

# Map of Ecola State Park Study Area, Oregon

2025

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Ecola State Park Landslide Risk Analysis, Clatsop County, Oregon

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PLATE 1

## Introduction

Oregon's state parks are treasures that make Oregon an ideal place to live and explore. Ecola State Park (Ecola) is located on the northern Oregon Coast in Clatsop County between the cities of Seaside and Cannon Beach. Landslide hazards have plagued Ecola since its designation in 1932.

The purpose of this project is to evaluate the current and future landslide susceptibility and risk within and surrounding Ecola to assist the Oregon Parks and Recreation Department (OPRD) in making decisions to reduce landslide risk, with an emphasis on roadways. Landslide susceptibility is the relative likelihood of the landslide hazard occurring in a certain portion of the study area. Landslide risk is the possibility of damage or losses to assets (people, infrastructure, and the environment) by the hazard. To accomplish this goal, several tasks were performed:

- A new lidar topography dataset was collected in 2023.
- The distribution of landslides was mapped throughout the park.
- A new/updated geologic map of the park was created.
- Existing and future landslide susceptibility was analyzed.
- Recommendations for future risk reduction were provided.

Landslide susceptibility and risk were analyzed using several methods, including:

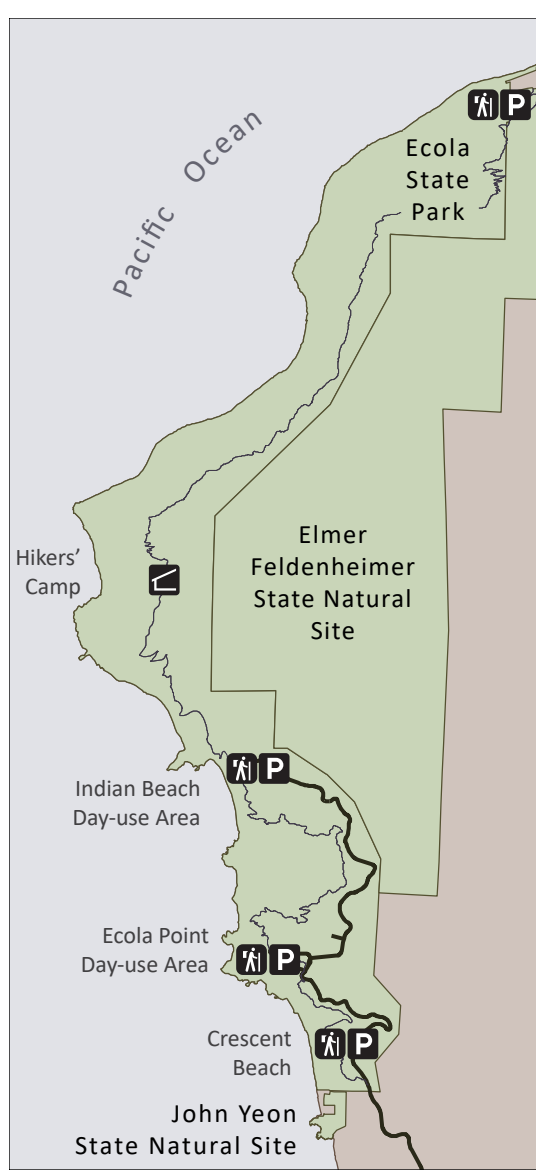
- Landslide inventory: an inventory of contemporary and historic landslide activity was created by examining the 2023 topographic lidar dataset.
- Serial lidar change analysis: landslide activity was identified by examining changes in the topography during a window of time using lidar datasets (2023 and 2009).
- Serial orthophoto change analysis: landslide activity was identified by examining changes in the vegetation and other visual details using multiple orthorectified aerial images spanning 1939 to 2022.
- Geologic mapping: geologic mapping data from the region was collected, corroborated and further investigated with several field days during this study, and combined to build a robust geologic map that can be used in the development of a landslide susceptibility map and provide additional understanding of landslide mechanisms.

Finally, landslide inventories, geologic mapping data, and modern topography were combined to create a susceptibility and risk map that classifies every portion of the study area into one of the seven susceptibility zones, from None to Low to Active susceptibility of future landslide activity and risk of damage and losses to existing infrastructure. Each zone includes an estimate of past landslide-recurrence activity (e.g., every ~50 years to 150 years) and recommendations for future development to reduce risk.

## Location Map



## Park Boundary Map



**Source Data:**  
Oregon Lidar Consortium (OLC) one-meter digital elevation model for Ecola State Park and surrounding area. Water features from USGS National Hydrologic Dataset (NHD) (2017). Road features outside of the park from Oregon Department of Transportation (ODOT) (2013) or digitized by Oregon Department of Geology and Mineral Industries (DOGAMI) from 2022 orthophotos. Park infrastructure GIS data (transportation corridors, recreation point locations, transportation structures) from Oregon Parks and Recreation Department (OPRD) (2023). Building footprints from DOGAMI Statewide Building Footprints for Oregon (SBFO) Release 1.1 (2023). Additional place locations from US Geological Survey, Geographic Names Information System (GNIS) (2008). Orthophoto imagery (2022) from Oregon Statewide Imagery Program (OSIP).

**Projection:**  
Oregon Statewide Lambert Conformal Conic, Unit: International Feet, Horizontal Datum: NAD 1983 2011.

**Software:**  
Esri ArcGIS Pro v3.3.1, ArcGIS Pro v10.7.1, and Adobe Illustrator® 2024 v28.6

**References:**  
Calk, B. Park Manager Oregon State Parks Nehalem Bay Management Unit, pers. comm. October 2024.

Oregon Parks and Recreation Department (OPRD). 2024. Ecola State Park. Near Seaside, Oregon, United States. <https://stateparks.oregon.gov/index.cfm?do=stateparkprofile&parkid=136>

**Digital Cartography:**  
Jon J. Franczyk, DOGAMI

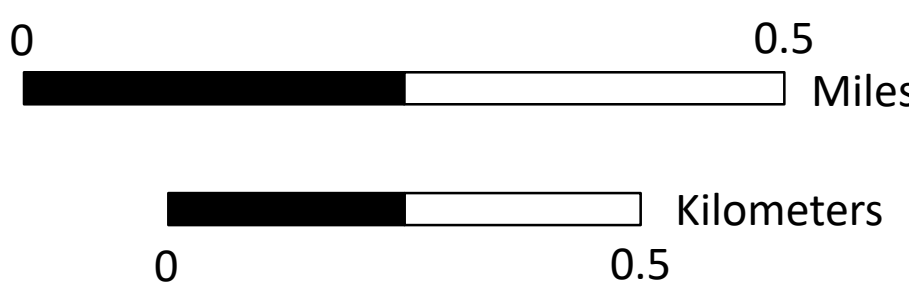
## History of the Park

In 1806, Captain William Clark of the Lewis and Clark Expedition was looking south from Tillamook Head, and described the view as the "grandest and most pleasing prospect he had ever surveyed" (Clark, 1806). The land that makes up Ecola was acquired by the State of Oregon between 1932 and 1978 by gift and purchase from private owners and the federal government. The original tract was 451 acres at the south end of modern Ecola, near Cannon Beach. Later, additional land was acquired to the north and east, including Tillamook Head and extending to Seaside. Ecola was developed between 1934 and 1941, with construction of roads, picnic facilities, trails, offices, workshop and a caretaker's house.

Ecola is located very close to the intersection of Oregon State Highways 26 and 101 in Clatsop County. Ecola is directly adjacent to Elmer Feldenheimer State Natural Area (east of Ecola), which is currently undeveloped. This project's study area includes both OPD properties as well as a portion of private land between the state lands and Highway 101.



SCALE 1: 8,000



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