North Coast and Cascades Network Vegetation Mapping Project Annual Report 2009

Summary of major accomplishments in 2009:

- Published *Vegetation Classification of Mount Rainier, North Cascades, and Olympic National Parks* of *Plant Association Descriptions and Identification Keys* Natural Resource Technical Report NPS/NCCN/NRTR—2009/211
- Developed alliance to macrogroup units of National Vegetation Classification (NVC) for Mount Rainier (MORA), North Cascades (NOCA), and Olympic (OLYM) National Parks
- Ongoing mapping work at MORA demonstrated applicability of Light Imaging and Detection Radar (LiDAR) data to vegetation mapping
- Produced Resource Brief highlighting mapping work at MORA
- Initiated vegetation mapping at Lewis and Clark National Historic Park (LEWI)

Culmination of vegetationclassification work with the Washington Natural Heritage Program

In 2009 *Vegetation Classification of Mount Rainier, North Cascades, and Olympic National Parks Plant Association Descriptions and Identification Keys* Natural Resource Technical Report NPS/NCCN/NRTR—2009/211 was posted to the NPS internet site (http://www.nature.nps.gov/publications/NRPM/nrtr.cfm). The report provides descriptions of over 300 plant associations occuring in the three large wilderness parks in Washington. Dichtomous field keys, color photos, frequency-constancy tables, environmental information and state rarity are included. The classification analysis used plot data from over 900 NPS plots collected during the 2005-2007 field seasons in addition to several thousand plots collected for other studies.

Macrogroup through alliance levels of NVC as applied to the NCCN parks developed in cooperation with NatureServe

The vegetation classification at the association level provides an important reference for defining new units at the upper levels of the revised NVC hierarchy. New units defined from NCCN classification work must coordinate with regional and national reconceptualization of the NVC. At this time, 19 forested groups and 48 alliances and 17 non-forest groups and 38 alliances have been identified as occuring in the NCCN. Although concurrent with the MORA mapping, this work applies to mapping in the three large NCCN parks. NatureServe cooperators created field keys to the forested alliances and non-forested groups for the NPS field crew to use during this season's field sampling. Written descriptions for the new alliances and group concepts are being prepared by NatureServe.

Mapping work at Mount Rainier National Park Continues

Eric Nielsen, the remote sensing analyst with the Oregon Natural Heritage Information Center who is in charge of the NPS mapping work, has been providing the NPS field crews with guidance and field maps for their 2009 field season. For the base cartography, Eric has merged high resolution aerial photography (National Agricultura Imagery Program (NAIP)) with relatively coarser Landsat TM scenes to generate sampling polygons. Figure 1 below demonstrates the benefits of merging the two imagery sources.

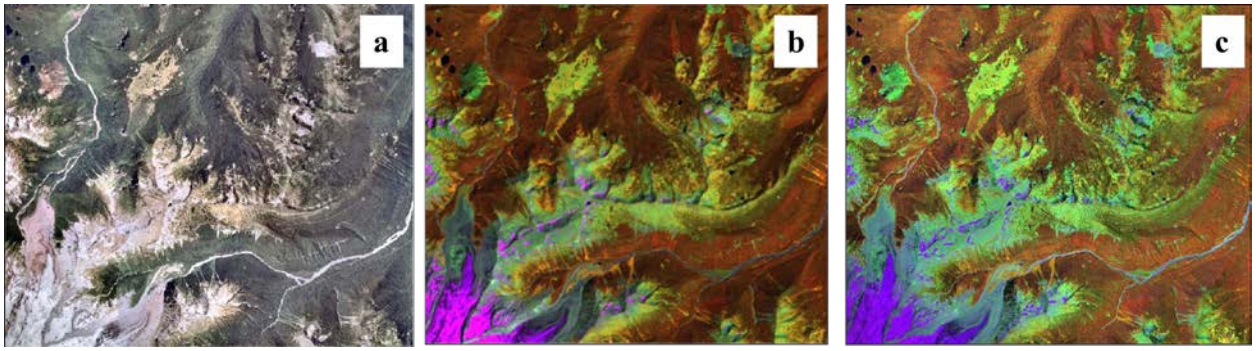

Figure 1. a) 2006 NAIP imagery has a high spatial resolution and many features can be seen on the image. b) Landsat TM image from July 2004- the spectral resolution is excellent but the 30 m pixels mean that the spatial resolution is not as good as the NAIP. c) the merged imagery pairs the spectral information from the Landsat TM with the high spatial resolution of the NAIP.

Eric is also taking advantage of recently-acquired LiDAR data for MORA to improve vegetation polygon delineation. Figure 2 below shows a forest-non forest mask generated from the 2008 MORA LiDAR data. The mask should improve the polygons derived from eCognition.

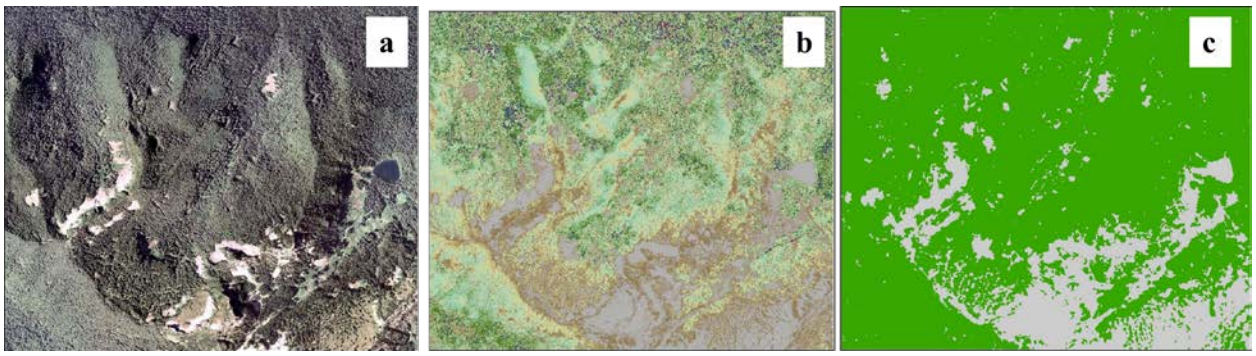

Figure 2. Example of application of LiDAR data to NPS mapping projects. a) 2006 NAIP imagery b) LiDAR derived height c) forest-non forest mask based on 5 m height cutoff. Green colored areas are forested, white areas are not.

The NPS field crew is completing the second and final field season of sampling for the MORA map classification. Field work in 2009 has focused on sampling areas above treeline in the park.

Mapping work at Lewis and Clark National Historic Park has begun

We have initiated vegetation mapping at Lewis and Clark National Historic Park (LEWI) via a cooperative agreement with the Oregon Natural Heritage Information Center. A variety of input imagery is available for LEWI, including Quickbird, NAIP, Landsat TM and LiDAR and Eric is evaluating and processing the imagery. An ONHIC field team has been conducting sampling this summer for both a vegetation inventory and a vegetation classification.

Future planning- FY10 and beyond

2010 Expected accomplishments:

- Alliance and Group descriptions from NatureServe
- MORA deliverables and roll-out meeting
- Draft vegetation classification for LEWI
- Initiation of OLYM mapping and first full OLYM field season
- Initiation of San Juan Island National Historic Park mapping (if funding available)

For mapping the large parks of the NCCN, we have created a collaborative team that combines NPS oversight and a four-person field crew with ONHIC technical team of Eric Neilsen, Jimmy Kagan and others. This approach is working well and we plan to continue to work together to map OLYM (FY 11-FY13) followed by NOCA (FY12-15). A written proposal and workplan for the OLYM mapping has been drafted by the ONHIC team. 1 m, 4 band NAIP imagery is being flown this year in late August and we plan to use this imagery as the base cartography for these two major mapping projects.

Mapping in the small parks of NCCN began this year with the work in LEWI mentioned above. In collaboration with Joe Rocchio, an ecologist at the Washington Natural Heritage Program, we have also drafted a proposal and workplan for mapping at San Juan National Historic Park. We are ready to embark on mapping in SAJH when funding is available. We will add Ebey's Landing (EBLA) and Fort Vancouver in such a way as to keep our annual network request stable.

The chart below outlines the current schedule for NCCN mapping through FY14. See NCCN_VegInventory_reporting.xlsx for budget estimates related to this plan.

	FY09		FY10		FY11		FY12		FY13	
Schedule	Autumn-Winter	Spring-Summer	Autumn-Winter	Spring-Summer	Autumn-Winter	Spring-Summer	Autumn-Winter	Spring-Summer	Autumn-Winter	Spring-Summer
MORA	*Classification*	*Field Data-Subalpine*	*Classification /AA*	*Report*						
OLYM (proposed)				*Image Processing, Field Data*	*Classification*	*Field Data*	*Map Classification*	*Classification /AA*	*Report*	
NOCA (tentative)							*Classification*	*Field Data*	*Classification*	*Field Data*
LEWI		*Imagery processing, field data*	*Veg classification*	*Image classification*	*Accuracy Assessment, Report*	*Report*				
SAJH (proposed)				*Field sampling*	*Classification*	*AA*	*Report*			

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