



IMPACT OF HABITAT RESTORATION ON BIRD POPULATIONS AT POWELL BUTTE NATURE PARK

DR. TOM VIRZI, RESEARCH ECOLOGIST
EXECUTIVE DIRECTOR

US Grasslands

- ~ 50% Decline
- Grassland Ecology
 - Climate
 - Hydrology
 - Fire Regime
 - Grazing



Figure: National Audubon Society

Willamette Valley Prairie Habitat

- < 1% Remains
- Major Threats
 - Climate Change
 - Conversion for Agriculture/Development
 - Fragmentation
 - Invasive Species

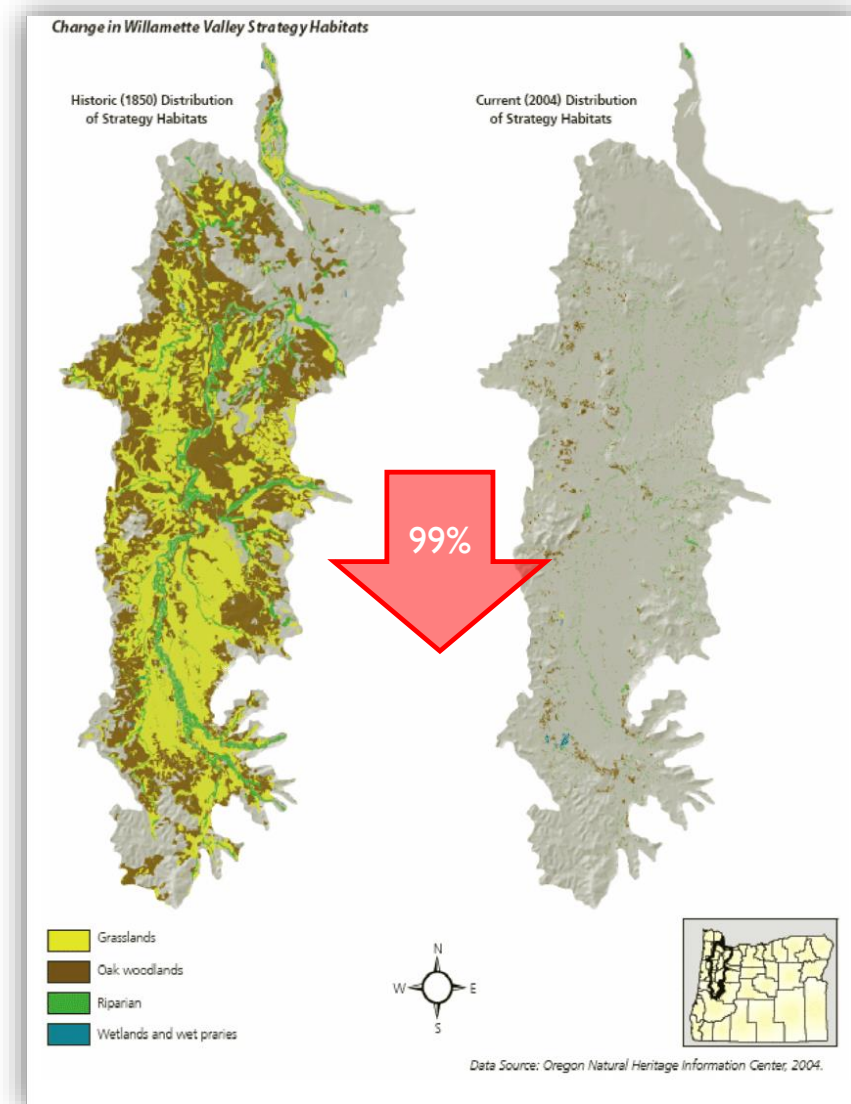


Figure: Oregon Natural Heritage Information Center

US Grassland Bird Declines

- > 40% Decline in US Grassland Birds Past 50 Years
- Willamette Valley Birds
 - Grassland Obligates
 - Vesper Sparrow
 - Western Meadowlark
 - Streaked-horned Lark
 - Savannah Sparrow

98%




Image: Cornell Lab of Ornithology

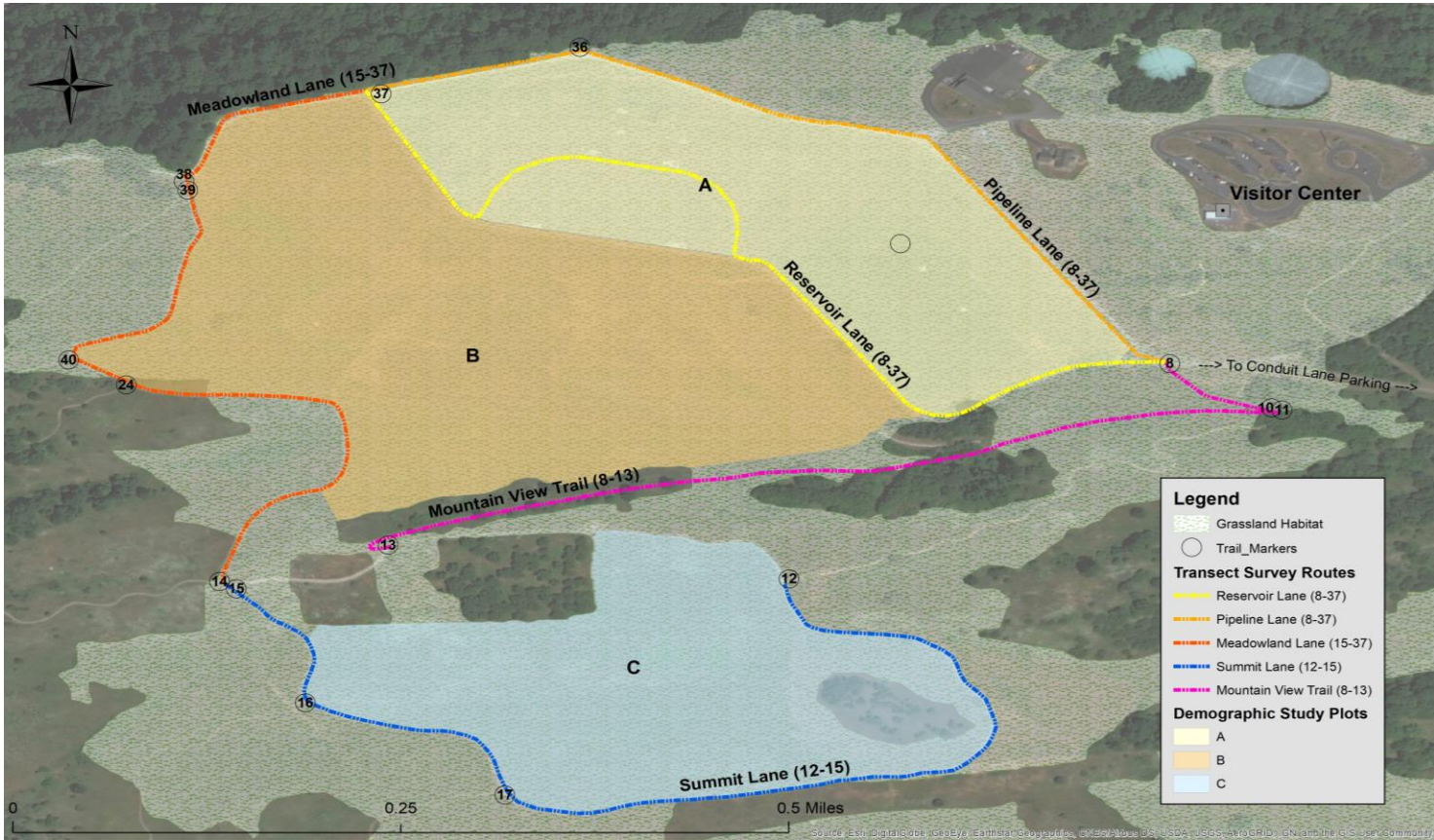


Image: blog.nationalgeographic.org



Impact of Habitat Restoration on Bird Populations at Powell Butte Nature Park

- Demographic Study
 - Research goals:
 - Assess grassland habitat quality at PBNP by studying indicator species breeding at the site.
 - Focal species = Savannah Sparrow (SAVS) + other grassland birds.
 - Determine status and distribution of SAVS and other grassland birds at PBNP.
 - Study breeding populations and compare demographic rates (e.g., nest success, survivorship, etc.) over time as restoration advances at the site.
 - Citizen Science Surveys
 - Research goals:
 - Assess the impact of habitat restoration on bird populations at PBNP.
 - Collect data on entire bird community at PBNP (not just focal grassland species).
 - Collect additional data on focal species.
 - **Community participation in scientific research.**
- 



• Study Design

- Season: April-June
- Survey Area: Coincides with Demographic Study Plots
- 5 Survey Routes (Transects)
- 24 Volunteers – 92 Surveys
- Count All Birds (eBird)

Powell Butte Nature Park Grassland Bird Surveys

Powell Butte Nature Park Grassland Bird Surveys

RESULTS

Species	Total Count	% Surveys	Avg/Survey	Max Count
→ Savannah Sparrow	841	95%	9.1	30
American Robin	519	95%	5.6	20
Song Sparrow	217	76%	2.4	9
Dark-eyed Junco	196	65%	2.1	10
Spotted Towhee	186	71%	2.0	10
Barn Swallow	170	43%	1.9	16
Common Yellowthroat	165	61%	1.8	11
Lazuli Bunting	162	50%	1.8	14
Lesser Goldfinch	162	35%	1.8	16
Northern Flicker	144	73%	1.6	7

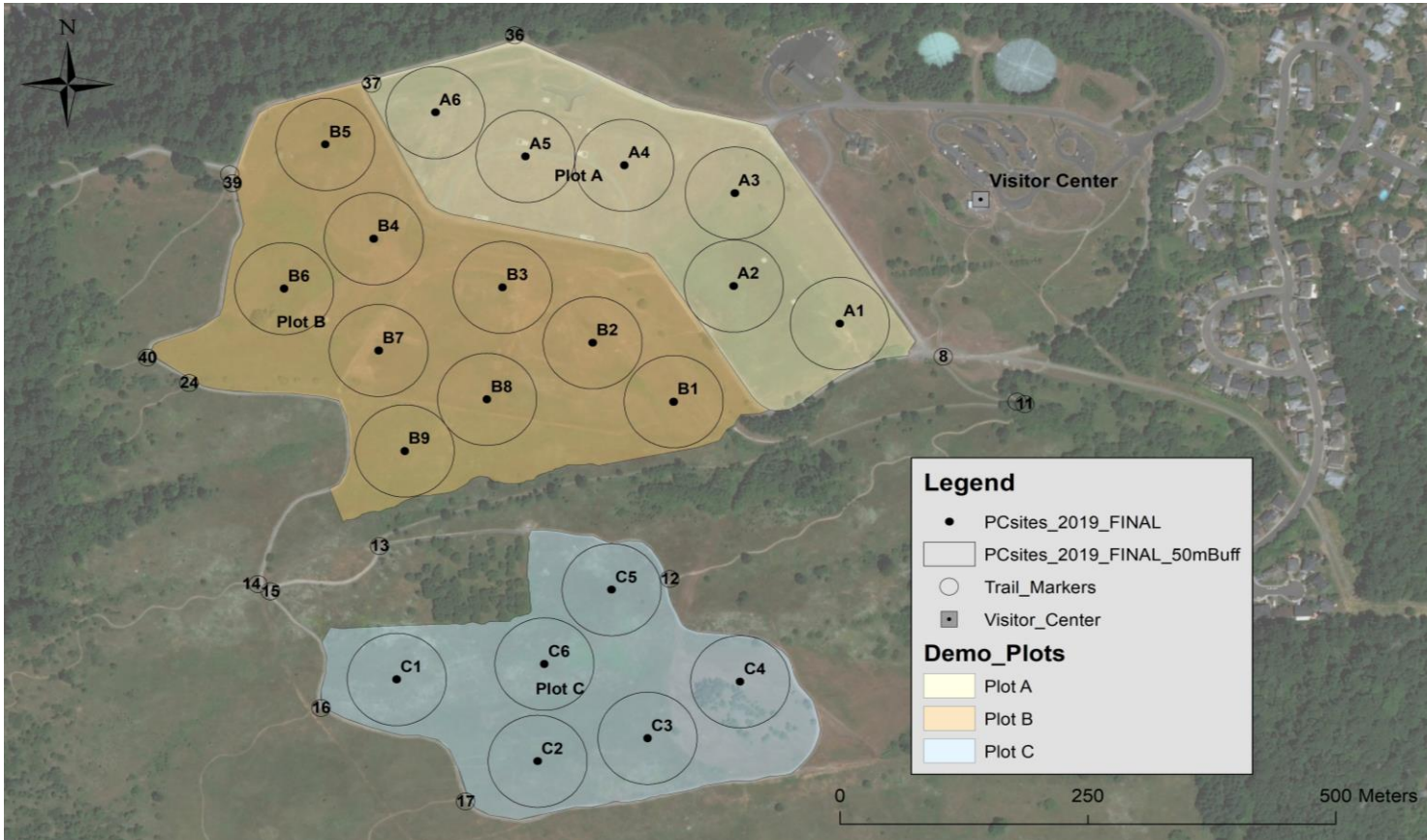


- 77 Species
- 4,221 Birds
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- Focal Species
- N = 92 SAVS



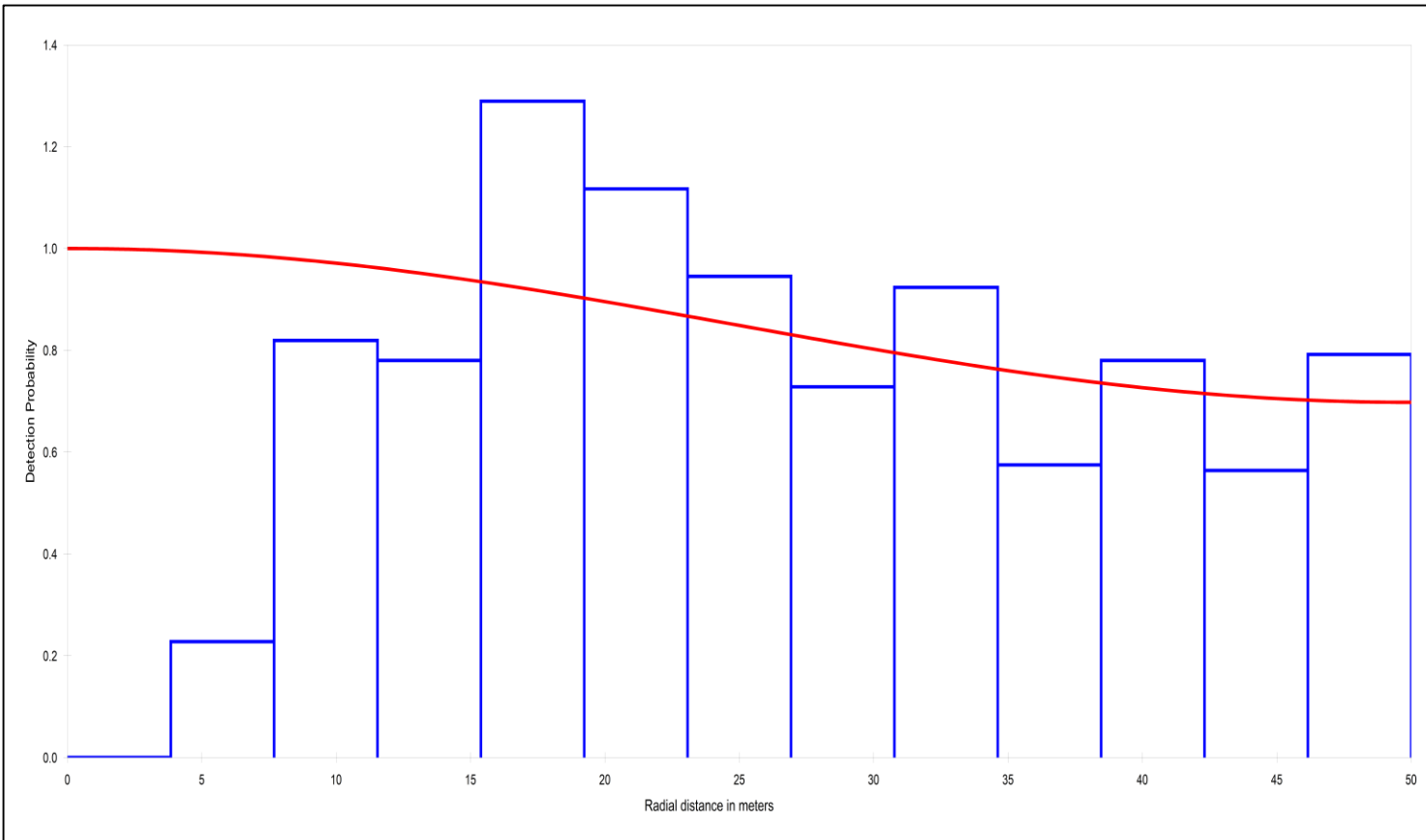
Demographic Study: Savannah Sparrows

- Methods
 - Point Count Surveys
 - Territory Mapping
 - Nest Monitoring
 - Mark-Recapture



- Point Count Surveys
 - 3 Study Plots (83 acres)
 - 21 Survey Sites
 - Repeated Surveys
 - Detection Probability (Distance Sampling)

Demographic Study: Savannah Sparrows



Demographic Study: Savannah Sparrows

- Point Count Surveys

- Detection Probability

- $p = 66.2\%$ (95%CI=59.2-1.00)

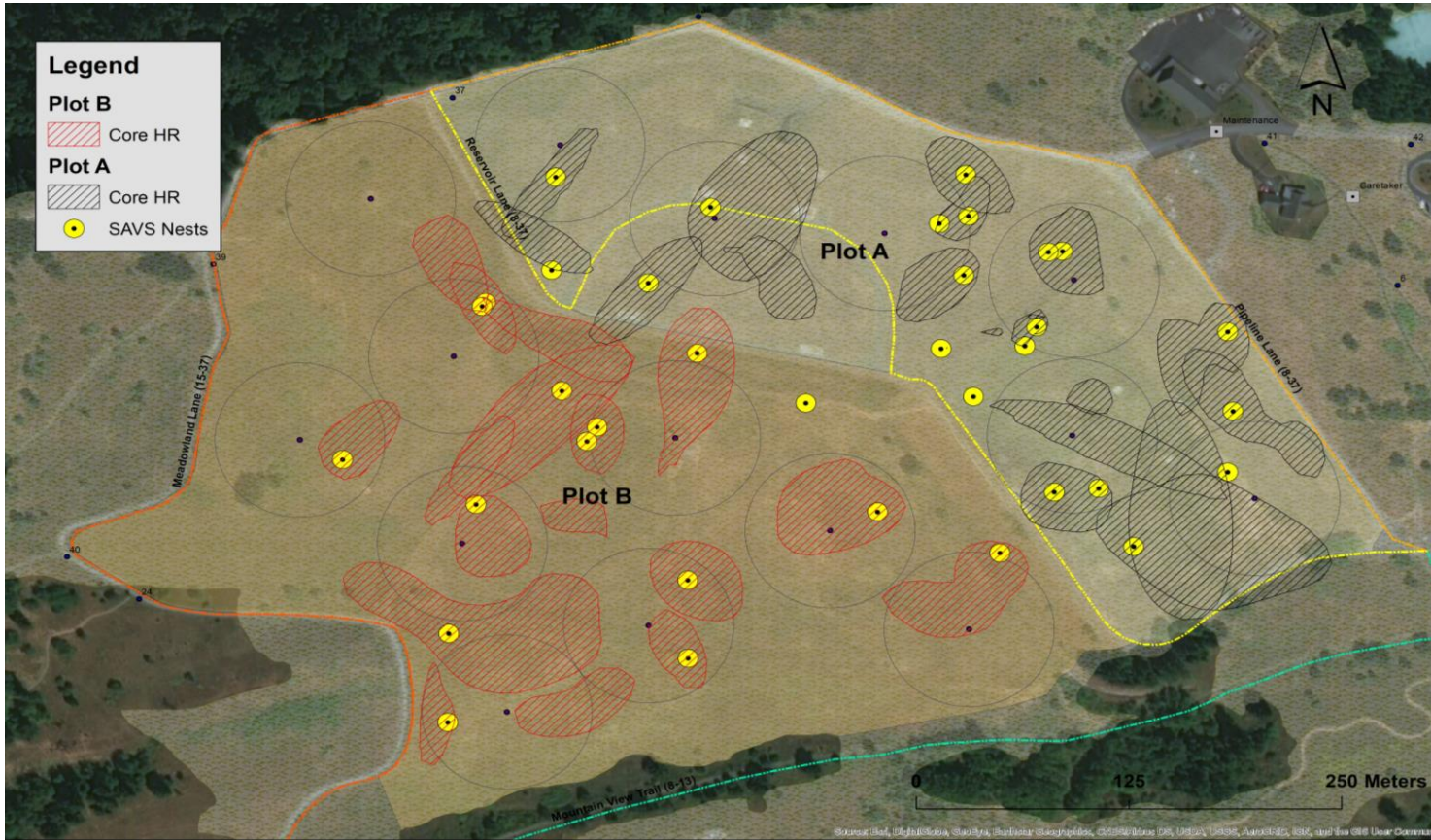
- Factors affecting p

- Woody vegetation

- Rolling terrain

- Observer bias

- Abundance (N) = 132 SAVS
(95% CI = 93-188)



Demographic Study: Savannah Sparrows

- Territory Mapping
 - Plots A and B (only)
 - 74 SAVS Total
 - 37 Male Territories (19 in A; 18 in B)
 - 29 Breeding Pairs (confirmed)
 - Plot C - Similar Density (no monitoring)



Demographic Study: Savannah Sparrows

- Nest Monitoring
 - Hatch Rate = 0.91
 - Nest Success = 0.52
 - Chicks Fledged Per Successful Nest = 3.6
- Total Productivity
 - 25 of 37 Pairs (68%) Fledged Young
 - 72 Fledglings!



Demographic Study: Savannah Sparrows

- Mark-Recapture
 - Color-banding to identify individuals
 - Data used to estimate survivorship, etc.
 - SAVS Banded 2019
 - 17 Adults (12 M : 5 F)
 - 8 Juveniles
 - SAVS Resighting 2020!

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