The Biggest Lab on Campus

Lessons learned from designing a hands-on course in Restoration Ecology

Dr. Julia Michaels, Reed College

Reed Magazine

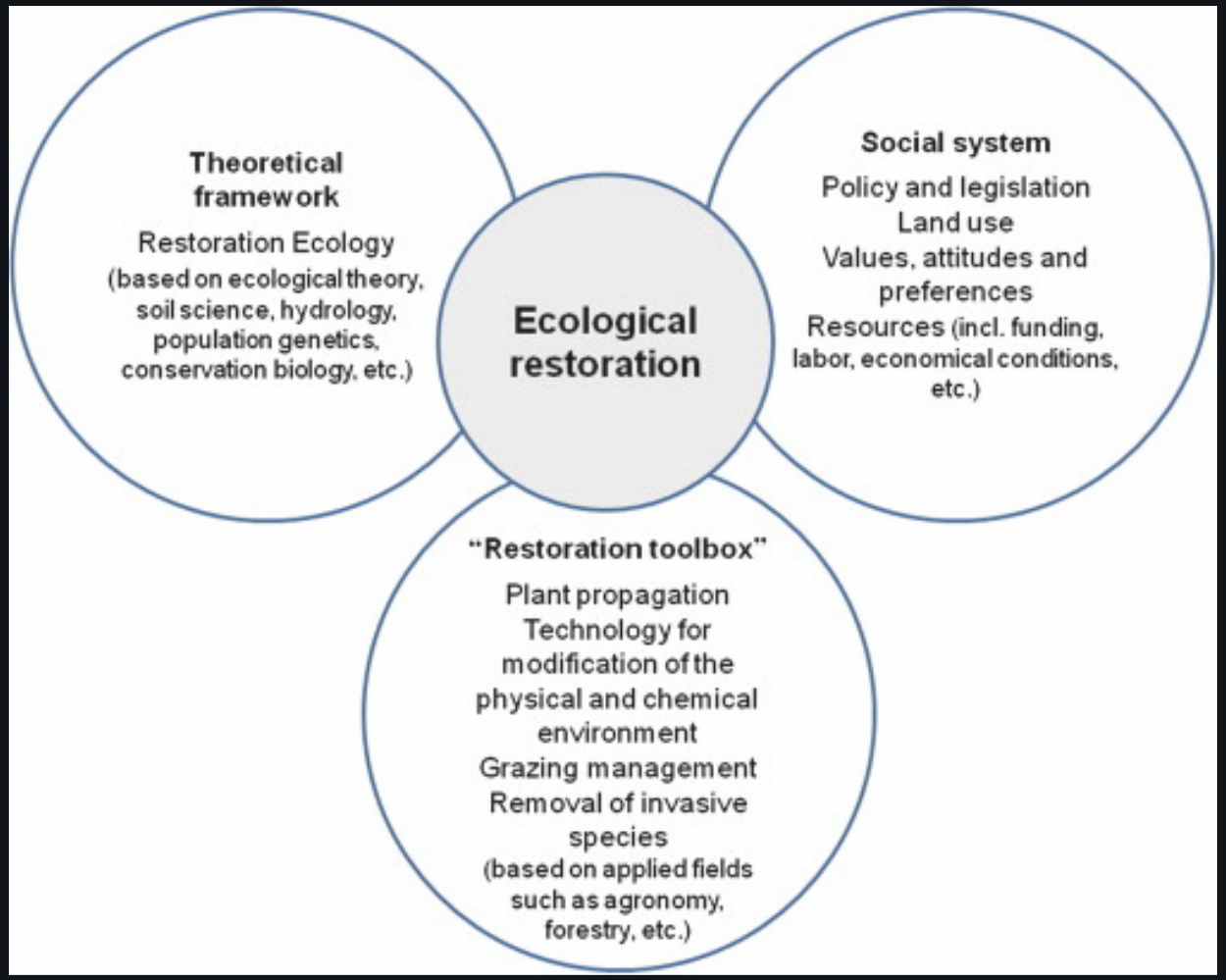
Aislin Steill '21 checks the batteries and replaces the storage disk in a wildlife camera. PHOTOS BY TOM HUMPHREY

SCIENCES

The Biggest Lab on Campus

Bio students make exciting discoveries in the Reed canyon—and raise questions for its future.

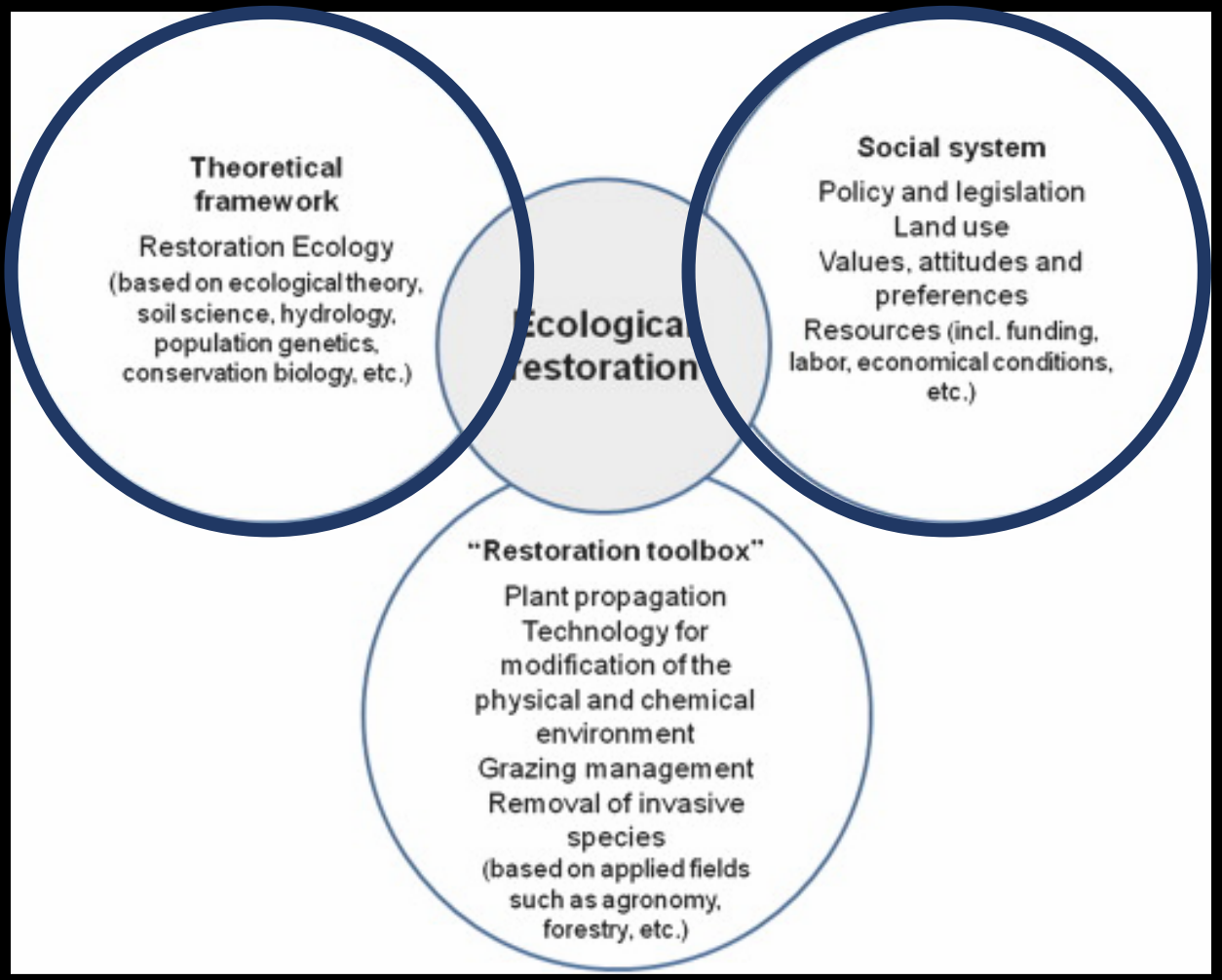
By Katie Pelletier '03 | May 3, 2021


Theoretical framework
Restoration Ecology
(based on ecological theory, soil science, hydrology, population genetics, conservation biology, etc.)
Ecological restoration
Social system
Policy and legislation
Land use
Values, attitudes and preferences
Resources (incl. funding, labor, economical conditions, etc.)
"Restoration toolbox"
Plant propagation
Technology for modification of the physical and chemical environment
Grazing management
Removal of invasive species
(based on applied fields such as agronomy, forestry, etc.)

Course Goals

- Understand how foundational ecological theory can both inform and be informed by restoration
- Field-based data collection, analysis, and hypothesis testing
- Balancing ecological, economic, and social trade-offs in goal setting
- Science communication

Lecture: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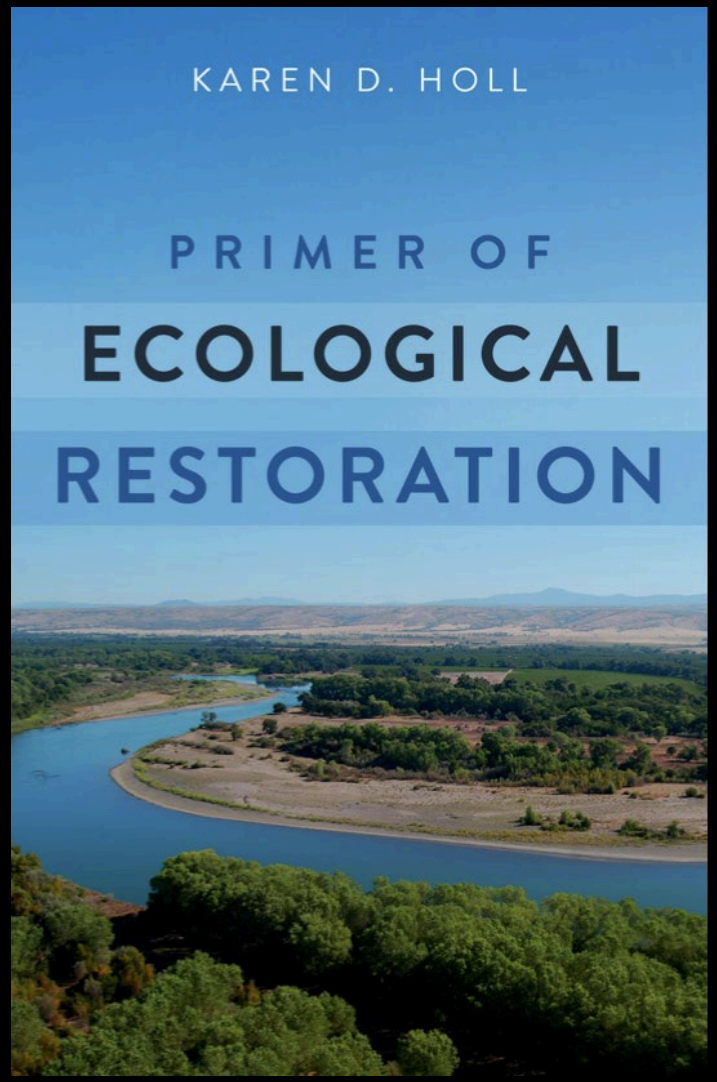
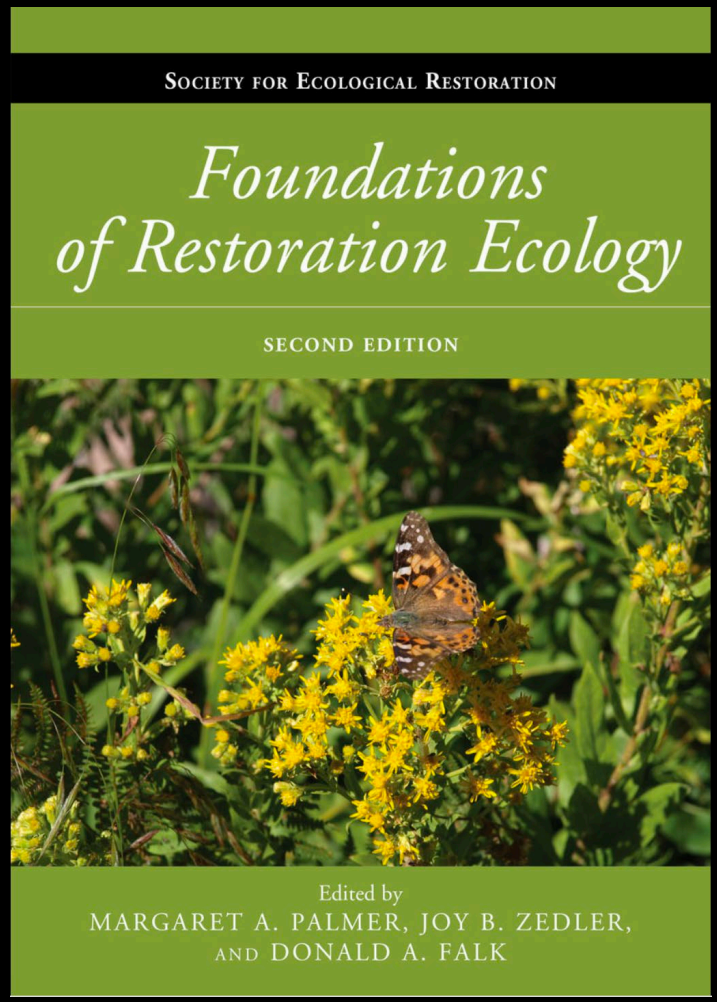
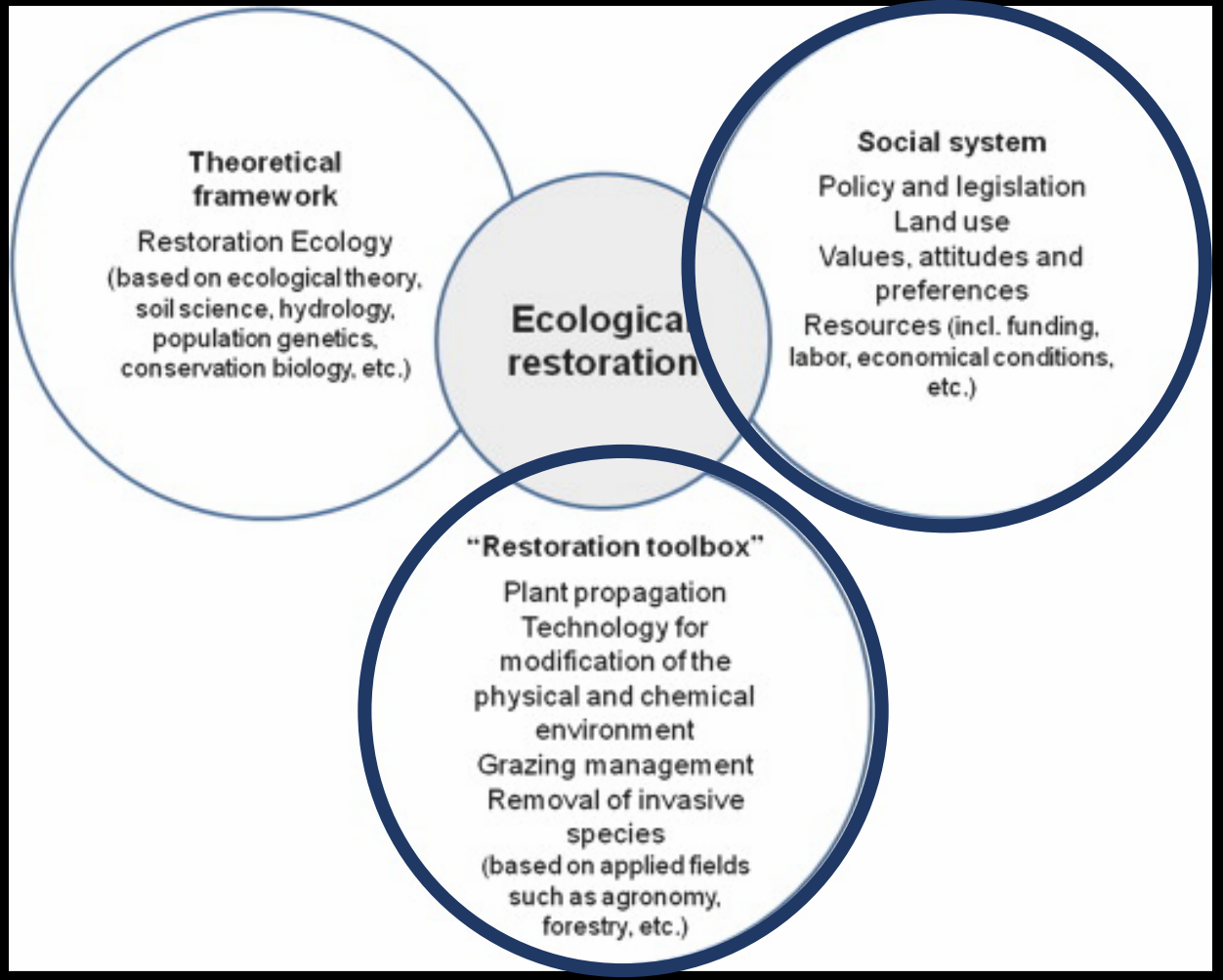

KAREN D. HOLL
PRIMER OF
ECOLOGICAL
RESTORATION


SOCIETY FOR ECOLOGICAL RESTORATION
Foundations of Restoration Ecology
SECOND EDITION
Edited by
MARGARET A. PALMER, JOY B. ZEDLER,
AND DONALD A. FALK

Lab: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Unit I: Site History

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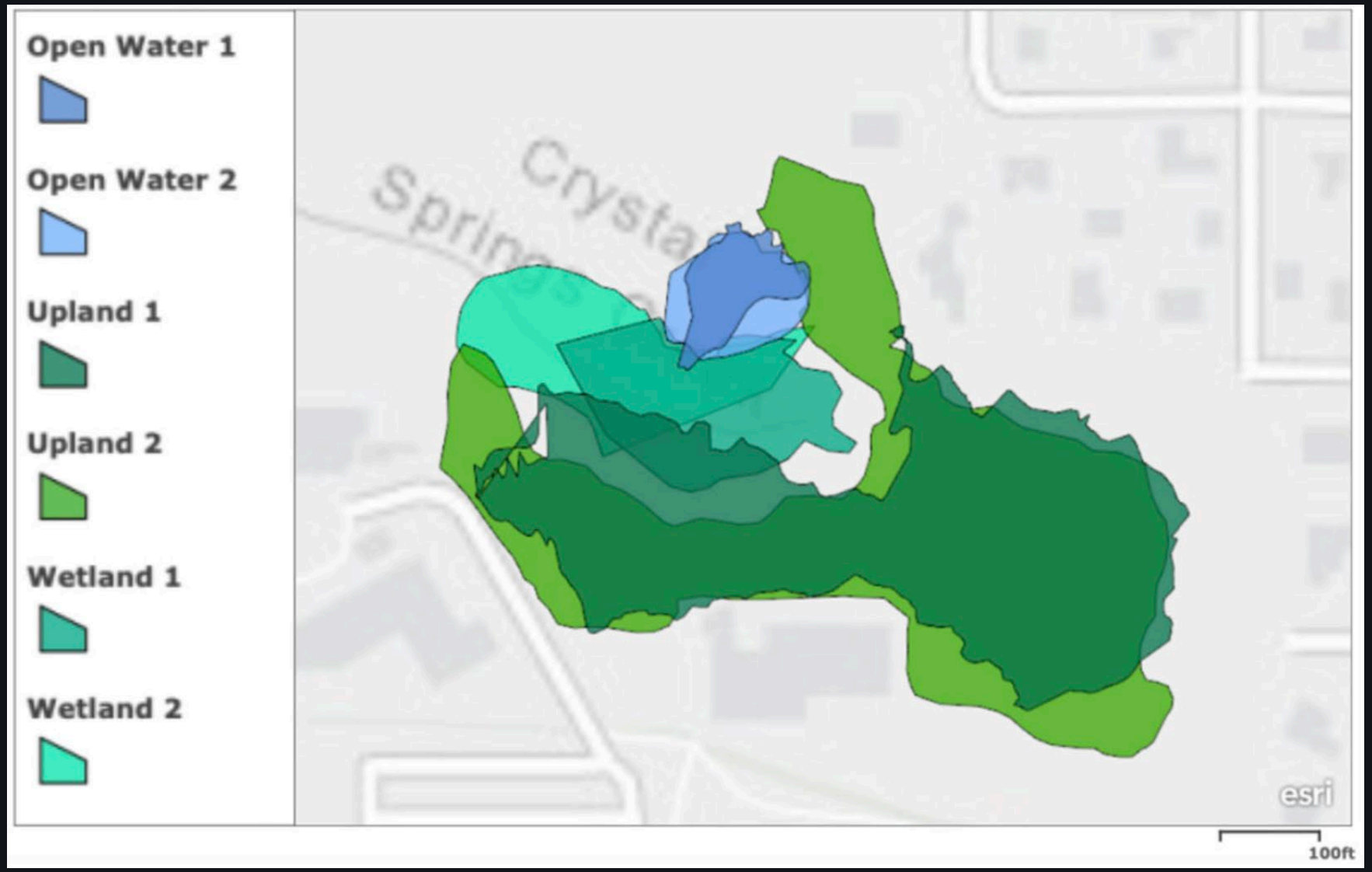
Unit I: Site History

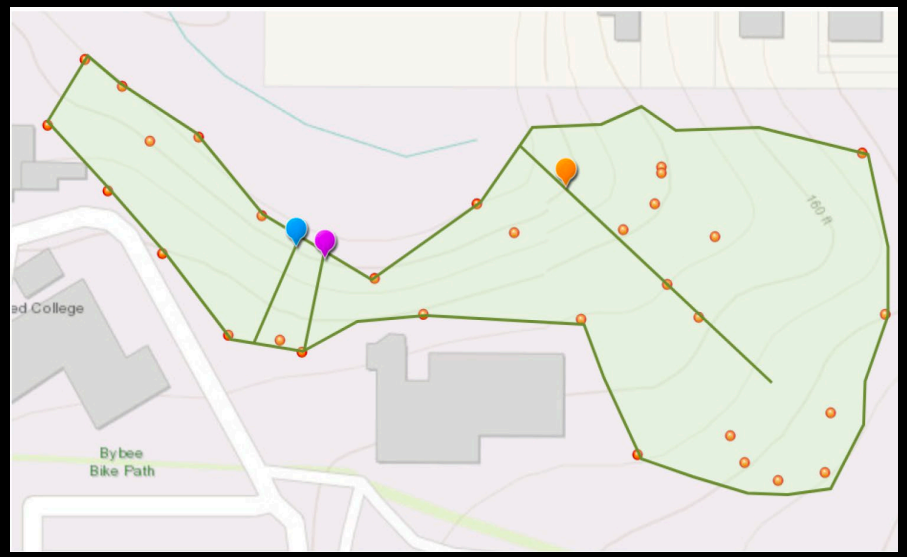
HOME BIOLOGY 308 ENGLISH IVY FISH LADDER FUNGI MISSOULA FLOODS RESTORATION APPROACHES CROSS-CANYON PIPELINE DEAD TREES

RED CEDAR BIOSWALES SNOWBERRY FISHY BUSINESS FORAGING FUN! THESE AREN'T JUST WEEDS! GREAT BLUE HERON THANKS TO THE BEAVERS

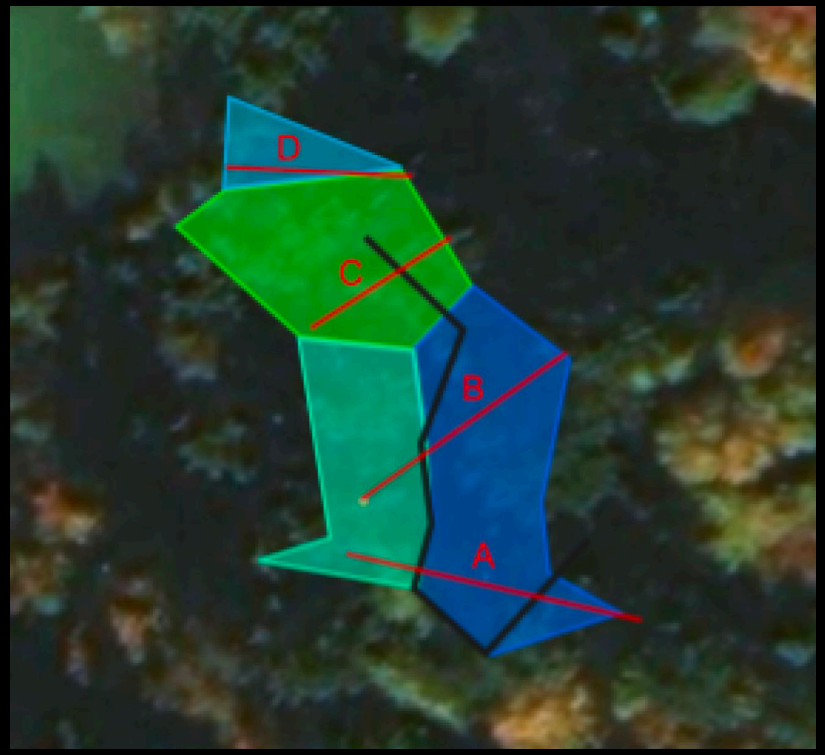
CANYON TREES BOUNCY BRIDGE SALAMANDERS

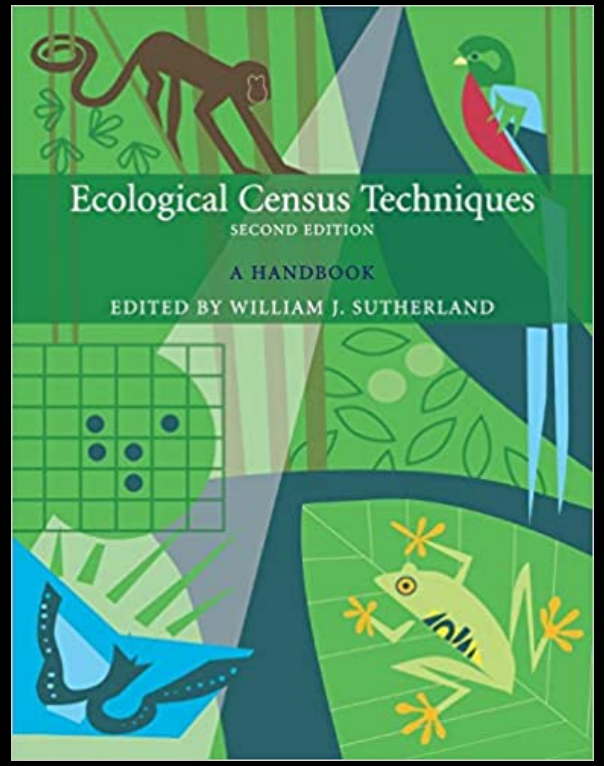
Unit II: Habitat delineation





Unit III:
Monitoring Plan





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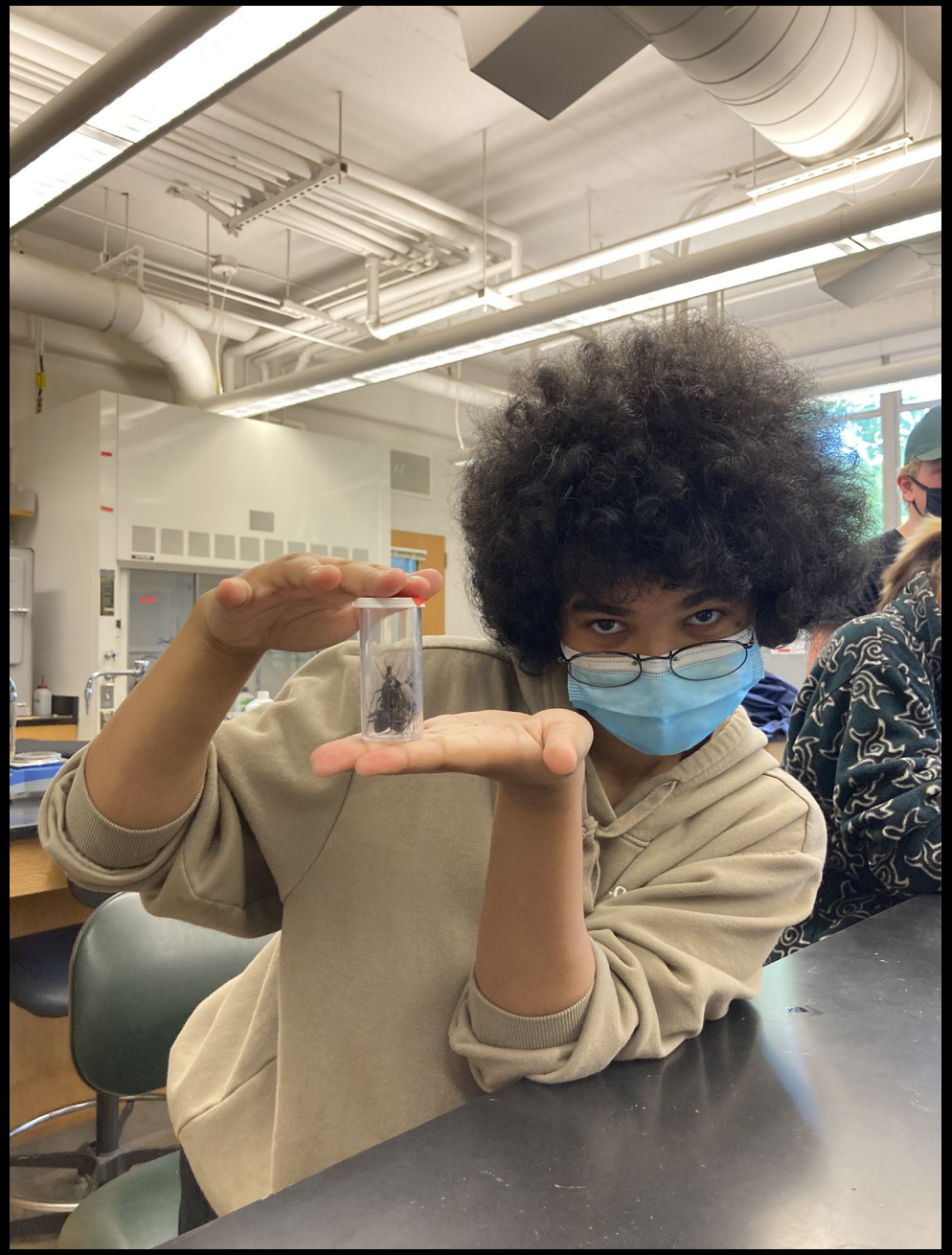
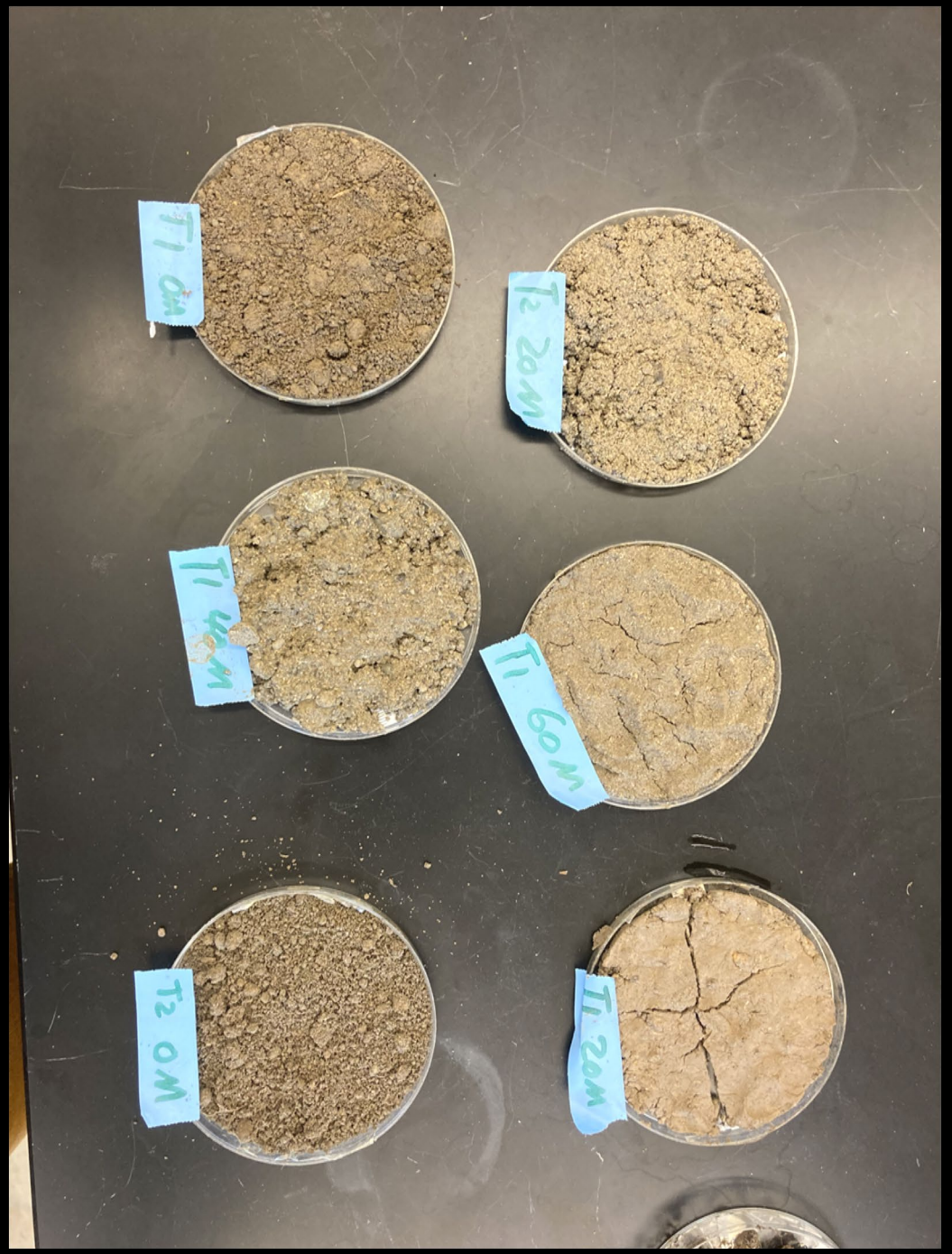



CALIFORNIA


prime
video streaming
movies and tv shows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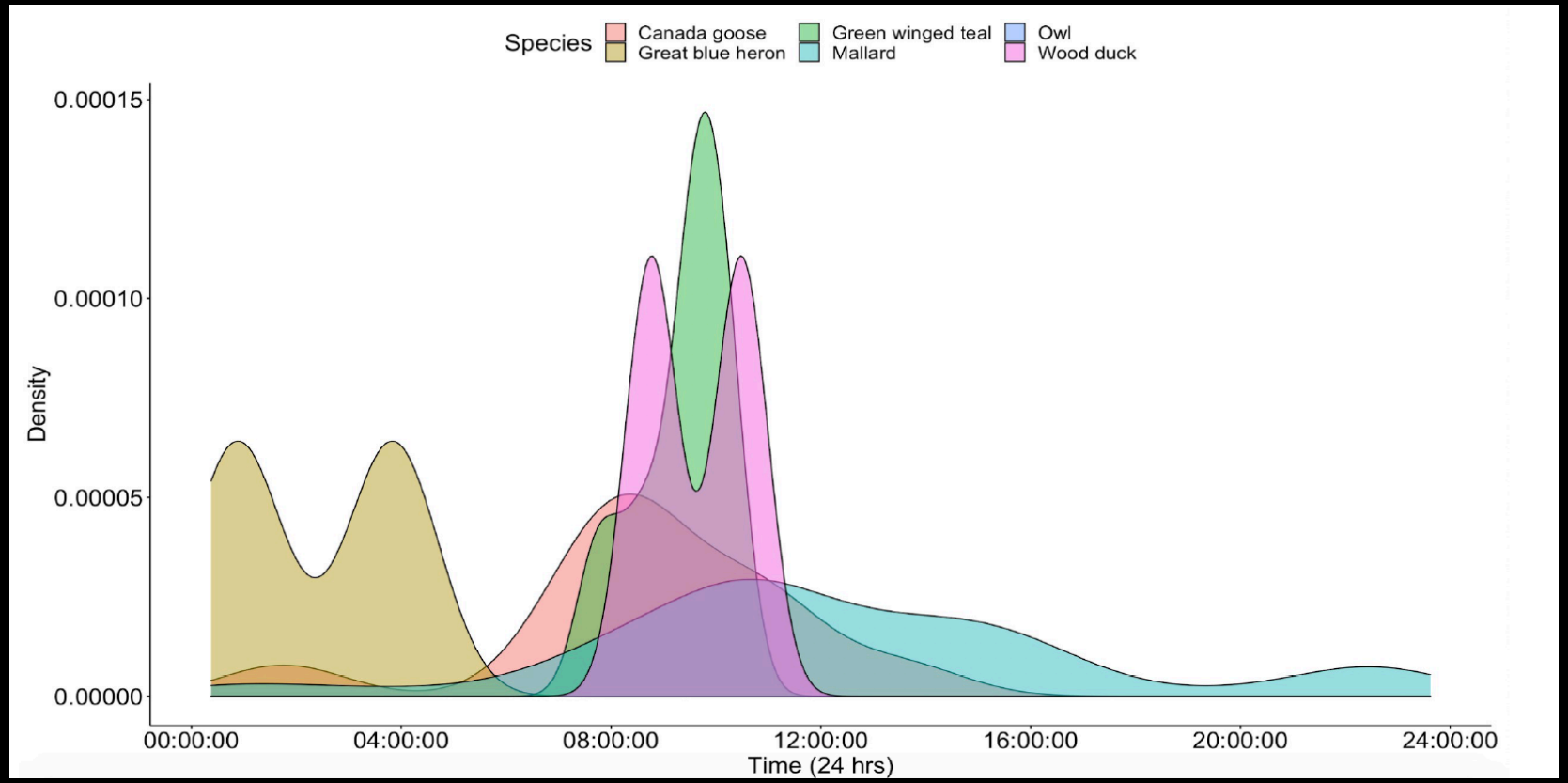
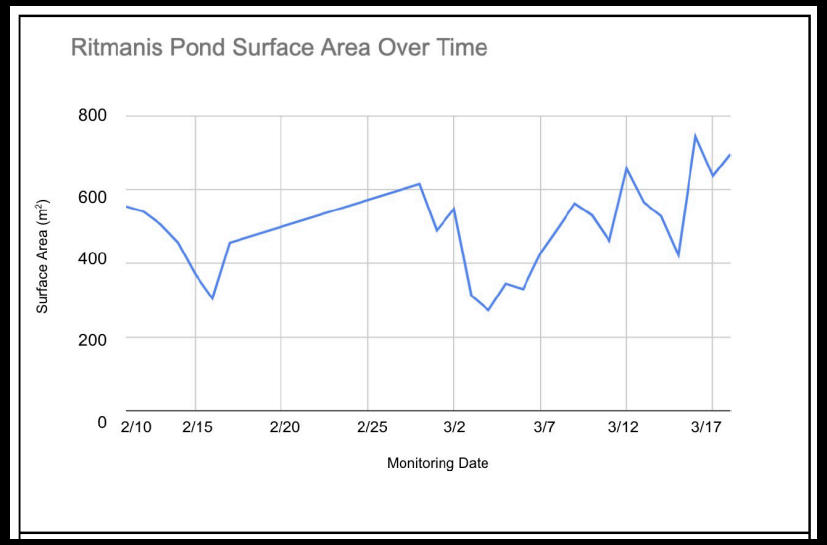
T2 20M
T1 40M
T1 60M
T2 0M
T1 20M

Unit III:
Monitoring Report





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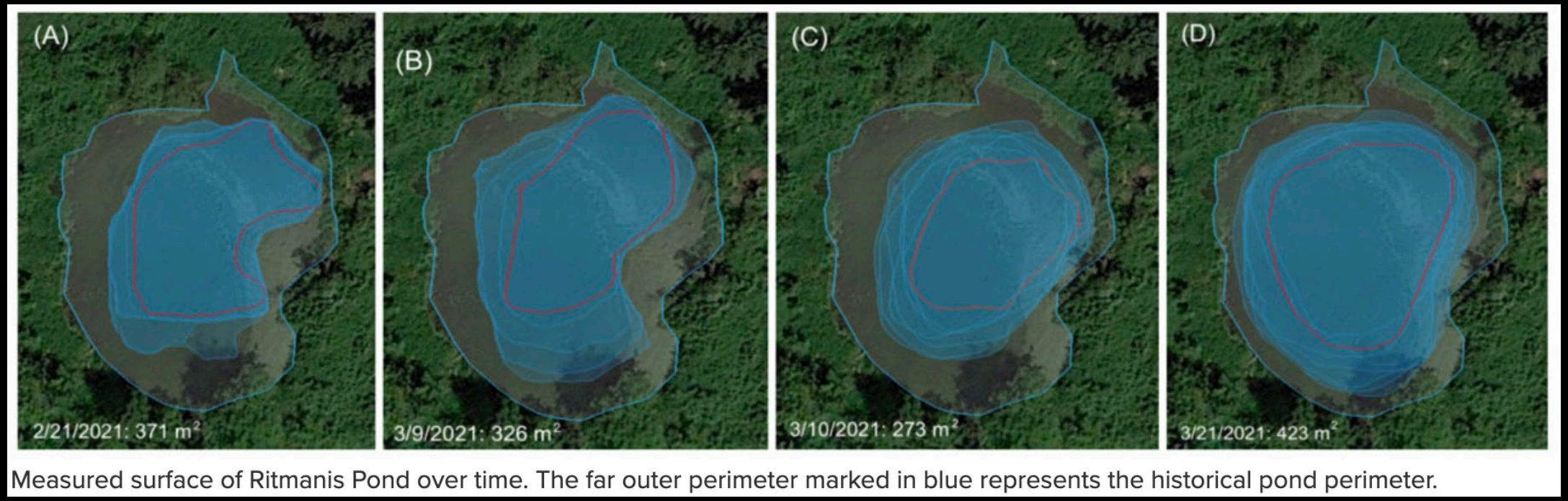
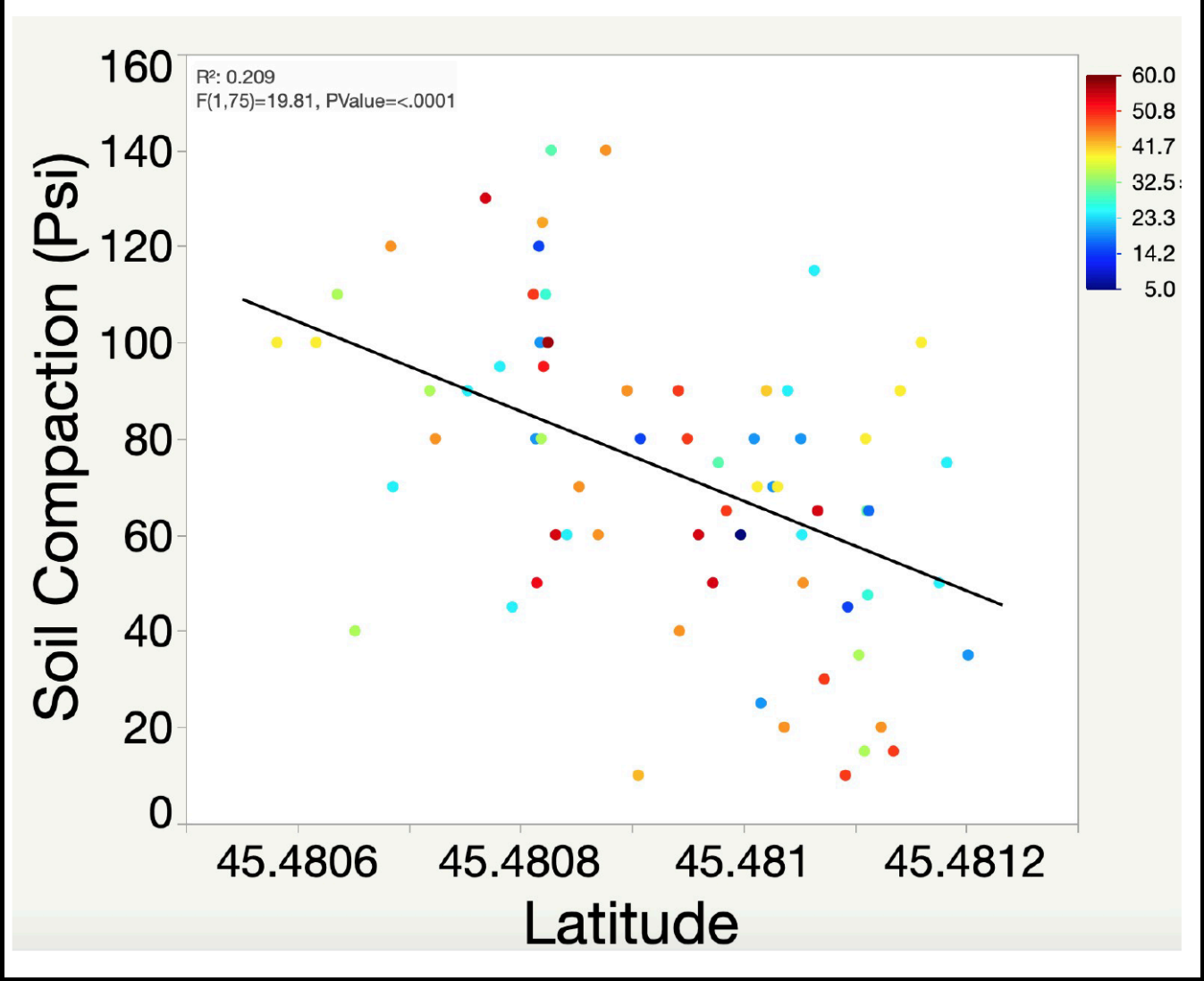


Measured surface of Ritmanis Pond over time. The far outer perimeter marked in blue represents the historical pond perimeter.



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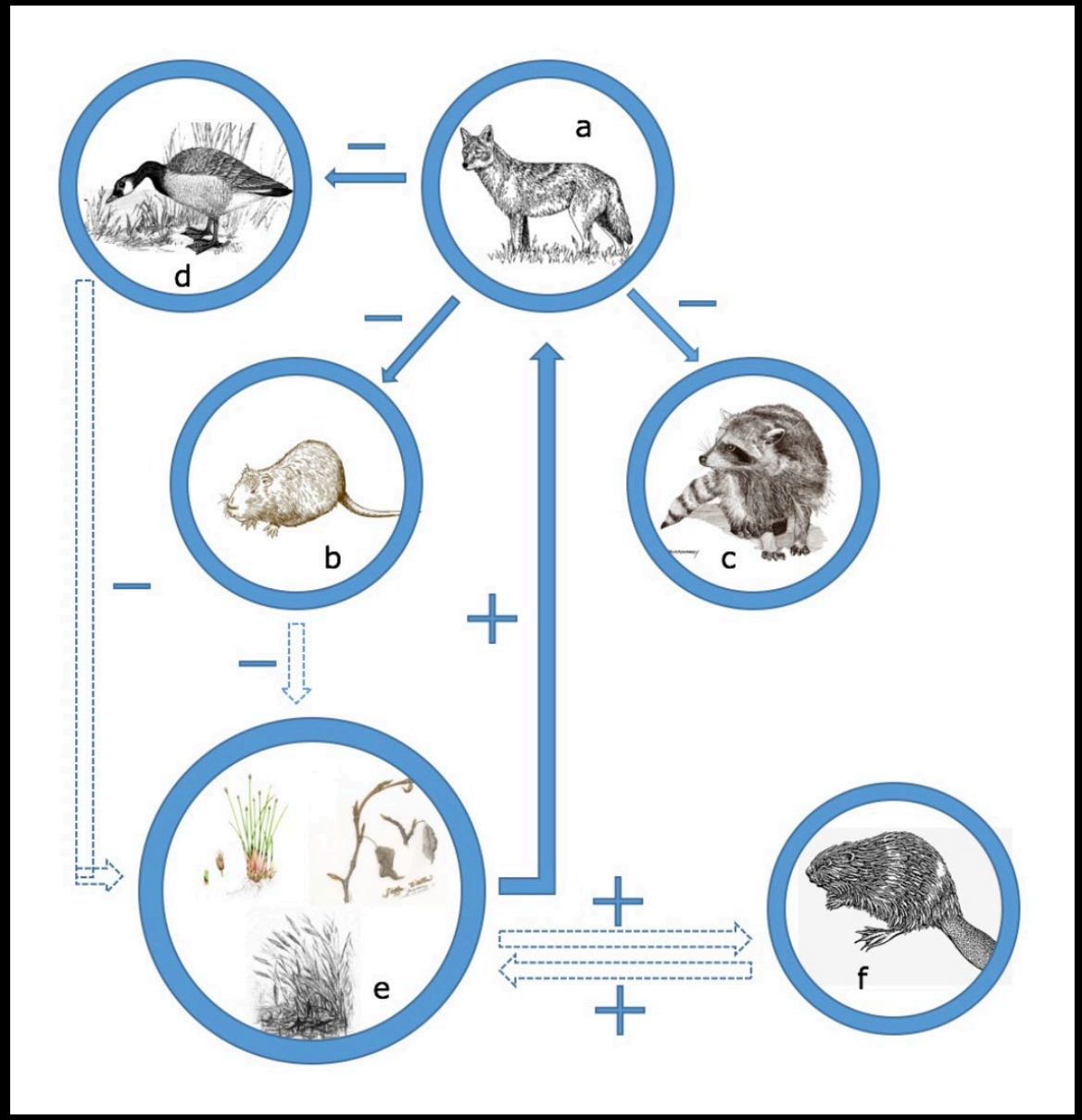

Unit III:
Monitoring Report

Unit IV: Management Trials

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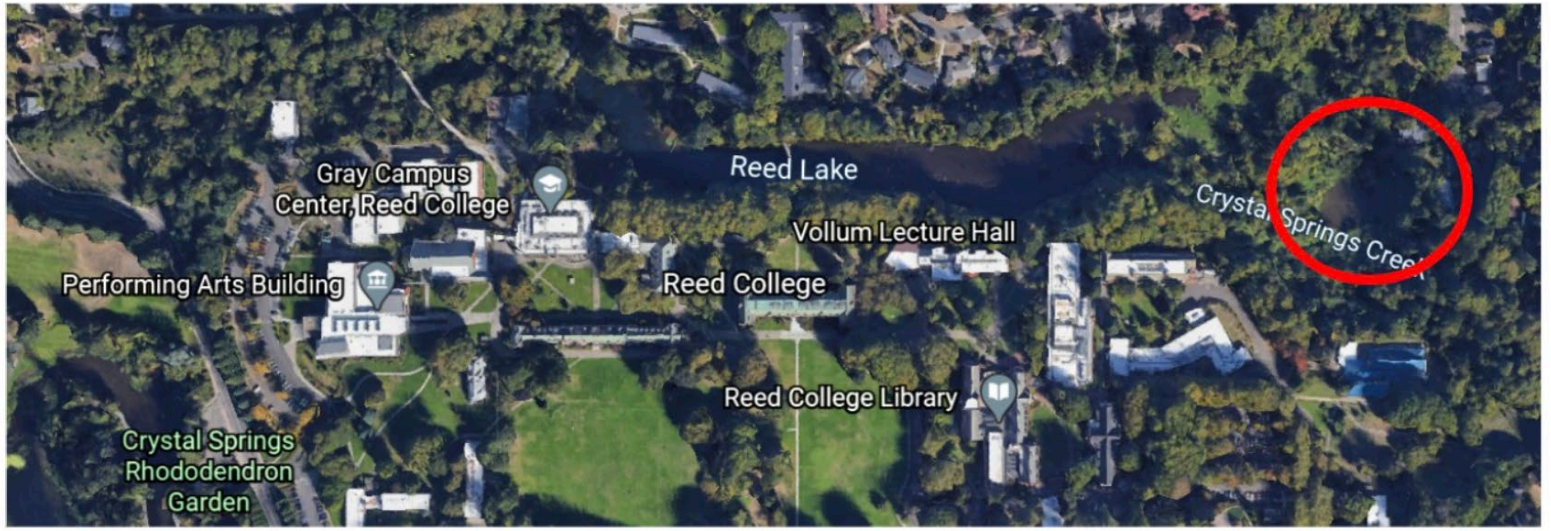
Final product: Restoration Plan

RITMANIS POND RESTORATION PLAN



Prepared by the Reed College Spring 2021 BIO308 Restoration Ecology Class

Final product: Restoration Plan

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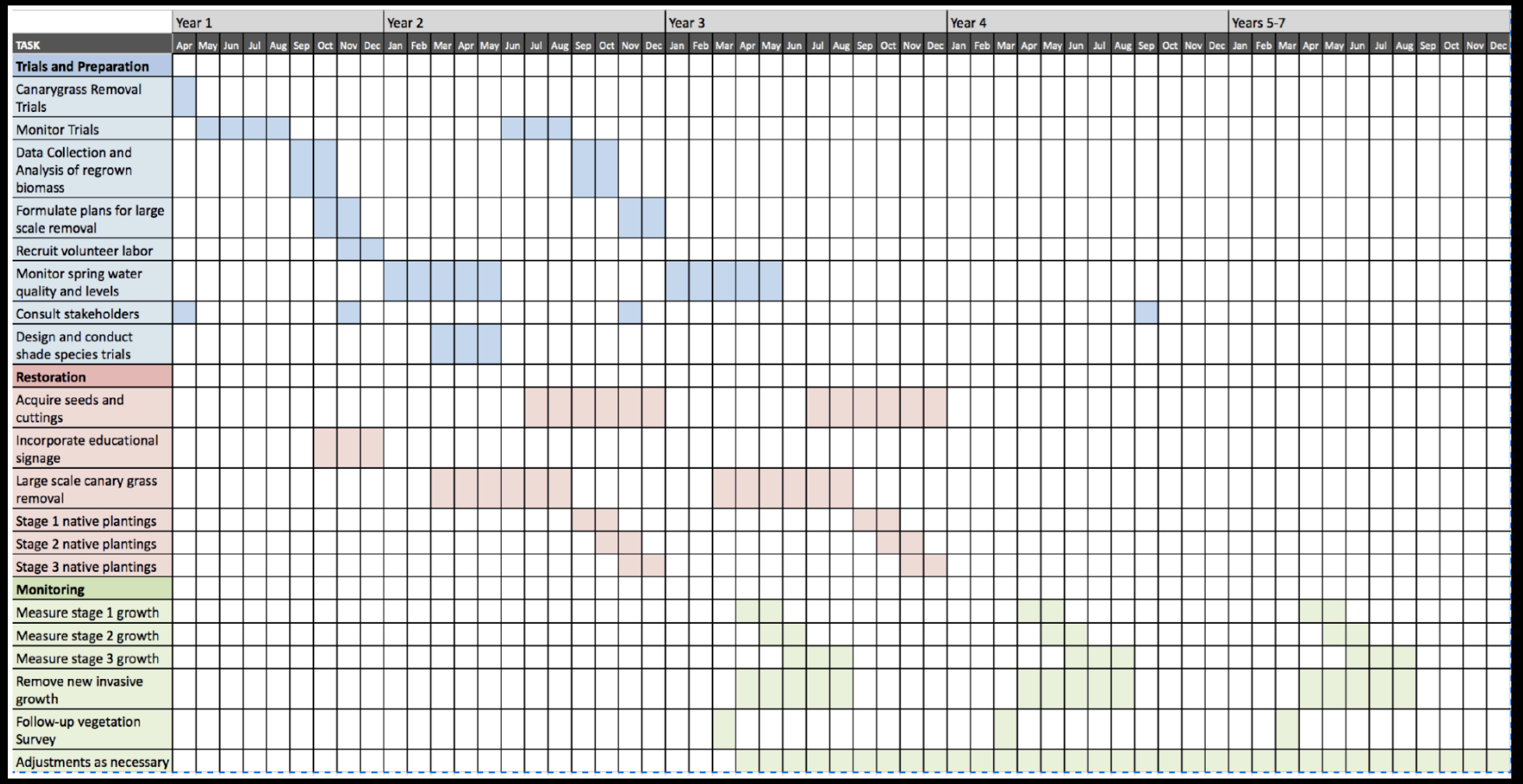
Final product: Restoration Plan

Figure 1. *Map of emergent wetland habitat unit indicating the priority/first large scale canary grass removal in orange. Areas known to be heavily trafficked by coyotes are in green.*

Final product: Restoration Plan

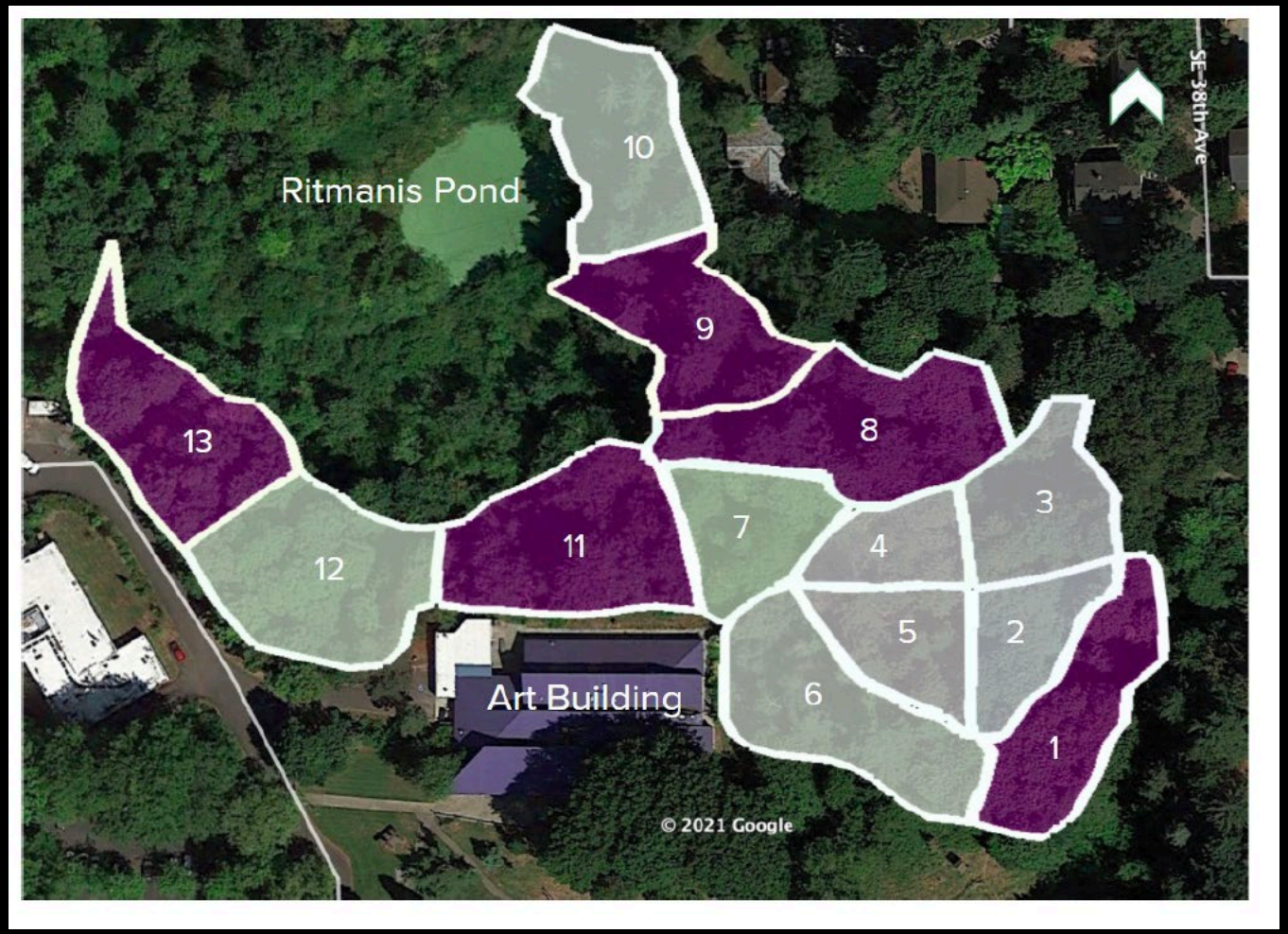


Final product: Restoration Plan

Table 1. High Cost Budget

Experimental Monitoring			$110
Labor	6hr/week student lab time	$0	$0
Biomass measurement tools	2x Long Garden Shears, Scale	2x ~$30, $50	$110
Canary Grass Removal			$18,960
Labor for canary grass removal	~2802m^2 dense canary grass, ~450 hrs	$15/hour per laborer, $25/hr per crew leader	$18,000
Expert Consulting	Zac Perry/Grounds crew/someone from Bio Dept./outside consultant	$100/hour	$400
Tools required for removal	shovels, gloves, wheelbarrows	3 x $80 Wheelbarrow, 8 x $35 Flat Shovels, 8 x $5 Gardening Gloves	$560
Native Plantings			$10,266
Labor for live stake propagation	~1,400m^2 to plant, ~40 hrs	$15/hr per laborer, $25/hr per crew leader	$800
Labor for rooted plantings	~1,400m^2 to plant, ~117 hrs	$15/hour per laborer, $25/hr per crew leader	$4,670
Tall mannagrass	88	$6-8 per plant	$704
Slough sedge	88	$6-8 per plant	$704
Beaked sedge	88	$6-8 per plant	$704
Fruited bulrush	88	$6-8 per plant	$704
Pacific willow	44 cuttings, ~15 hours	$15/hour per laborer	$660
Sitka willow	44 cuttings, ~15 hours	$15/hour per laborer	$660
Pacific ninebark	44 cuttings, ~15 hours	$15/hour per laborer	$660

Final product: Restoration Plan



Final product: Restoration Plan

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Removal of ivy, blackberry, and other invasive growth	✓ (zones 9, 10, 1) **fall/winter**	✓ (zones 8, 7, 6, 3) **fall/winter**	✓ (zones 5, 4, 2) **fall/winter**	✓ (zones 11, 12, 13) **fall/winter**		
Prevent reestablishment of ivy, blackberry, and other invasive growth through monitoring and removal					✓ (all zones) **fall/winter**	✓ (all zones) **fall/winter**
Plant understory species	✓ **spring**	✓ **spring**	✓ **spring**	(✓) *as needed	(✓) *as needed	(✓) *as needed
Plant saplings (ie. Douglas fir)	✓ **spring**					
Consult with Stakeholders	✓	✓	✓	✓	✓	✓
Continued monitoring for	✓	✓	✓	(✓)	(✓)	
implementation of trail				*trail creation*	*trail creation*	

Final product: Stakeholder Roundtable

- Dec 9th, 2021 9-10 am via Zoom
- See you there!