

1.11 Salt Marsh Bird's-Beak (*Chloropyron maritimum* ssp. *maritimum*) – Category SL

Management Units with Known Occurrences

Salt marsh bird's-beak is a hemiparasitic annual plant found in the upper tidal zones of coastal salt marshes in central and southern California and northern Baja California, Mexico (USFWS 2009). Three life history characteristics affect the distribution: (1) annual habit, (2) hemiparasitic mode of nutrition, and (3) the fact that it is a halophyte (a salt-tolerant plant). Within a given marsh, the distribution of salt marsh bird's beak depends upon the local dispersal of its seeds, the distribution of potential host plants, and the annual environmental conditions. It typically grows with species of *Salicornia*, *Distichlis*, *Frankenia*, *Suaeda*, and *Atriplex* in the higher areas (Purer 1942). Salt marsh bird's beak generally grows in areas of low rainfall and high evaporation rates, with little or no summer rainfall and highly seasonal stream flows (Zedler et al. 1986).

Conserved Lands in the MSPA support 7 occurrences of salt marsh bird's-beak (see Table of Occurrences). There are 6 large ($\geq 1,000$ plants) occurrences in MU1: Tijuana Estuary (3 occurrences), Sweetwater Marsh (2 occurrences), and Dog Beach (MSP-MOM 2014). There are 4 small ($< 1,000$ plants) in MU1 at the Tijuana Estuary, Tijuana Slough, San Diego Bay, and Camp Surf. There is also 1 occurrence of unknown size at the Tijuana Estuary (see online map: <http://arcg.is/2iBC8oe>).

Management Categorization Rationale

Salt marsh bird's-beak should be managed as a Species Management Focus Category SL Species due to a moderate risk of loss from Conserved Lands in the MSPA and because managing salt marsh vegetation alone will not ensure persistence of the species (see Vol. 1, Table 2-4). This species faces a moderate risk of loss due to its restricted distribution to salt marshes in only MU1 in coastal south San Diego County. It is also vulnerable because of high risk of threats and an annual, hemiparasitic life cycle (see Vol. 3, App. 1, Species Profiles).

Salt marsh bird's-beak faces a multitude of threats. Small and isolated occurrences are already showing low genetic diversity, with the loss of rare alleles as a result of genetic drift leading to potential reductions in fitness (Helenurm and Parsons 1997; USFWS 2009). Small occurrences restricted to limited upper tidal marsh habitat are also vulnerable to extirpation from stochastic events and catastrophic disturbances.

Invasive nonnative plants, particularly curved hard grass (*Parapholis incurva*) and annual beard grass (*Polypogon monspeliensis*), affect growth and productivity of salt marsh bird's-beak occurrences (Fellows and Zedler 2005). Other factors affecting plant growth and reproductive potential include drought and seed herbivory by the salt marsh snout moth (*Lipographis fenestrella*; Parsons and Zedler 1997). Ongoing altered hydrology and sediment dynamics associated with urbanization are converting intertidal salt marshes to upland habitats decreasing the habitat available to salt marsh bird's-beak (Callaway and Zedler 2004; Zedler and West 2008). The species' life history as a semiparasitic annual plant increases the risk of occurrence loss (USFWS 2009). Off-highway vehicle activities threaten the southernmost occurrences, although this threat has been reduced by implementation of specific management measures.

Climate change is expected to eliminate some suitable habitat through inundation with rising sea levels (USFWS 2009). At more protected sites, tidal surges are expected to increase soil salinity, which in combination with more frequent, prolonged and intensive droughts could produce conditions limiting salt marsh bird's-beak growth and reproduction.

Management and Monitoring Approach

The overarching goal for salt marsh bird's beak is to maintain or enhance existing occurrences and create salt marsh to establish new occurrences to reduce risk of population loss to rising sea levels and to ensure multiple conserved occurrences with self-sustaining populations to increase resilience to environmental and demographic stochasticity, maintain genetic diversity, and ensure persistence over the long term (>100 years) in salt marsh vegetation communities.

For the planning cycle of 2017–2021, the management and monitoring approach is to:

- (1) Annually inspect salt marsh bird's-beak occurrences on Conserved Lands (see Table of Occurrences) using the regional rare plant IMG monitoring protocol to record abundance and collect habitat and threats covariate data to determine management needs and conduct routine management actions as identified.

- (2) Complete the study begun in 2016 to characterize the population genetic structure, gene flow, and genetic diversity for salt marsh bird's-beak occurrences (see Table of Occurrences).
- (3) Develop models predicting habitat suitability under future climate scenarios and combine the habitat models with projected increases in sea level and urban development to evaluate and prioritize sites for establishing new occurrences of salt marsh bird's-beak.
- (4) Prepare a salt marsh bird's-beak section in the MSP Rare Plant Management Plan that prioritizes management actions to maintain and enhance large occurrences, enhance and expand ≥ 3 small occurrences, and establish ≥ 1 new occurrence on Conserved Lands (see Table of Occurrences). Begin implementing high-priority actions for salt marsh bird's-beak from the MSP Seed Collection, Banking, and Bulking Plan to collect and store seeds at a permanent seed bank and to provide propagules as needed for management-oriented research, existing population enhancement, and establishment of new occurrences. Collect salt marsh bird's-beak seed for conservation banking.
- (5) Prepare a salt marsh bird's-beak section in the MSP Seed Collection, Banking, and Bulking Plan that incorporates best science and management practices (Royal Botanic Gardens, Kew 2001; Wall 2009) to preserve genetic diversity and rescue occurrences in case of catastrophic disturbance. Begin implementing highest-priority management actions identified for salt marsh bird's-beak in the MSP Rare Plant Management Plan and monitor effectiveness of implementation.

For details and the most up-to-date goals, objectives, and actions, go to the MSP Portal Salt Marsh Bird's-Beak summary page: https://portal.sdmmp.com/view_species.php?taxaid=834234.

Salt Marsh Bird's Beak References

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