Western Lily Survey Protocol September 10, 2008
Arcata Fish and Wildlife Office
Oregon Fish and Wildlife Office

Introduction

This protocol was designed for surveying areas where Federal or non-Federal activities may impact or remove western lily individuals or suitable habitat. The U.S. Fish and Wildlife Service (Service) endorses the use of this protocol for gathering information on western lily occurrences in proposed project areas for assessing affects of proposed actions. In cases where less intensive surveys are used to determine the presence of western lily, or level of impact, the Service necessarily will take a conservative approach (i.e. worst case analysis) in their assessment of impacts of the action on western lily. It is always useful to document reasons for not adhering to the recommended protocol.

This protocol should serve to ensure a high probability of locating western lily plants and to recognize suitable habitat that may be affected by a proposed management activity. This protocol is intended to apply to all habitats that could be occupied by western lily. However, changes in survey guidance may occur as new information and survey results become available.

Surveyor Qualifications

Surveyors should be able to recognize western lily juveniles and vegetative adults, in addition to recognizing suitable and potentially suitable habitat (Appendix A). To assist in identifying suitable habitat, the surveyor should be able to recognize commonly associated species in any growth stage, including: *Picea sitchensis* (Sitka spruce), *Pinus contorta* (shore pine), *Alnus viridis* var. *sinuata* (thinleaf alder), *Malus fusca* (Oregon crab apple), *Gaultheria shallon* (salal), *Ledum glandulosum* (Labrador tea), *Rhododendron occidentale* (white azalia), *Rubus spectabilis* (salmonberry), *Spiraea douglasii* (Douglas spirea), *Vaccinium uliginosum* (bog huckleberry), *Blechnum spicant* (deer fern), *Lotus formosissimus* (seaside birdsfoot trefoil), *Hypericum formosum* ssp. *scouleri* (western St. John's wort), *Maianthemum dilatatum* (false lily-of-the-valley), *Sanguisorba officinalis* (great burnet), *Carex obnupta* (slough sedge), *Calamagrostis nutkaensis* (Pacific reedgrass), *Deschampsia cespitosa* (tufted hairgrass), and *Holcus lanatus* (velvet grass).

One or more of the above species will usually be present in suitable habitat. Examples of the range of habitats that support western lily across its range between Humboldt County, California to Coos County, Oregon, within four miles of the coast, include:

- dense Sitka spruce forest, with little else present except scattered Pacific reedgrass and (*Polystichum munitum*) western swordfern;
- edge of degraded coastal prairie dominated by *Festuca arundinaceae* (tall fescue), velvetgrass, and *Salix hookeriana* (Hooker's willow);
- native coastal prairie dominated by Pacific reedgrass;
- coastal scrub dominated by Hooker's willow, Oregon crabapple, and salmonberry;
- freshwater wetland dominated by Labrador tea, slough sedge, and *Lysichiton*

americanus (skunk cabbage);
- freshwater wetland dominated by spiraea, and slough sedge;
- *Darlingtonia californica* (cobra lily) fen dominated by cobra lily, deer fern, and great burnett;
- current and former cattle or horse pasture dominated by salal, velvetgrass, and western swordfern.

Survey Timing

Survey timing varies according to relative location within the range of the western lily, and the intensity of the survey. Particularly when the species is not known from the site or within the general area (and when the survey intensity is likely to be relatively low), surveys should be scheduled during the optimal flowering period when visual detection of the plant is most likely. In general, from Crescent City northward to Coos Bay, Oregon, the optimal survey period is the month of July; south of Crescent City, California the optimal survey period is June 15 – July 15. However, surveys should never rely strictly on presence of flowering individuals. Frequently many if not all flowering-capable individuals within a population are grazed prior to the peak flowering period.

Surveys conducted within known or nearby known occupied sites should be conducted at greater intensity, and therefore may have more leeway in terms of the survey timing. Such surveys will give less emphasis to presence of flowering individuals, and involve more time per unit area searching for juvenile or grazed individuals. Since on many sites the species does not emerge above ground until mid-late April (seedlings on average emerge slightly earlier), and plants often begin dying back by mid-late August, even the most intensive surveys should not be conducted before May 1 and after August 15.

Survey Frequency

A complete western lily survey for a specific area need only be performed once if conducted during the proper time and intensity level. Surveys are considered valid for a period of 5 years.

Survey Intensity

The level of survey intensity varies based on whether the survey will be conducted *at*, *near*, or *well away* from an occupied lily site. For each survey effort, all suitable habitat in an area should be examined.

Surveys at known occupied sites, where the intent is to define occupied habitat, should be conducted at the highest intensity, suitable to detect all small juvenile plants. In these cases, the surveyor must either be well experienced in recognizing suitable habitat, or define suitable habitat very broadly. Occupied habitat would be determined by working slowly outward from known individuals, inspecting <u>all</u> ground surfaces regardless of the density or composition of vegetation cover, until the habitat is deemed unsuitable based on soil, hydrology and vegetation characteristics. In general, the intensity should be sufficient to recognize presence of single leaf juveniles measuring less than one or two inches in height. The pace of these surveys is

typically slow and will involve more crawling or stooping to check for juvenile plants within the vegetation undergrowth. The duration of the survey will vary depending on site-specific vegetation density, survey acreage, and the amount of staff-hours. Depending on vegetation type, one surveyor should be able to cover approximately one acre of western lily suitable habitat in a day with this level of intensity.

The appropriate intensity for surveys of suitable or potentially suitable habitat near to occupied habitat (for example, within 10 miles) would be less than for known occupied habitat, but adequate to detect juveniles or grazed individuals greater than 2 feet tall, 100 percent of the time. This survey method involves careful scanning of vegetation for western lily flowers while slowly walking, periodically kneeling or stooping, and crawling through the site to check the vegetation undergrowth for juvenile plants. The amount of time should be enough to carefully scan above and within all of the vegetation strata, but will vary depending on site-specific vegetation density, survey acreage, and the amount of staff-hours. With this survey intensity level, one surveyor on average should be able to cover approximately four acres of western lily suitable habitat in a day.

The appropriate intensity for surveys of suitable habitat or potentially suitable habitat well away from known occupied habitat (e.g., greater than 10 miles) would be such that all flowering plants would be encountered. With this level of intensity there is less than 50 percent chance that any non-flowering juveniles, or grazed individuals measuring greater than 2 feet in height would be detected. This survey method can be conducted by slowly walking through suitable habitat, scanning the vegetation strata for flowering plants, and occasionally peering though the vegetation undergrowth for juveniles. With this intensity level, one surveyor should be able to cover approximately 8 acres of western lily suitable habitat in a day.

Data Collection and Reporting

Data collected depends on the intent of the survey. In all cases, the location of any western lilies encountered should be mapped or otherwise documented sufficient to enable relocation. Individuals may be mapped on aerial photographs or hand drawn maps showing distances to visible landmarks, recorded GPS coordinates, or mapped in reference to fixed transects or survey points. If the entire population is not censused, an estimate of the population should be made. Other useful information to record includes: phenological condition and number of flowers or fruits; grazed status; plant height; information about habitat (e.g., dominant species composition, cover, and height, by vegetation layer); soil type, texture and moisture level.

Where a boundary between occupied and unoccupied habitat has been determined, notes should be made in support of the determination that habitat is unsuitable. A final report should be provided to the Service that includes locations and numbers of adult and juvenile western lilies found, occurrence habitat descriptions including data, and mapped suitable, potentially suitable, and non suitable western lily habitat. Oregon Natural Heritage Information Center or Natural Diversity Database forms should be filled out for any new occurrences or to update existing occurrences.

Appendix A. Western lily life-stage and habitat photos

- Western lily (*Lilium occidentale*) Full bloom

- Western lily early blooming stage

- Western lily habitat

- Western lily with Douglas spirea

- Stem and leaves of western lily

- First-year juvenile western lily

- Western lily growing through braken fern