

PORTLAND GENERAL ELECTRIC  
BOARDMAN TERRESTRIAL MONITORING PROGRAM

A. INTRODUCTION

The Boardman Coal-Fired Generating Plant is located approximately 12 mi. (19 km) southwest of the town of Boardman in Morrow County, Oregon. The 585 MW plant burns low-sulfur, sub-bituminous, western states coal and began commercial generation of electricity in August 1980. The site occupies a plain, Poverty Ridge, about 690 ft above mean sea level and includes Carty Reservoir, a 1,400-ac industrial waste treatment, cooling, and irrigation storage pond.

The surrounding area is characterized as semi-arid with a shrub-steppe vegetation community. Vegetation of the region is dominated by sagebrush (*Artemisia*), rabbit brush (*Chrysothamnus*), and cheat grass (*Bromus*). In undisturbed areas, native perennial bunchgrasses are also present. Much of the area near the Plant also supports irrigated farmland, managed for crops such as wheat, potatoes, alfalfa, mint, and corn. Carty Reservoir, which has a volume of 38,500 ac-ft, is surrounded by an extensive riparian community.

Environmental impacts from operation of the plant have been minimized by the best practical design and utilization of high-efficiency pollution control systems. Primary areas of environmental concern include:

- Plant stack emissions containing oxides of nitrogen and sulfur,
- Trace elements associated with airborne particulate matter,
- Fugitive particulates from ash disposal sites and coal-handling areas,
- Creation of an extensive water environment and corresponding impact to ecology of the region.

To monitor these concerns, the Boardman Environmental Monitoring Program was initiated in 1979 in accordance with the Oregon Administrative rules, the Boardman Water Pollution Control Facilities Permit, and the Boardman Site Certificate. The initial monitoring program was modified, with EFSC approval, in 1983 and again in 1988. In 1997, bird census protocol was modified to reflect the areas of emphasis and the methodology popular with the resource agencies. The surveys were changed to focus more on breeding species and nesting habitats associated with shrub/steppe and riparian areas.

The entire program was again evaluated in 2003 by resource agency and PGE personnel. As a result of that review, the scope of both the terrestrial and water quality programs was modified, and the two programs will be reported on as separate entities. [In March 2020, annual aerial photography monitoring was discontinued and removed from the program because 40 years of monitoring had revealed no observed impacts from plant emissions other than dispersion of coal](#)

[dust and raw biomass on PGE property to the east of the coal yard, and the Boardman Coal Plant was scheduled to cease electricity generation in late 2020.](#)

This document describes the [remaining](#) terrestrial elements of the monitoring program, which are reported annually under OAR 345-26-075.

## B. MONITORING PROGRAM

### 1. Breeding Bird Surveys

As per the survey modifications implemented in 1997, the breeding bird surveys are conducted once per month in April, May, and June using the point count method. Surveys are conducted in grassland, sagebrush, and riparian habitats. Emphasis is on documenting the relative abundance and distribution of breeding landbird species in all three habitat types. Annual survey data are used to compare trends in landbird species diversity and abundance over time.

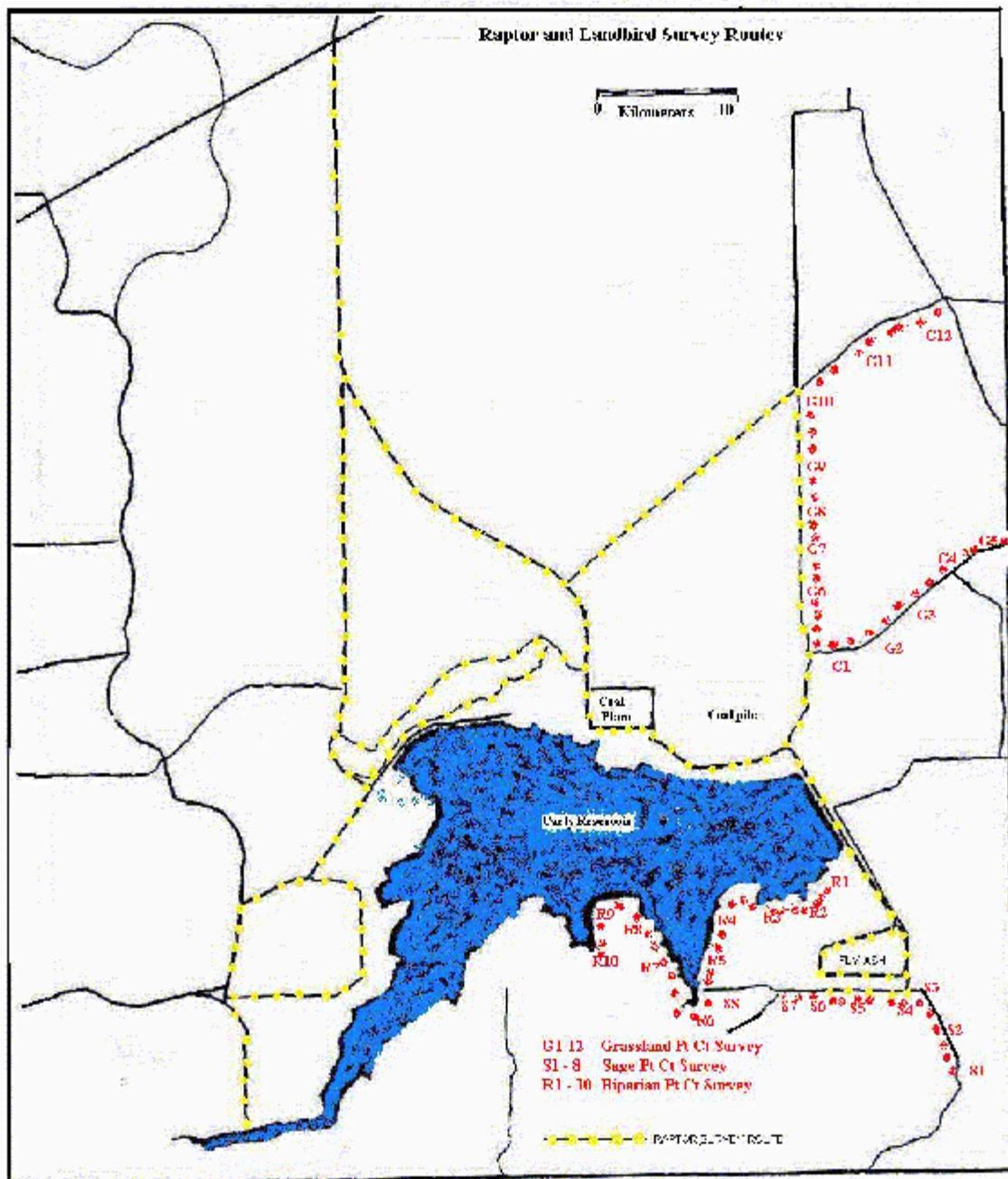
The grassland and sagebrush survey routes are located along primitive dirt roads; the riparian survey is an off-road point count that parallels a portion of the Carty Reservoir shoreline (Figure 1). All surveys commence at approximately sunrise and are completed no later than three hours after sunrise. Landbirds are counted at 12 established census points along the grassland route, 8 census points along the sagebrush route, and 10 census points along the riparian route. The distance between census points ranges from approximately 425 to 2,300 ft (130 to 700 m). Census points along the grassland and sagebrush survey routes are reached by motor vehicle, while the riparian census points are accessed by foot. Bird counts are made at each census point for exactly 5 min. The number of individuals is recorded separately for each species detected within 50 m of the surveyor, and for all species detected beyond 50 m. Data are also recorded separately for those individuals seen or heard during the first 3 minutes, and for those seen or heard during the remaining 2 minutes. 'Fly-overs', or birds simply flying through the area, are recorded separately as well. The observer, date, time, air temperature, and current weather are recorded for each route. Field data are transferred to an appropriate database management system for reporting and analysis.

### 2. Raptor Surveys

Raptor surveys are conducted once per month from March through August and in December and January. The surveys are conducted by vehicle on PGE property along the route outlined in Figure 1. Raptor nest sites on PGE controlled properties are noted and monitored throughout the season to determine nesting success and preferred habitat characteristics. Although the relative abundance and distribution of all species are monitored, emphasis is given to monitoring all nesting pairs of Swainson's and ferruginous hawks and any other raptor species of special concern.

The survey can commence and end at any point along the designated route and is usually conducted in the morning. However, since the object of each survey is to determine the identity and number of individuals in the area at a particular time, the survey can be conducted any time during the day when weather conditions are favorable. For each observation, the species, location, time of day, and habitat will be recorded. Field data will be transferred to an appropriate computer database for analysis and reporting.

Figure 1. Raptor and Breeding Bird Survey Routes



### 3. Waterfowl

Carty Reservoir frequently experiences heavy waterfowl usage, especially during the winter months. Although primarily used as a wintering area, some species use shoreline habitat for nesting. To monitor waterfowl usage of the reservoir, PGE conducts annual breeding pair counts for ducks, and brood counts for both ducks and geese. Winter waterfowl counts are made by governmental agencies as part of the Columbia Basin winter population estimate.

Breeding pair counts are conducted once in the spring (April or May). Brood count surveys are conducted in mid May for geese, and in late June or early July for ducks. Data are recorded separately by area to facilitate census efforts and document possible differential use of the reservoir. The surveys are conducted by vehicle (e.g., pickup truck) and on foot from the shoreline, or by boat on the reservoir. Field data are transferred to an appropriate computer database for analysis and reporting.

### 4. Mammals

Since the construction of Carty Reservoir, including the subsequent establishment of riparian habitat along the perimeter of the reservoir, and circle farming with irrigation run-off; the diversity of mammal species in the area has increased. Mammals associated with water bodies and wetlands are now commonplace, and a dramatic increase in the deer population has been noted.

Mammal species and the relative number of each species are observed in conjunction with the breeding bird, raptor, and waterfowl surveys, as well as during other visits to the site. The location, species, number of animals, and any noteworthy characteristics or behavior are recorded and ultimately transferred to an appropriate database for inclusion in the annual report.

As a participant in the US Fish and Wildlife Service approved Multi-species Candidate Conservation Agreement with Assurances (MSCCAA) for the Boardman area, PGE is committed to conducting biennial surveys for the Washington ground squirrel. The Agreement provides protection for the Washington ground squirrel, ferruginous hawk, loggerhead shrike, and sage sparrow. Though the Washington ground squirrel surveys are not a requirement of this Boardman Terrestrial Monitoring Program, the results of the surveys will be reported in the Program's annual report as supplemental information.

### 5. Vegetation ~~/Aerial surveillance~~

~~Both the cultivated and natural shrub-steppe vegetation are monitored using aerial imagery, both natural color and near infrared. Abnormal changes in cultivated and natural plant communities near the power plant as well as~~

~~observable abnormal changes in water levels and riparian vegetation are assessed. In addition, the extent of fugitive coal dust dispersion is monitored. Aerial imagery is obtained along thirteen (13) predetermined flight lines in the vicinity of the coal plant. Imagery is taken seven (7) times throughout the year on a monthly basis from March through September at a scale of about 1:36,000. Imagery is also taken one time per year in April or May at a scale of about 1:18,000. Images are reviewed on a monthly basis, and a summary report is compiled at the end of each year.~~

~~In addition to aerial surveillance,~~ Unusual perceptible changes in vegetation communities are documented in conjunction with the breeding bird, raptor, and waterfowl surveys, as well as during other visits to the site. Noxious weeds and their locations are noted and appropriate measures for removal or control recommended.

Any vegetation related surveys conducted outside the scope of this ecological monitoring program will be reported in the annual report. For example, under the MSCCAA, PGE is committed to vegetation community mapping every 8 years, or within two years after a significant wildfire event. The results of this mapping analysis will be included in the annual report.

## 6. Amphibians and Reptiles

The presence of amphibian and reptile species and their relative numbers are documented in conjunction with the breeding bird, raptor, and waterfowl surveys, as well as during other visits to the site. Every third year, amphibian breeding season surveys are conducted in and around Carty Reservoir to document the presence and relative abundance of breeding amphibians. Generally accepted protocols for amphibian surveys are employed.

## 7. Fish

To determine species and general condition of fish in Carty Reservoir, a survey is conducted every third year. By means of electro-shocking, gill netting, and hook and line; fish are collected, identified and examined for diseases, parasites or any other unusual characteristics. If deemed necessary, laboratory tests may be conducted to determine levels of any harmful trace metals or other chemical constituents.

## 8. Annual Report and Consultation

An annual report, "Terrestrial Monitoring Program for the Boardman Coal-fired Plant, ~~PGE 3005~~", will be submitted within 90 days from the end of the calendar year. Consultation with the Oregon Department of Fish and Wildlife will also be conducted yearly to review and assess the content of the monitoring program.