East Buttes Wildlife Connectivity and Conflict, Gresham OR

Portland State UNIVERSITY

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Metro

Introduction

Facilitating animal movement among habitats enables wildlife to access resources they need for survival. Such regional habitat connectivity becomes ever more crucial with continued urbanization and climate change. We created a process aimed at assisting planners in identifying barriers to mitigate and otherwise supporting wildlife movement in and around urbanized areas. We combined mapping methods to pinpoint barriers such as development and roads near or in habitat connectivity zones (HCZs) projected by species-based models. We identified locations where human-wildlife conflict occurs due to landscape scale impedances.

Methods

Species Model

- Northern Red-legged frog (*Rana aurora)*
- Surrogate species
- Urban and wetland habitat
- Common, but threatened by roads and development

Weighted Barriers

Tool: Spatial Analyst Weighted overlay, Con, Reclassify

Use: Evaluate landscape-scale development barriers low-high, define barrier

Data: Zoning, Land cover, Roads

Connectivity

Tool: Circuitscape Extension

Use: Model non-Euclidean movement

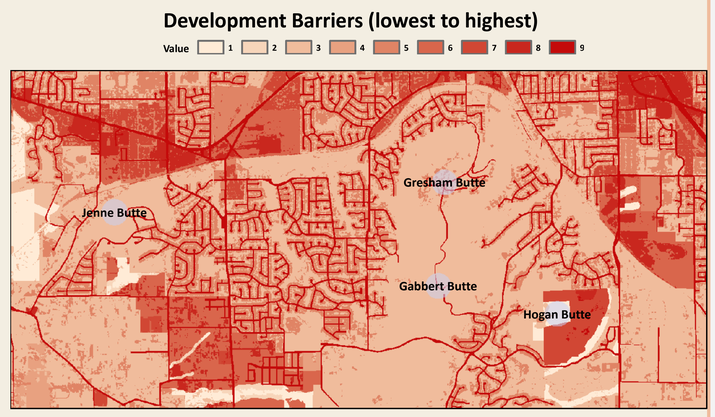
Data: Reclassed landcover to species model impedance layer Nodes for connecting 4 buttes in region, create HCZs

Weighting Landscape Barriers

Zoning Classes	Scale Value	Landcover Classes
Industrial, commercial, future urban development	8-9	Developed
Multi family residential, mixed use residential	6-7	---
Rural, single family residential, residential	3-5	Agriculture, sandbars
Parks and open space	1-2	Tree cover, low vegetation, water

- Wildlife professionals inform weighted overlay using a 1-9 scale.
- No Data values removed by reclassifying to lowest value (1).
- ALL roads in final weighted overlay (9).
- Two models of 'Development Barriers' created and compared (see additional document)

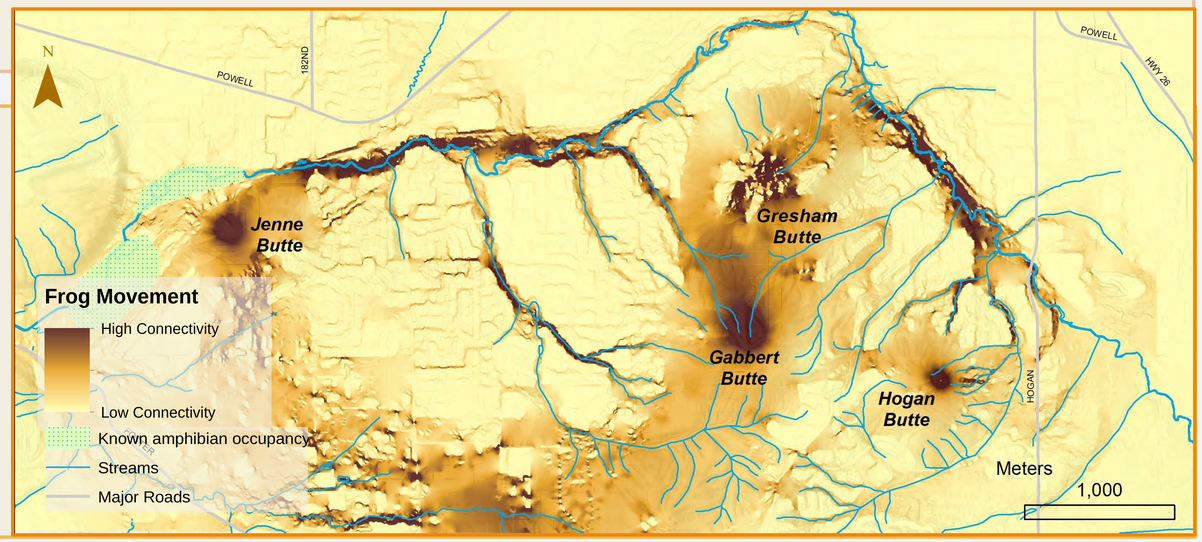
Figure 1 Weighted 75% zoning and 25% landcover overlay Model on right was selected to inform conservation planners of features with impedances affecting wildlife connectivity Thresholds were determined for lowest-highest threats to frog's movement based on feasibility of barrier mitigation. The highest values (7-9) were reclassified as barriers to the frogs.



Modeling Connectivity

- Realistic movement based on impedance values
- Wildlife movement paths between buttes.
- Potential for connectivity in the landscape especially near water sources and agricultural

Figure 2 We often known where amphibian occupancy occurs, but we do not necessarily know the movement paths taken by species like red-legged frogs. This map shows possible movement corridors for this species based on the extent of its habitat and locations of relatively permeable land use type.

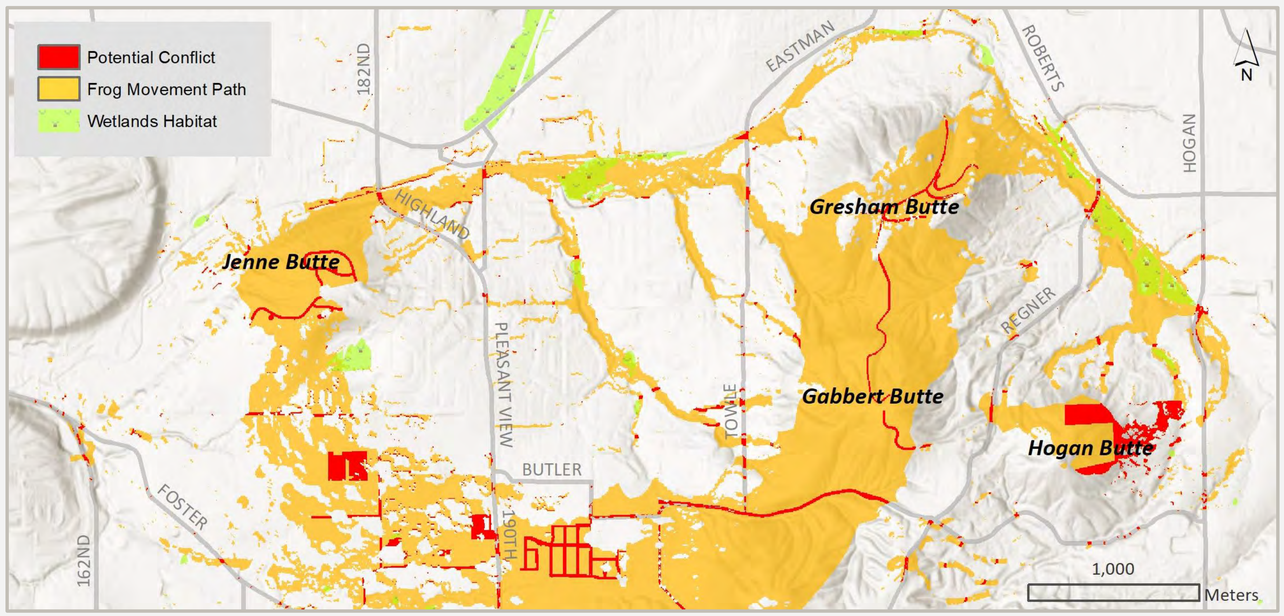


Preliminary Results

Feature	Conflict	Notes
Study Area	1.4% of study area (405,066 m^2)	study area extent is 28.35 km^2
Roads (taxlots STR)	1- SW Butler road (4%) 2-SW Towle Avenue (1%) All others (<1%) % of road conflict in study area	Primarily SW quadrant, E Hogan, N Jenne roads
Buttes (20m^2 polygon)	Jenne-E, SE,S Gresham- E, S Gabbert- N,S Hogan- N,NE,E, SE, S <100 m of butte center	Elevation gradient not integrated into assessment
Land cover (class)	barriers within all classes zoning *FUD, *IND,* COM, SFR, MFR, MUR	Potential corridors along wetland sites and known frog occupancy sites

Assessing Conflict

Potential human-wildlife conflicts occur when using defined threshold values for connectivity and barriers within the study area. Wider spread connective paths indicate best locations for HCZs. The North East-South West path (Gresham-Gabbert-Jenne buttes) is widest but intersects agricultural lands and industry. Johnson Creek contains wetland habitat and connective paths for frogs but is flanked by industry. Hogan butte is surrounded by FUD, unsuitable for frog connectivity. The selection of connective paths depends on the feasibility of mitigating barriers developed by these preliminary models and maps.



Next Steps

- Distance bins and buffers TBD rescaling of roads/zoning
- Ground survey of conflict locations will determine if fine-scale barriers are present on the landscape (fences, culvert, traffic volume, pollutants)
- Radio-telemetry to track frogs and fine tune/validate further models for species-specific barrier mitigation in order to delineate HCZs for conservation plan
- Management for barrier mitigation will require multi agency and stakeholder collaboration for best conservation strategies

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Maps produced with ArcMap Desktop and Circuitscape