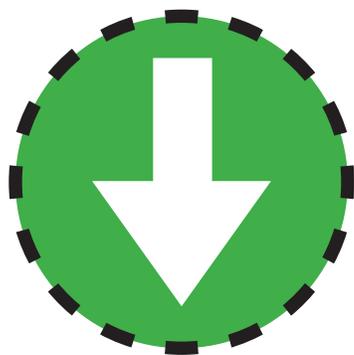


# OSPREY

*Pandion haliaetus*



**Condition: Good**

**Trend: Declining**

**Confidence:  
Moderate**



## WHY IS THIS RESOURCE INCLUDED?

Ospreys are a charismatic and iconic raptor species that breeds in the lakes and reservoirs in the One Tam area of focus. Because Osprey feed almost exclusively on fish, breeding success is a good indicator of water quality and fish abundance. The Kent Lake Osprey colony was first established in the mid-1960s and has been monitored continuously by the Marin Municipal Water District (MMWD) since 1981, making it one of the longest-running Osprey nesting studies in the Pacific region.

## OVERALL CONDITION

Osprey were once listed as a California species of special concern as a result of population declines caused by persecution and environmental contamination in the 19th and early 20th centuries. Because of their sensitivity to environmental perturbations, the Osprey is now considered an ideal Worldwide Sentinel Species. Over the last several decades, the United States' Osprey population has recovered from historic declines, but they are still protected by the Migratory Bird Treaty Act.

After experiencing two decades of growth following its establishment with the filling of Kent Lake, the Osprey colony peaked in the mid-1990s, then entered a period of gradual decline over the subsequent two decades.

Recent monitoring suggests the colony is currently about half of its former size. However, west of Kent Lake (Inverness Ridge) and elsewhere in the San Francisco Bay Area, the number of active Osprey nests have increased over the same period. Therefore, as the local colony has declined, the regional population has grown substantially. In other words, the Kent Lake was the founding colony that likely contributed to the overall growth of the regional population.

The causes of the decline seen at Kent Lake are unknown, but may be multifaceted. Possible explanations include: a

shift in regional nesting distribution; response to a pair of nesting Bald Eagles (*Haliaeetus leucocephalus*) at Kent Lake starting in 2008; changing ecological conditions affecting fisheries and foraging success; a response to changes on the Osprey’s wintering grounds; and changing patterns of recruitment in the nesting colony.

The current benchmarks for Kent Lake Osprey are:

- Average number of active nests from 2003–2015 was 26.7

Note: Occupied nests are defined here as nests that are maintained by the adults up to egg-laying. Active nests are those that persist into the incubation phase. Successful nests are those that fledge at least one young.

- Maximum count of active nests in 1994 was 46
- Average number of occupied nests from 2003–2015 was 37.4
- Maximum count of occupied nests in 1994 was 52

## DESIRED CONDITIONS

A healthy nesting population of Osprey on Mt. Tam would remain stable over time. High levels of pair occupancy and annual reproductive success would be maintained within the normal range of variability, or above long-term average values based on recent historical monitoring.

## STRESSORS

**Climate Change:** Ospreys require large, open bodies of water for both nesting and foraging. Extended periods of drought may result in dramatic and sustained drops in lake levels that may negatively impact Osprey fledging success. However, the effects will depend on impacts to fish populations, as an increase in shallow water habitat may actually improve prey availability if fish populations are maintained.

**Contaminants:** Osprey populations were impacted by contaminants (primarily chlorinated hydrocarbons, but also mercury) in the mid-20th century. Kent Lake Osprey are still potentially threatened by contaminants in nearby areas where they are known to forage. For example, Residues of DDT are still documented in the northern San Francisco Bay Area also documented above sub-lethal levels of mercury in more than one quarter of 3,000 fish sampled in the San Francisco Bay.

## METRICS AND GOALS

Metric	Condition Goal(s)	Status
<b>Metric 1</b> Measures of reproductive effort	Reproductive effort (number of occupied nests and occupancy rate) remains within the range of values recorded over the last decade	
<b>Metric 2</b> Annual reproductive success	Annual reproductive success is in the range of 0.8–1.3 chicks per nest per year, or higher	
<b>Metric 3</b> Habitat	Continued availability of suitable nesting sites provided by a mix of live and dead standing trees, particularly coast redwood	

## INFORMATION GAPS

**Reproductive Success:** Increasing annual observations to determine productivity

**Prey Ecology:** Foraging patterns and locations and prey availability are not well known, nor are the local ecological dynamics of prey species (e.g., top smelt). Kent Lake Osprey are known to hunt in adjacent lakes (e.g., Bon Tempe), along the outer coast (e.g., Bolinas Lagoon) and in the San Francisco Bay, but there are few observations of foraging in Kent Lake. California Department of Fish and Wildlife fish stocking is a potential source of data for Bon Tempe Lake, but Kent Lake Osprey forage more broadly than Bon Tempe. No other data are currently available.

**Chemical Threats:** Sampling for mercury and other contaminants has not been conducted.