

Fall 2011 City of Portland
Ecoroof Bird Monitoring - Assessment



Background

Ecoroofs are becoming a more common alternative to conventional roofing practices because of the multiple benefits they provide. In addition to creating long-term cost savings by extending the life of the roofing membrane, they manage stormwater, cool and clean the air, save energy and provide habitat. Portland's Ecoroof Program is taking a closer look at the habitat benefits of ecoroofs for macroinvertebrates and birds. This study is the first in the City to compare ecoroofs with conventional roofs and ground-level greenspaces to find patterns of presence and use by birds. Additional sampling is planned for spring and fall 2012.

Ecoroofs are altered habitats; generally thin-soiled, open and exposed, with ground-hugging vegetation, and prone to summer drought and periods of brief winter saturation. In the region, they are most similar to rocky outcrops on ridges, where sedums, mosses and grasses are predominant. Urban ecoroofs tend to be isolated from other habitat, like islands surrounded by pervious surfaces and raised up, limiting access to many terrestrial species.

Protocol

- 9 sites were monitored, all among highly urbanized surroundings near or in downtown Portland, Oregon: 3 ecoroofs (groundcover vegetation), 3 control roofs (conventional roofing) and 3 ground-level greenspaces (mostly open with some shrubs and trees).
- All roofs are flat and on commercial buildings.
- Monitoring occurred from 8-10am on seven mornings between 9-7-11 and 10-21-11
- 6 sites were sampled twice, 3 sites were sampled three times.
- For each sampling, bird monitoring occurred simultaneously at one ecoroof, one nearby control roof, and one nearby ground-level greenspace.
- Birds heard and seen on or directly above the sites were counted, as well as fly-overs that were low enough to appear related to the site.

- 14 volunteers and 3 City staff contributed to bird count shifts



Site Descriptions

Central Eastside Industrial Area Sites

An area of approximately 30,000 square feet was monitored for each of the following sites:

- ***Central Wine Warehouse ecoroof:***
Ecoroof Constructed: 2008
Number of Stories: 2
Distance from Willamette River: 3 blocks
Design: Mix of sedum, grasses and forbs in extensive greenroof soil blend with red cinder drainage channels. Soil depth averages about 5”.
- ***Tazo control roof:***
Number of Stories: 2
Distance from Willamette River: 2 blocks, with the interstate and railroad running between.
Roofing Type: Asphalt membrane with a light-colored granular coating.
- ***Tazo parking lot:***
Distance from Willamette River: 2 blocks, with the interstate and railroad running between.
Vegetation: Site is paved with small landscape strips with medium-size trees providing about 40% canopy.

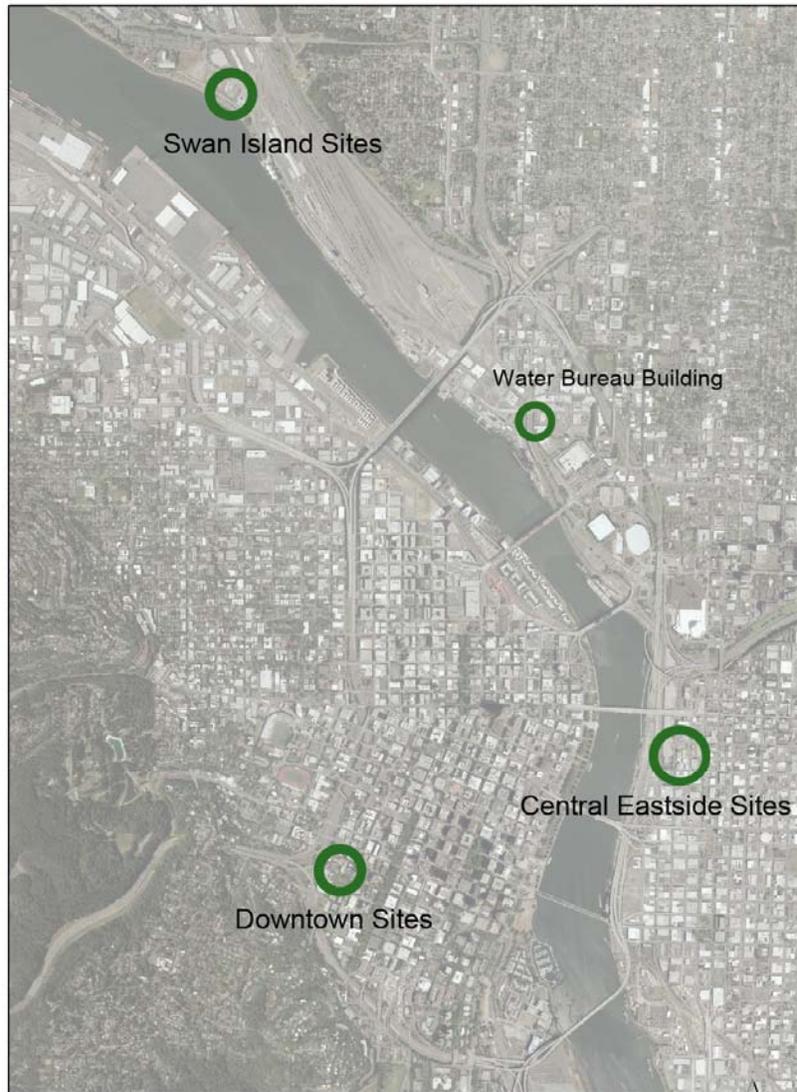
Downtown Sites

An area of approximately 5000 square feet was monitored for each of the following:

- ***Hamilton West Apartments ecoroof:***
Ecoroof Constructed: 1999
Number of Stories: 10
Distance from Willamette River: 14 blocks

Design: Dominated by sedum and volunteer grasses, with some forbs. Includes a geotextile drainage membrane beneath two different soil blends between 3 and 5” deep.

- **12th Avenue Terrace Apartments control roof:**
Number of Stories: 6
Distance from Willamette River: 14 blocks
Roofing Type: Covered in pea gravel.
- **PSU park block:**
Distance from Willamette River: 13 blocks
Vegetation: Lawn with mature street trees around two sides.



Bird Sampling Sites

Swan Island Sites

An area of approximately 7000 square feet was monitored for each of the following sites:

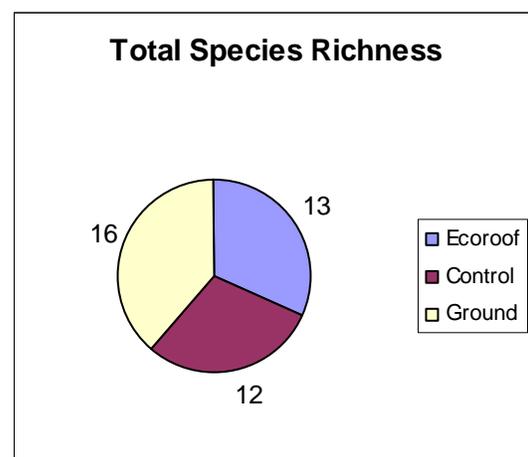
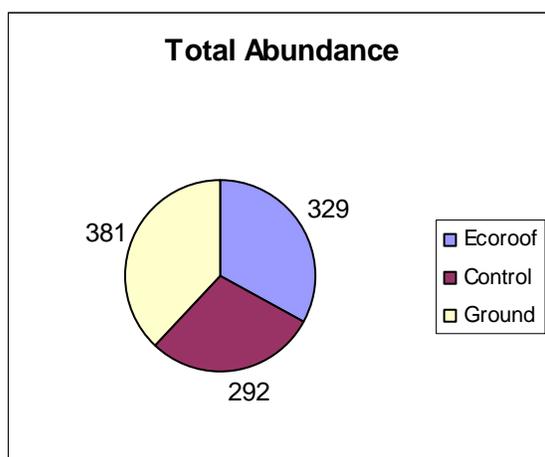
- **Swan Island pump station ecoroof:**
Ecoroof Constructed: 2006
Number of Stories: 2
Distance from Willamette River: 250 feet
Design: Planted with various sedum species in approximately 4” extensive soil mix with a geotextile drainage membrane.

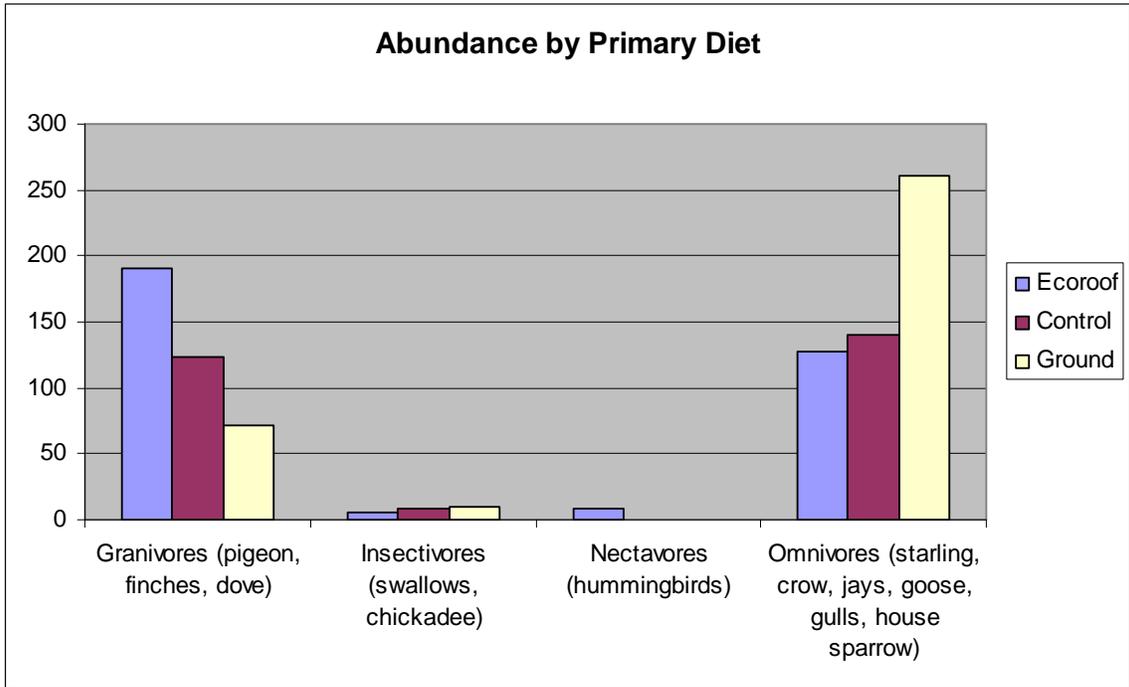
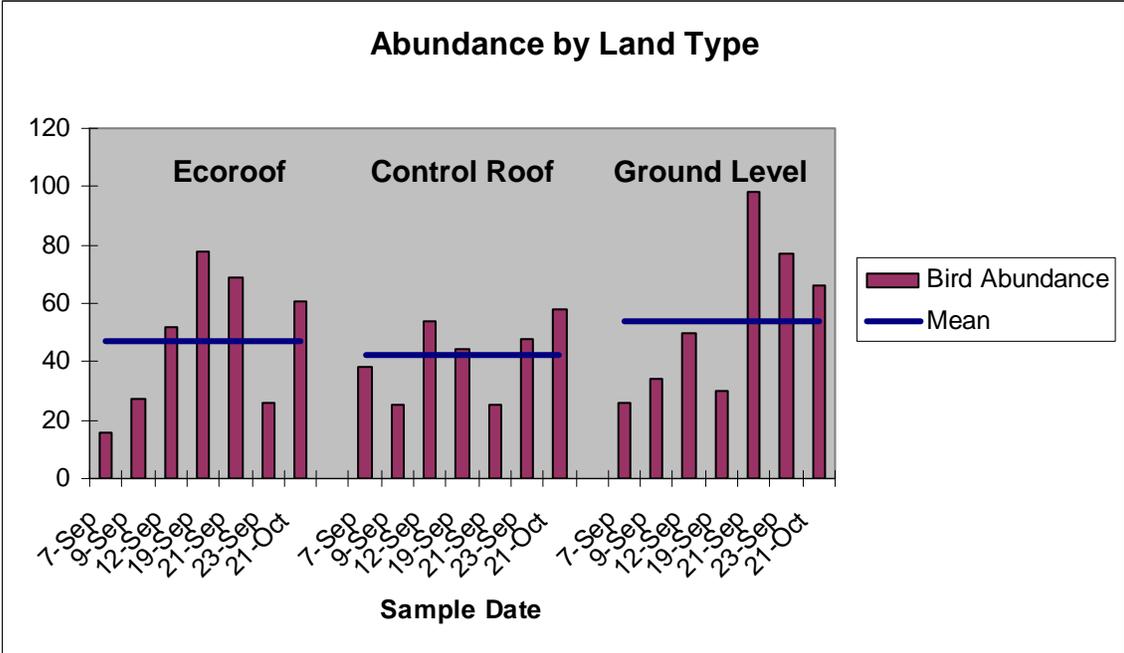
- **Water Bureau building control roof:**
Number of Stories: 3
Distance from Willamette River: 3 blocks. Due to a lack of an adjacent accessible conventional roof, this roof about 1.5 miles upriver was selected.
Roofing Type: It has a black tar membrane covered with concrete pavers and some moss.
- **Greenway Trail:**
Distance from Willamette River: Adjacent
Vegetation: Site includes a sandy beach, native landscaping and a few medium size trees.

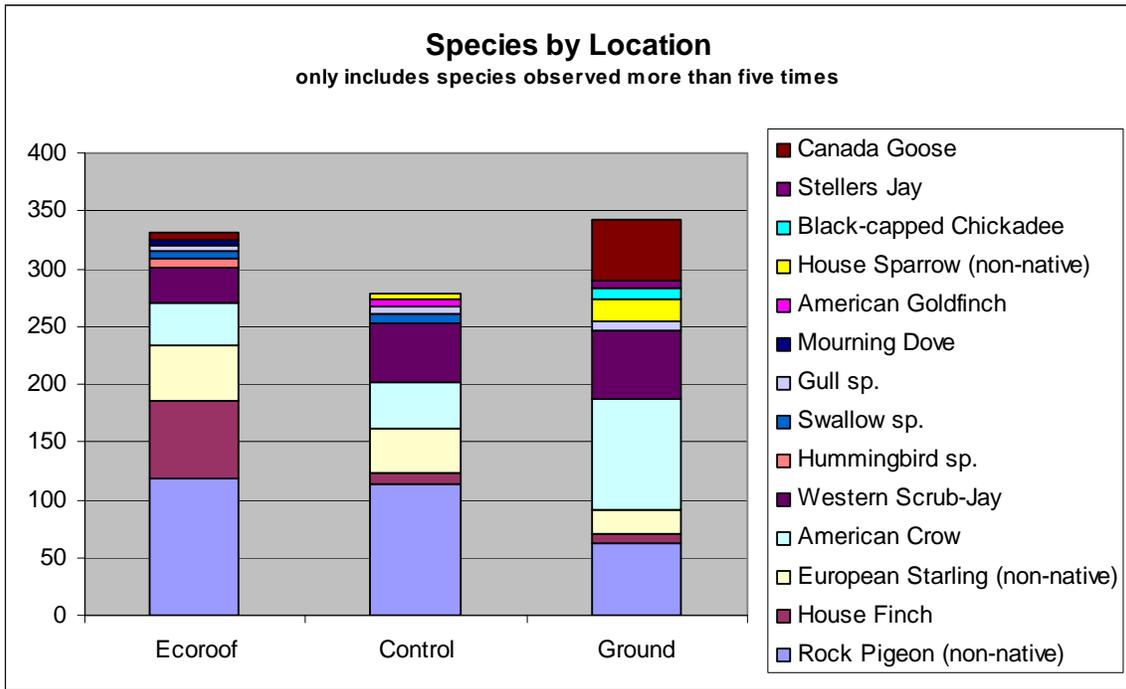
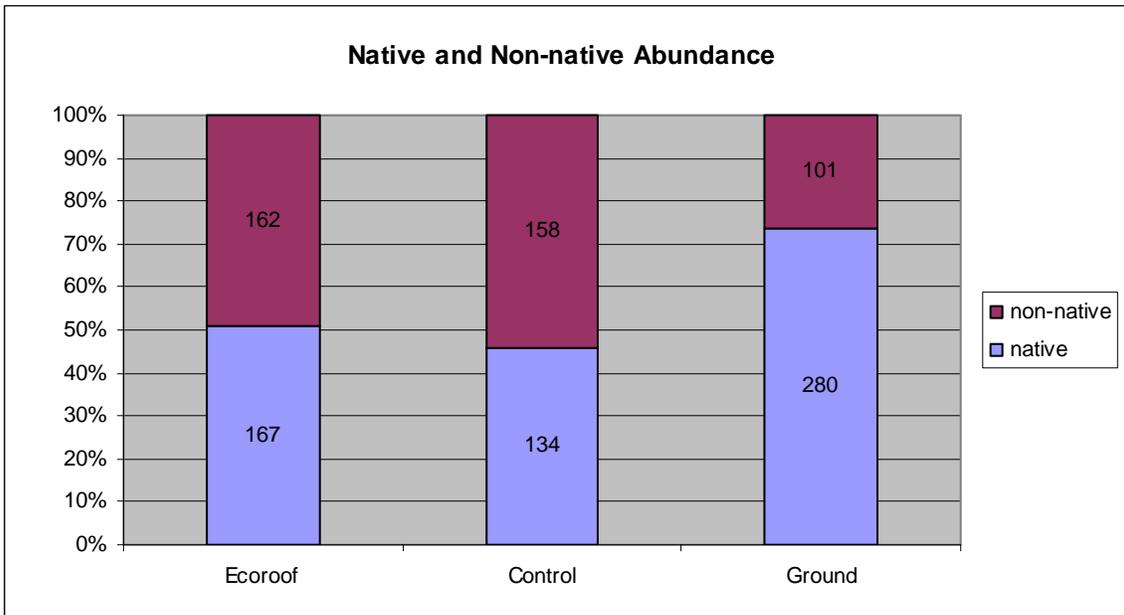
Results

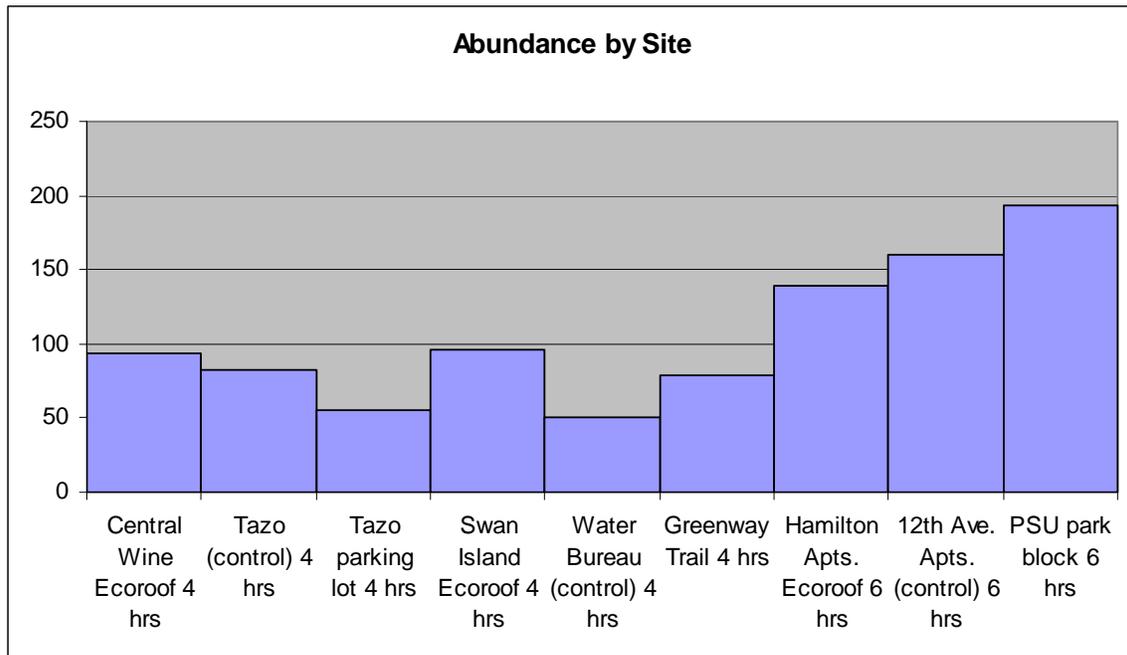
This effort is considered a trial and at this level the results are not statistically significant. The intent is to work any kinks out of the protocol, and these results will provide a building block for future survey results.

- These first results show ecoroofs contain slightly more species and individuals (“abundance”) than conventional roofs, and slightly less species and individuals than ground-level green spaces.
- When looking at abundance by dietary preferences, seed and pollen eating birds were most abundant on ecoroofs, while omnivore “generalists” were more prominent on the ground. Species with diets consisting of mostly insects were found approximately in even numbers on all land types. Nectarivores (hummingbirds) were only found on ecoroofs in this study. These dietary classifications are only averages, as most species eat some combination of plant and animal matter, with ratios sometimes changing with the season.
- The most abundant bird in general, on ecoroofs and on conventional roofs was the non-native rock pigeon. This species is however the primary food item for urban raptors including Red-tailed and Cooper’s Hawks, as well as Peregrine Falcons.
- One Portland Special Status Species was observed: a Yellow Warbler, in the Tazo parking lot shrubbery. Special Status Species are associated with important habitat attributes or conditions that support functioning ecosystems. Few migratory birds were observed, and most of those were gulls and swallows.
- The charts below that are related to species only include high-confidence identifications. Low-confidence or unidentified birds are only included in data relative to individual numbers. Data regarding particular species presence/absence is of lowest confidence as different volunteers had different skill levels at identification and different styles of recording.









Lessons Learned

- To make this study work, birders need to be of equal competence and highly motivated to follow-through with all outings.
- If using birders of different skill levels, studies should focus on total abundance instead of particular species.
- There may have been a difference in how spotters recorded birds suspected of being the same individual seen repeatedly. Similarly, other judgment calls such as whether a species was attracted to the space or passing over indifferently are grey areas. Future training will be important to keep recording consistent.
- Gulls, hummingbirds, and small, fast, drab birds making fleeting appearances can be difficult to impossible to identify to species level for both novice and advanced birders. There will inevitably be some birds that will go unidentified.
- Season plays a role on monitoring results. Gulls were just starting to arrive in the final samplings, while swallows were just heading out during the first samplings. Similarly flocks of Dark-eyed Juncos have been seen on ecoroofs in winter time, when most arrive in the Portland area.
- The more sampling days the better. A large flock (60+) of Canada Geese arrived on the river flying low over the ground site on 9-21. With such a small number of sampling days, events like this make the broader statistical patterns difficult to read.

Birds of Portland Ecoroofs



House Finch



Violet-Green Swallow



Mourning Dove



American Crow



American Goldfinch



Western Scrub-Jay



Anna's Hummingbird



Glaucous-winged Gull



Barn Swallow