

**Recovery Plan for Western Lily (*Lilium occidentale*)**

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**Original Approved:** March 31, 1998

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**DRAFT AMENDMENT 1**

We have identified best available information that indicates the need to amend recovery criteria for western lily (*Lilium occidentale*) since the Recovery Plan was completed. In this proposed modification, we synthesize the adequacy of existing recovery criteria, show amended recovery criteria, and provide the rationale supporting proposed Recovery Plan modifications. The proposed modification is shown as an addendum that supplements the Recovery Plan, superseding only page iii of the Recovery Plan.

**For  
U.S. Fish and Wildlife Service  
Pacific Southwest – Region 8  
Sacramento, CA**

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**METHODOLOGY USED TO COMPLETE THE RECOVERY PLAN AMENDMENT**

The U.S. Fish and Wildlife Service (Service) reviewed the available literature, most recent 5-year Status Review, and information from California Department of Fish and Wildlife, Oregon State Parks, Oregon Department of Agriculture, and the Wiyot Tribe to determine criteria for removing western lily from the list of threatened and endangered species. This review represents an individual effort; however, valuable input and feedback from colleagues and partners was incorporated throughout. We relied on the current Recovery Plan and most recent 5-year status review, as each document is comprehensive in describing the biology of and threats to western lily.

**ADEQUACY OF RECOVERY CRITERIA**

Section 4(f)(1)(B)(ii) of the Endangered Species Act (Act) requires that each Recovery Plan shall incorporate, to the maximum extent practicable, “objective, measurable criteria which, when met, would result in a determination...that the species be removed from the list.” Legal challenges to Recovery Plans (see *Fund for Animals v. Babbitt*, 903 F. Supp. 96 (D.D.C. 1995))

and a Government Accountability Audit (GAO 2006) have also affirmed the need to frame recovery criteria in terms of threats assessed under the five threat factors (Act 4(a)(1)).

## **Recovery Criteria**

The current recovery criteria can be found on page iii in the Recovery Plan (see link above).

## **Synthesis**

Western lily is an endangered, long-lived, perennial plant species that relies on early-successional, coastal habitat (Service 1998). In the Recovery Plan for western lily, the Service identified criteria necessary for downlisting the species to threatened status; however, no criteria were identified for delisting the species. In the most recent status review, no change in listing status was recommended (Service 2009). Since the 2009 review, new information regarding population occurrences, habitat extent and quality, and threat prevalence has been obtained. Although this information is pertinent to western lily recovery, it is relevant to assessing the adequacy of current recovery criteria. This new information will be available in the forthcoming status review in 2019.

## **AMENDED RECOVERY CRITERIA**

Recovery criteria serve as objective, measurable guidelines to assist in determining when an endangered species has recovered to the point that it may be downlisted to threatened, or that the protections afforded by the Act are no longer necessary and the species may be delisted. Delisting is the removal of a species from the Federal Lists of Endangered and Threatened Wildlife and Plants (here forward, Lists). Downlisting is reclassification of a species from an endangered species to a threatened species. The term “endangered species” means any species (species, sub-species, or Distinct Population Segment [DPS]) which is in danger of extinction throughout all or a significant portion of its range. The term “threatened species” means any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Revisions to the Lists, including delisting or downlisting a species, must reflect determinations made in accordance with sections 4(a)(1) and 4(b) of the Act. Section 4(a)(1) requires that the Secretary determine whether a species is an endangered species or threatened species (or not) because of threats to the species. Section 4(b) of the Act requires that the determination be made “solely on the basis of the best scientific and commercial data available.” Thus, while Recovery Plans provide important guidance to the Service, States, and other partners on methods of minimizing threats to listed species and measurable objectives against which to measure progress towards recovery, they are guidance and not regulatory documents.

Recovery criteria should help indicate when we would anticipate that an analysis of the species’ status under section 4(a)(1) would result in a determination that the species is no longer an endangered species or threatened species. A decision to revise the status of or remove a species from the Lists, however, is ultimately based on an analysis of the best scientific and commercial data then available, regardless of whether that information differs from the Recovery Plan, which

triggers rulemaking. When changing the status of a species, we first propose the action in the *Federal Register* to seek public comment and peer review, followed by a final decision announced in the *Federal Register*.

We provide both downlisting and delisting criteria for the western lily, which will supersede those included in *Final Recovery Plan for the Endangered Western Lily* (*Lilium occidentale*), as follows:

### **Downlisting Recovery Criteria:**

The western lily can be considered for downlisting to threatened when at least 20 viable populations are protected and managed to assure their continued existence. The 20 populations must be distributed among six recovery areas, with at least three in Area 1, five in Area 2, and four each in Areas 4, 5, and 6. For the purposes of this Recovery Plan, a viable population includes at least 1,000 flowering plants, and a population structure indicating stable or increasing plant numbers.

These criteria remain the same as detailed in the existing Recovery Plan. However, the number of recovery populations specified per recovery zone were not stated in the “Recovery Criteria” section on page iii of the Recovery Plan, but were detailed in the “Criteria for reclassification to threatened status” section on page 21. These specifications are now included in the downlisting criteria for clarity.

### **Delisting Recovery Criteria**

The western lily should be considered for delisting when the criteria for downlisting are fulfilled, with the following additions:

1. Trends at each of the 20 populations are determined to be stable or increasing for a minimum of 25 years. Trend determination will be based on the number of flowering (reproductive) individuals present.

Justification: We carried forward the same number of populations required for downlisting (n=20), as well as the requirement for each recovery population to have 1,000 flowering individuals in order to conserve the majority of the remaining genetic diversity. A population of 1,000 flowering individuals is presumed to be resistant to deleterious mutations as well as browsing pressures by deer (Lynch et al. 1995; Service 1998). Furthermore, to conserve the genetic diversity, as well as provide redundancy among recovery areas, these populations should be distributed among recovery areas in a manner similar to the historical distribution of western lily populations. A threshold value of 25 years is biologically informed by the lifespan of individual lilies (Kline 1984). This time period allows the Service to evaluate trends over one full generation of this long-lived perennial plant. Plants may take 4-5 years to flower for the first time (Schultz 1989), and may live past 25 years (Kline 1984). Thus, we determined that delisting will require stable or positive trends for at least 25 years (i.e., approximate lifetime of one generation). Additionally, this information informed our determination that post-delisting monitoring should occur for at least 12 years (i.e.,

approximately one-half of a generation). In the original Recovery Plan, downlisting criteria stated that there should be at least 20 viable populations in order to consider downlisting to threatened. We carried this forward to the downlisting criteria because it adequately and directly addresses the need for redundancy for the species. These trends will be determined using a standardized methodology across all sites, which will focus on the inventory of each flowering plant. The stable or increasing trends will be evaluated as “overall” trends to account for natural variability that may result in short-term declines in the population.

2. A minimum of 20 viable populations are appropriately managed through either long-term landowner agreements (e.g., stewardship plans, easements, or memorandums of agreements), which identify maintenance of *Lilium occidentale* habitat as a primary management objective for the site or permanent conservation easement/covenant that commits both present and future landowners to the conservation of *Lilium occidentale*.

Justification: Western lily is a long-lived perennial plant that requires early-successional habitat to successfully reproduce (Service 1998). Anthropogenic influence has altered natural disturbance regimes that maintained suitable habitat conditions for western lily (Service 1998). Therefore, protection of western lily habitat alone is not sufficient to ensure recovery. In the absence of natural disturbance regimes, active management to maintain habitats in an early-successional state through intermediate disturbance is necessary for western lily populations to reproduce. The need for such agreements, plans, easements, or memoranda of agreements is supported by the habitat needs of the species. Without the commitment to and implementation of this management, western lily habitat is expected to degrade and become unsuitable for lily reproduction. Populations may consist of multiple, geographically proximal locations. This will allow smaller sites to be combined to achieve the 1,000 flowering plants criterion.

3. A monitoring plan to cover a minimum of 12 years post-delisting of *Lilium occidentale* has been approved by the Pacific Southwest Regional Director and is ready to be implemented at the time of delisting to ensure the ongoing conservation of the species and the continuing effectiveness of management actions.

Justification: A threshold value of 12 years is a biologically-informed threshold because it is one-half the lifespan of individual lilies (Kline 1984). This provides monitoring efforts for one-half of a generation of this long-lived perennial plant, which will allow the Service to detect slowly declining rates.

### **Rationale for Amended Recovery Criteria**

Providing delisting criteria guides the path to recovery for listed species. These amended criteria fit within the current context of the Recovery Plan as they expand upon existing downlisting criteria and reinforce the needs of western lily as detailed in the Recovery Plan. Together, these newly detailed delisting recovery criteria address Factors A–E of the Service’s Five-Factor Analysis Framework. Factor A will be addressed because the Service and its partners will be able to assess the success of habitat management for western lily on biologically relevant time-scales. The criteria will also address Factor A by including management of habitat in perpetuity. Factor

B will be addressed because the protection of western lily habitat will curtail attempts to collect the plants, as well as provide a permitting pathway for scientific studies. Factor C will be addressed through management practices that exclude or discourage floral predation by browsing deer. Factor D is addressed through inclusion of conservation agreements, which will afford the western lily protection on private lands. This is relevant because Oregon populations currently are not protected on private lands at the State level or Federal level. The Service defines Factor E as “Other Natural or Manmade Factors Affecting (western lily’s) continued existence.” In the 2009 status review, the three threats identified under Factor E included non-native plants, small population size, and climate change. The newly detailed delisting criteria would address Factor E through implementation of management agreements that will remove non-native plants, which compete with western lily, as well as manage sites to connect small populations, where practicable.

When practicable, habitat restoration activities should seek to facilitate genetic exchange between populations that are in close geographic proximity. This increases the likelihood of populations withstanding stochastic disturbance events that exceed the disturbance tolerance of the species. In addition, by protecting and managing populations throughout the range of the species, these recovery criteria address the need for representation of the species in multiple habitat types and along a latitudinal gradient. Representation of the species within different habitat types and latitudinal gradients will increase the likelihood of some populations withstanding changing environmental conditions, as well as preserving genetic diversity across the populations.

## LITERATURE CITED

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