

Protocol Development Summary

Protocol: Distribution and abundance of high-priority invasive plant species

Parks Where Protocol will be Implemented: FOCL, MORA, NOCA, OLYM

Justification/Issues being addressed: Invasive plant species can disrupt ecosystem processes, preempt habitat for rare plants and other native plant species, eliminate food and habitat for native animals, create health and safety hazards, and damage cultural resources. Noxious weeds and other invasive plant species occur in all of the parks of the North Coast and Cascades Network. The proposed monitoring program will help direct and assess effectiveness of efforts to control invasive plants (e.g., the Exotic Plant Management Team), and identify newly emerging threats.

Specific Monitoring Questions and Objectives to be Addressed by the Protocol:

- 1) What is the distribution and abundance of high-priority invasive plant species in potential habitat at each park?
- 2) Which invasive plant species are emerging as potential threats to park ecosystems and where are they located?

Specific objectives of the protocol are:

- 1) Track changes in distribution and abundance of high-priority invasive plant species in areas identified as highly susceptible to establishment of those species (i.e. potential habitat). Distribution and abundance will be monitored every five years.
- 2) Detect incipient populations (i.e. small and localized) and new introductions of selected invasive plant species in potential habitat and track changes in cover of these populations.

Basic Approach: To accomplish the first objective, we will develop initial lists of the invasive exotic plants for each park that pose the greatest threat to natural and cultural resources. We expect to include on average eight invasive plant species per park. For each of these species, we will summarize existing information on distribution within the park, and other ecological data, to identify the set of potential habitat locations (including all known locations in the park). The collective list of potential habitat locations for all high-priority invasive plant species will constitute the population of monitoring sites for each park. Sites will be selected in a stratified-random manner from these populations of sites at each park, based on both accessibility and major habitat differences (e.g., road corridors vs. undisturbed forest). We will measure a total of 50 locations at FOCL and 250 locations in each of the 3 larger parks. At each location we will record the extent, number of stems, and cover of the target invasive species, plus the cover of all other vascular plant species present. The data will be summarized by species and park into the following indicators: proportion of sites occupied; mean spatial extent of populations; mean number of individuals per population; mean cover of the target species; mean cover of all invasive species; and mean cover of all native species. We will also obtain data on

control efforts by the Exotic Plant Management Team and other NPS personnel to use as a covariate in analyses of invasive species trends.

The proposed design results in 800 sampling locations across the network. We anticipate that working together, two people could average three locations per day. In a 12-week season, a four-person crew could then measure 288 locations, allowing for one office day per week. Although it would be optimal to visit all locations annually, we feel that it is more realistic to plan on one four-person crew. Thus we propose a five-year cycle, with one of the four parks each year, and no measurements one year out of five.

To accomplish the second objective, we will collate data from other monitoring modules that include vegetation (e.g., song-birds, riparian vegetation/aquatic habitat) and opportunistic observations such as backcountry logs. We will use these data to identify any invasive plant species that are either newly appearing in a park, or undergoing range expansion. We will also analyze observations of high-priority species to assess whether our descriptions of potential habitat for those species remain valid.

Principal Investigators and NPS Lead: The NPS leads will be Steve Acker, Mignonne Bivin, and Laurie Kurth. The PIs are to be determined.

Development Schedule, Budget, and Expected Interim Products:

The current activity is to develop a method for identifying potential habitat locations, using Olympic National Park as an example. The work will be accomplished through a CESU agreement with University of Washington.

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