easement (Madison), Oak Hill (Concord), Winant Property (Concord), and Ball Property (Milton). Data collection included tree cores, plot data, photographs, and GPS tracks/points. (Objective 3)

For the display of the project results, different methods and platforms were considered. The first approach would have involved attributing the table behind the polygon data to include full system name, size, NH system equivalent, and fire characteristics including FRI. However, it was determined that this approach would limit access to users with ArcGIS software and capabilities, and that an online portal would be ideal. Several versions of their approach were considered before exploring the ArcGIS StoryMap platform. This option was researched and it became clear that to meet the needs and potential for this particular project, ArcGIS Online and ArcGIS Pro were necessary. Both licenses were obtained, and mockups of basic versions of a story map were created, including an interactive map and links to photos and descriptions of individual systems. This process continues into 2022. (Objective 4)

No significant problems were encountered during the reporting period. The work on this project is on schedule, and progress toward project completion is on track. It is anticipated that project completion will occur according to the contracted schedule. The original principal investigator Chris Kane continues to have this role for the project.

The following actions were completed by principal investigator Chris Kane, Associate Ecologist of the NH Natural Heritage Bureau during the project period 1/1/22 to 5/31/22. Assistance was provided by Amy Lamb, Pete Bowman, and Bill Nichols at NHNHB.

Participated in one online meeting of the NH Rx Fire Council, where Chris reported on progress with the project, which mostly entailed a summary of the GIS online portal in final draft form. Chris provided an online walk-through of the site and Fire Council members provided suggestions and responses about the potential utility of the project's final product. (Objective 1)

Continued a review and refinement of the crosswalk of fire prone/dependent systems/communities between the NatureServe Systems Classification and the NH Natural Heritage Bureau Systems Classification, as well as the LANDFIRE Classification. (Objective 2)

ArcGIS was selected as the clear preference as the platform to display and present the results of the project. Specifically, StoryMaps were tested as a possible platform, but limitations of format were realized early on. Instead, the ArcGIS Online Experiences platform was selected. Specifically, this platform allows for multiple levels of site links that are suitable for displaying the numerous pages of natural systems and communities that compose the subset of fire dependent ecosystems.

The design includes a main splash page with an interactive map of the fire dependent systems polygons in New Hampshire. The map is enabled for zooming and dragging and at a closer scale displays tax parcel boundaries. Both data layers are enabled for popup info boxes by clicking on a polygon. The main page also contains a list of the 15 Fire Dependent TNC Systems. These list items are hyperlinked to separate pages for each TNC system. Clicking on a system name opens a new tab and page for that system. Once at the system page level, the TNC system names are cross-walked to the corresponding NHB System(s).

In some cases, more than one NH system corresponds in part to a TNC system. In these cases, multiple NH systems are described in the same page. Each NH system description includes a list of the natural communities that are characteristic (diagnostic) of the system. Each listed community name is hyperlinked (by clicking it) to a separate page describing that community, with a narrative description and photo. Clicking a community name opens a new tab and page.

For the majority of the TNC systems mapped, predictive fire data was available from LANDFIRE. In these cases, a link to a separate table page was added to the system description block. This table displays all the fire dependent TNC and NH system names; *fire return intervals* for replacement, mixed, low, and all fire levels; *percent of all fire* at replacement, mixed, and low levels; and *fire regime group*. Each of these categories are described lower on the table page. (Objective 4)

A total of 51 web pages were created for this project: one main page, 15 TNC (NH) systems pages, 44 NH natural community pages, and one fire statistics page. Below is a link to the Fire Dependent Systems of NH site:

> FDS Site Main Page DRAFT (arcgis.com)

No significant problems were encountered during the project and the entire scope of work was completed on time and on budget. The work on this project is complete.