Riparian Restoration and Beyond

Strategies for Effective Stewardship

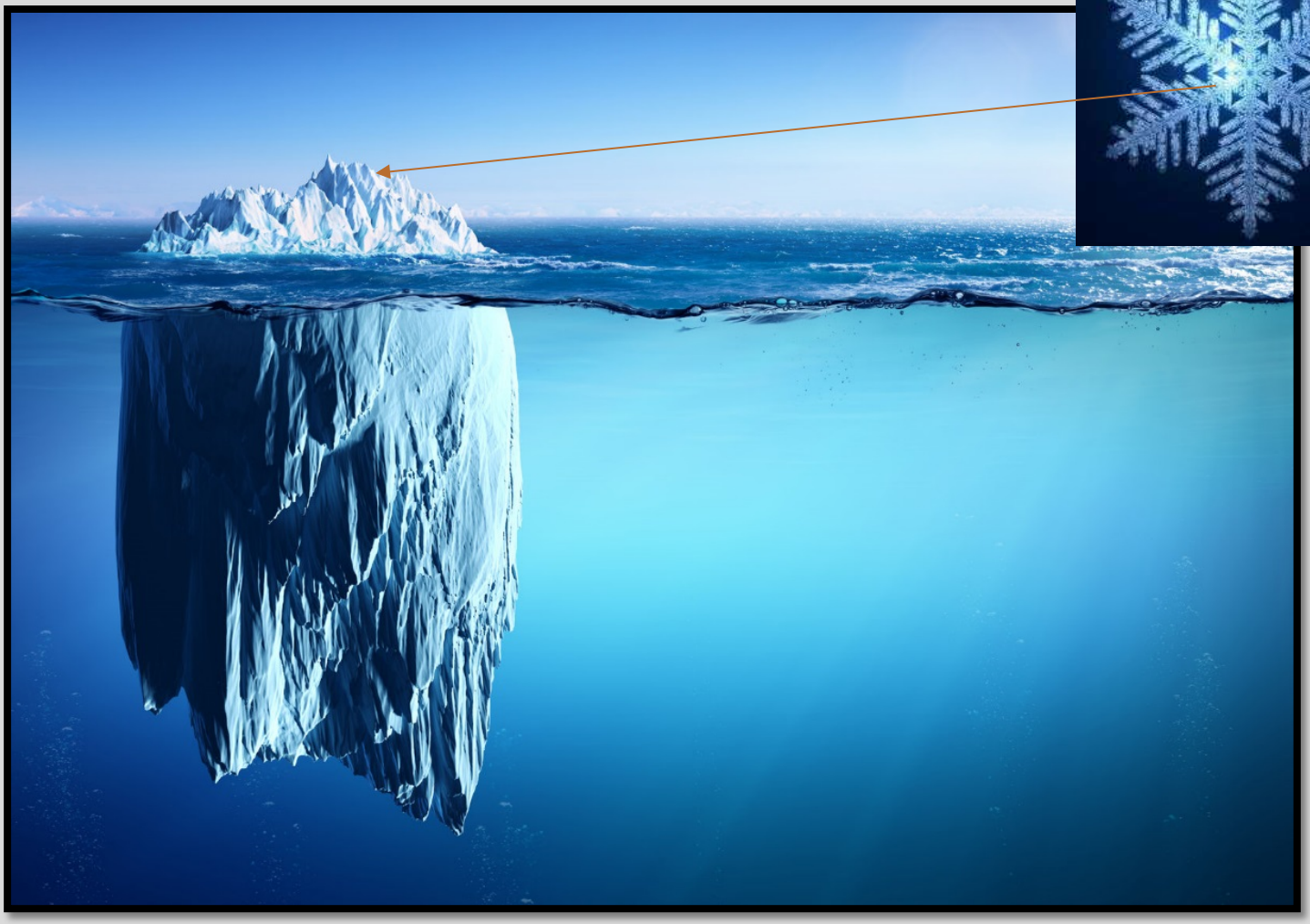
John Richard Goetz III
Water Resources Project Manager

Clean Water Services

Outline

- Introduction
- Site Specific Implementation Strategy
  - Vegetation Management
  - Long term on-call contracts
- Project Management
  - Where to Begin?
  - Springville Creek
  - Bronson Creek

Introduction



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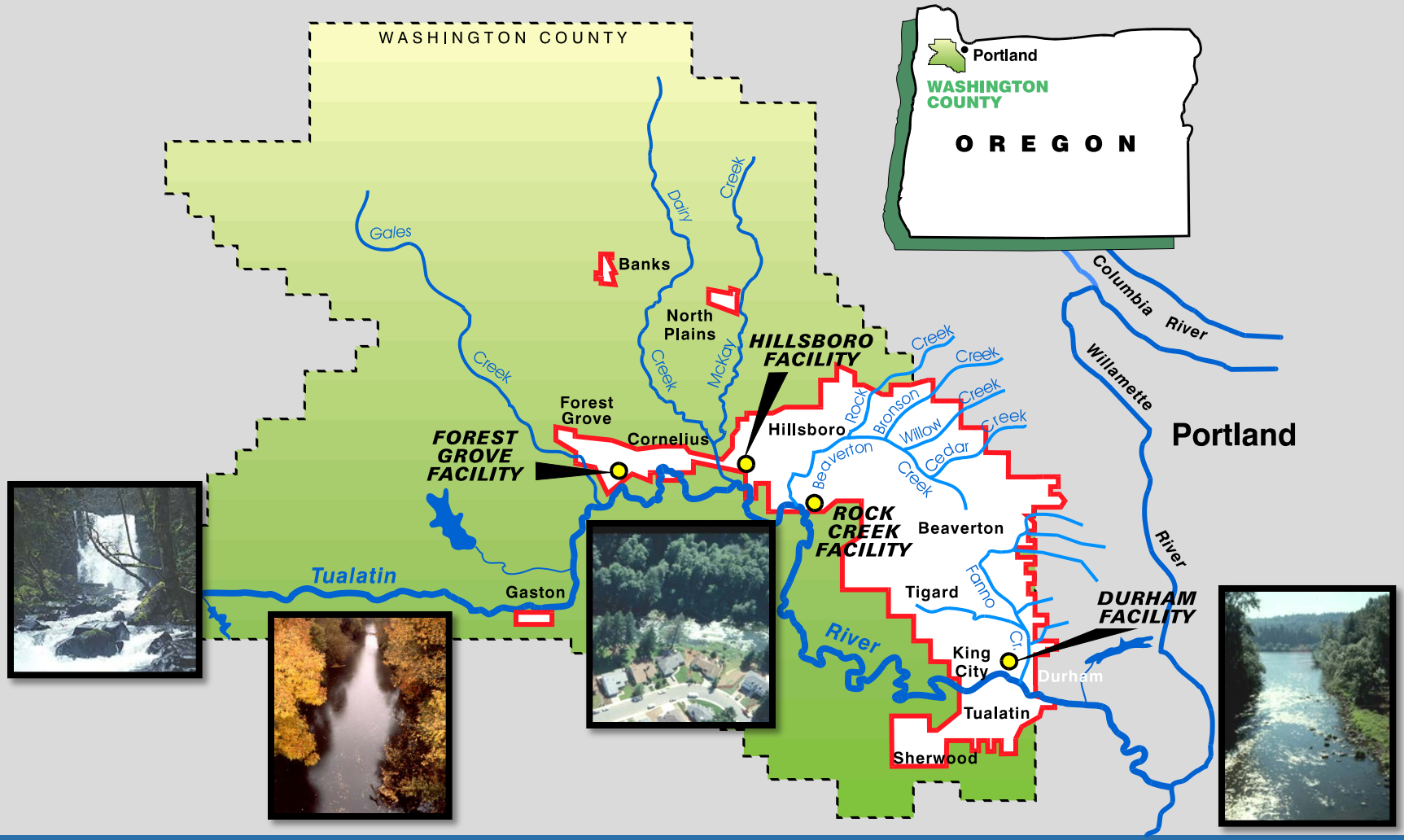

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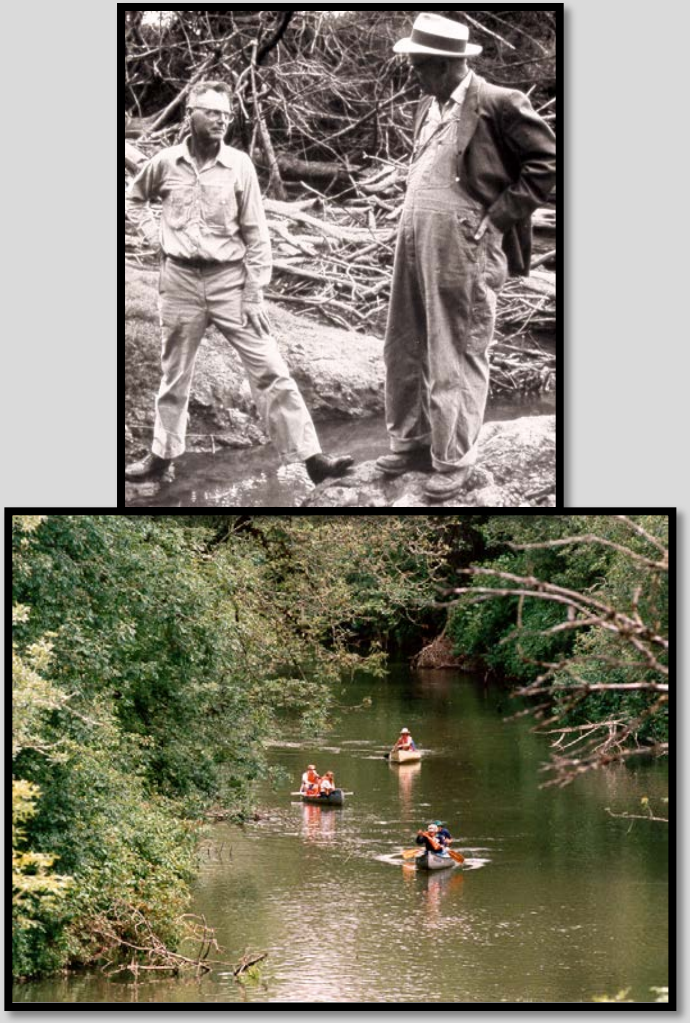
- On a watershed basis
  - Evaluating needs
  - Prioritizing activities
  - Coordinating actions
- Look at water quality, water quantity and aquatic habitat in a comprehensive manner



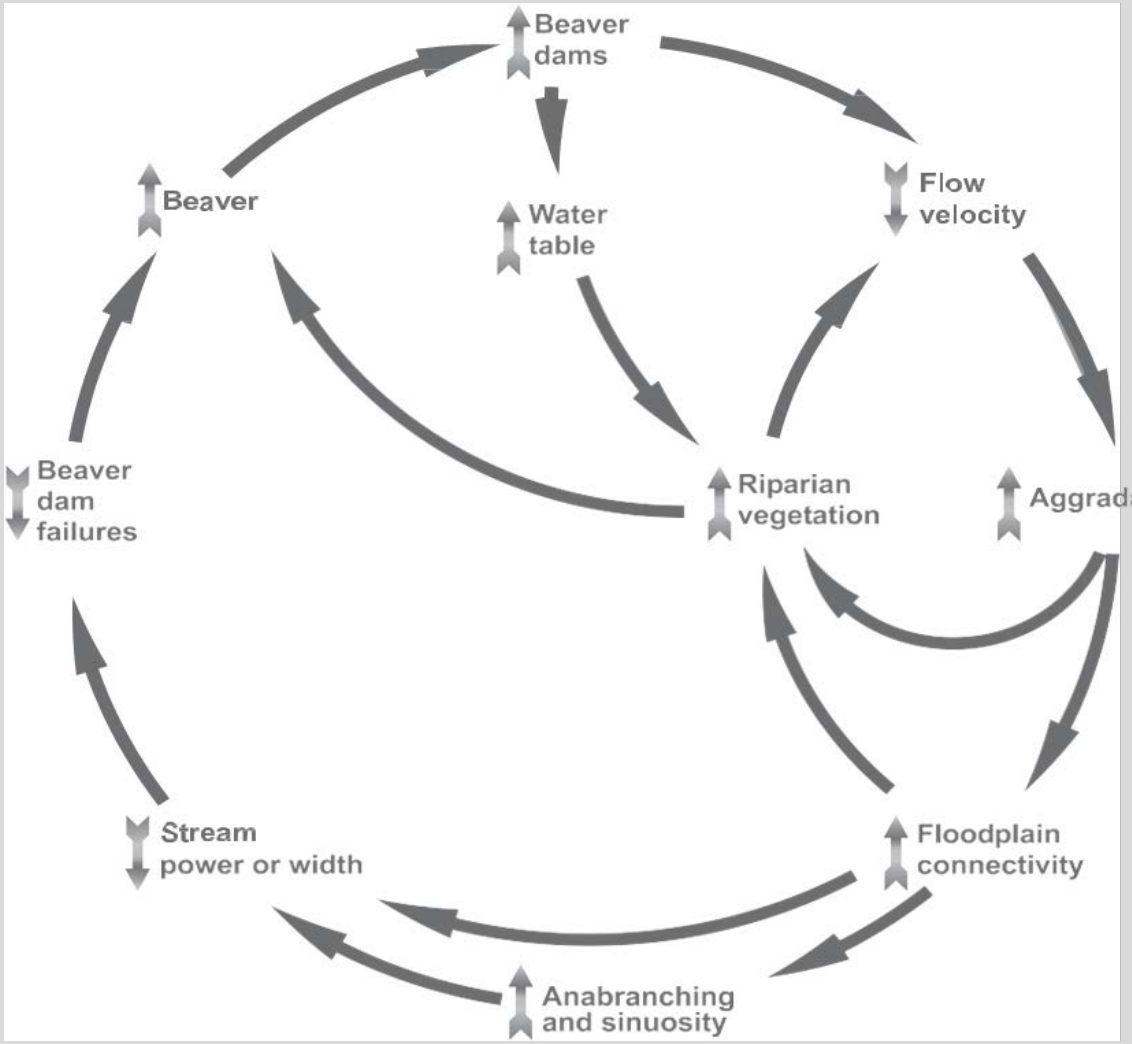
Meet John Richard Goetz III

- Forestry and Plant Pathology
- Natural resources career
  - WSU – Research Assistant
  - USFS - Forestry Technician
  - ODF - Forester
  - Ash Creek - Forester
  - CWS – Project Manager

Current Approach

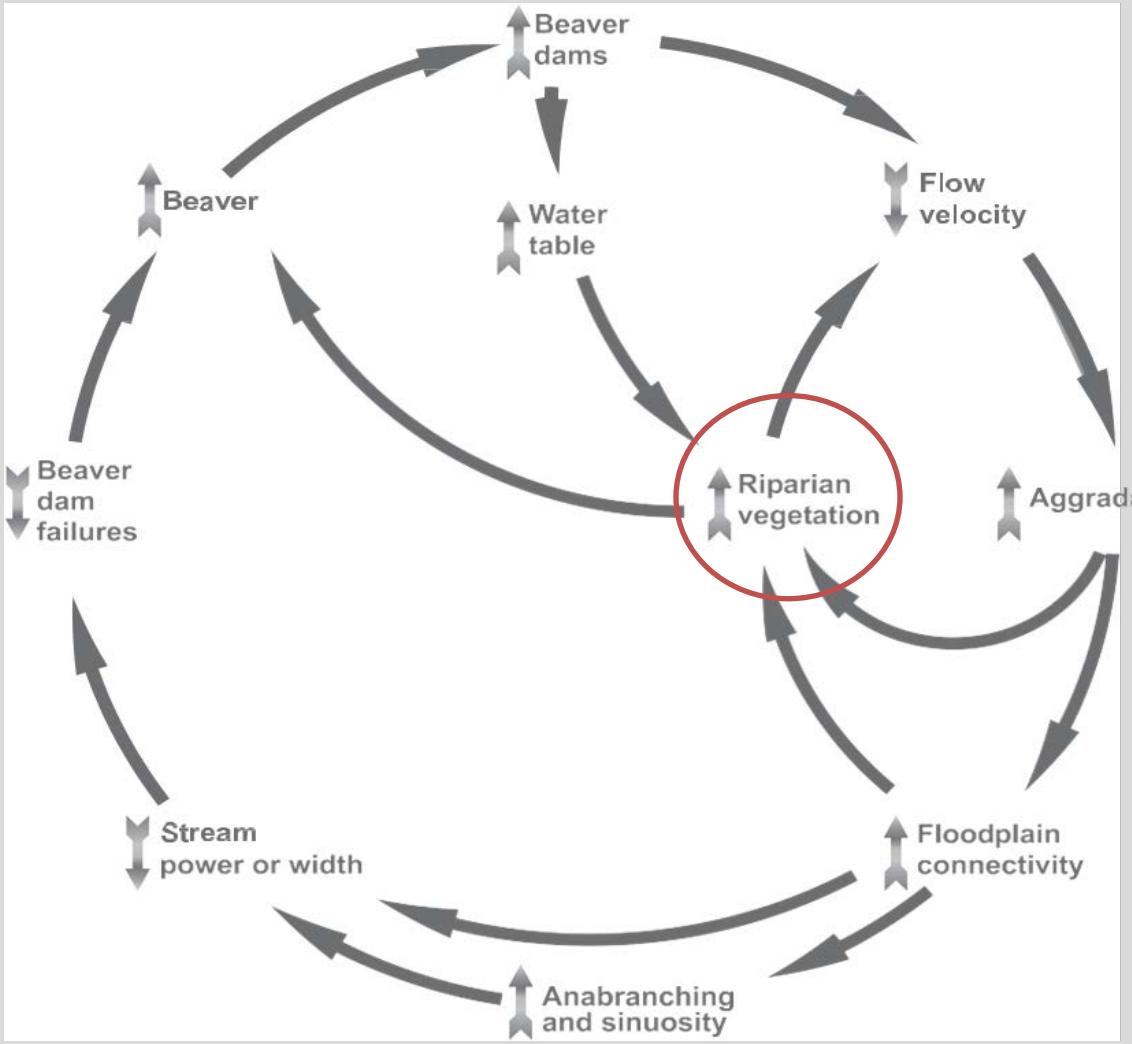
Reestablish ecological processes to facilitate trajectory towards high functioning reference conditions

Current Approach



Pollock, *et al.* 2014 *Bioscience*

Current Approach



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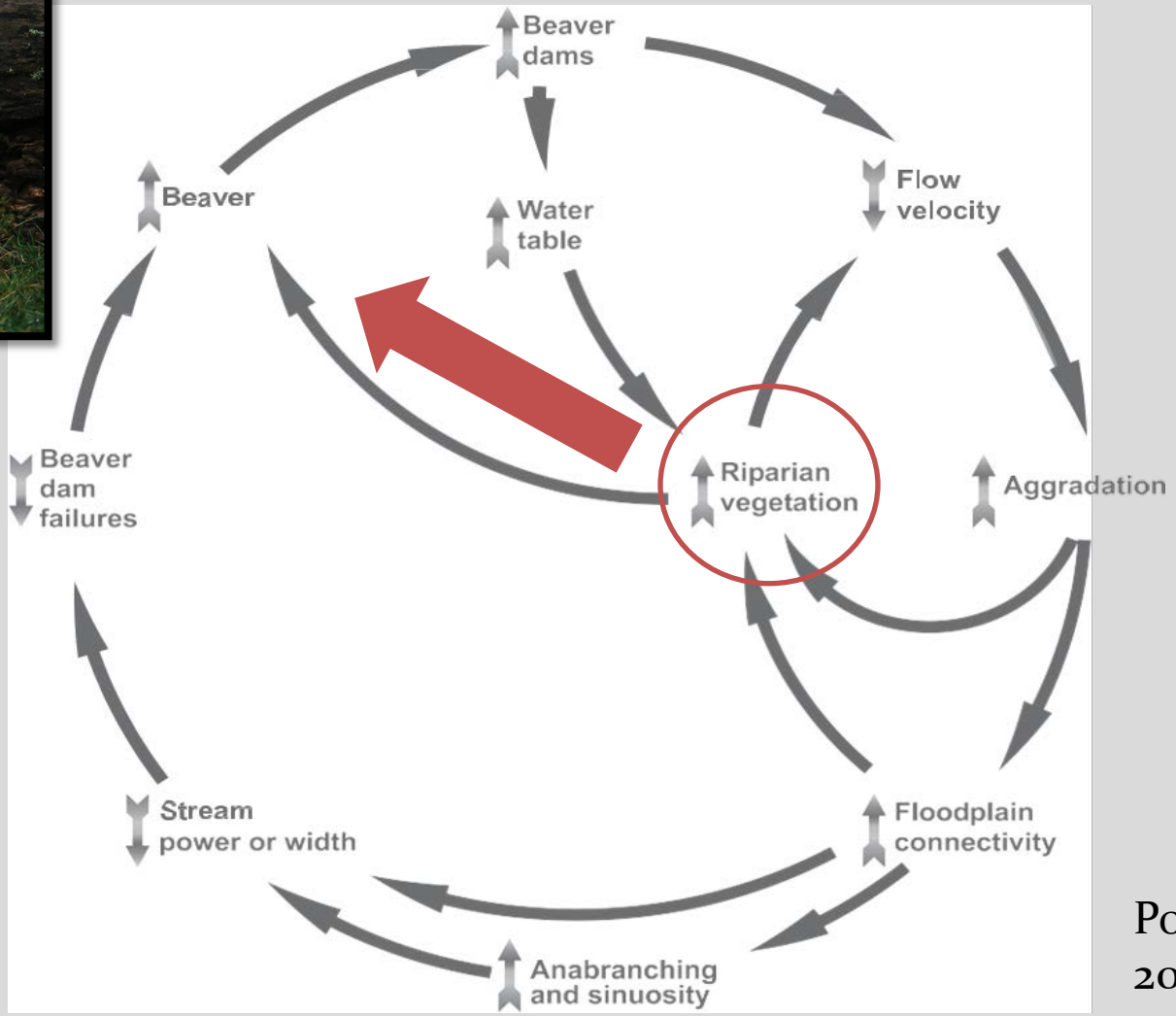

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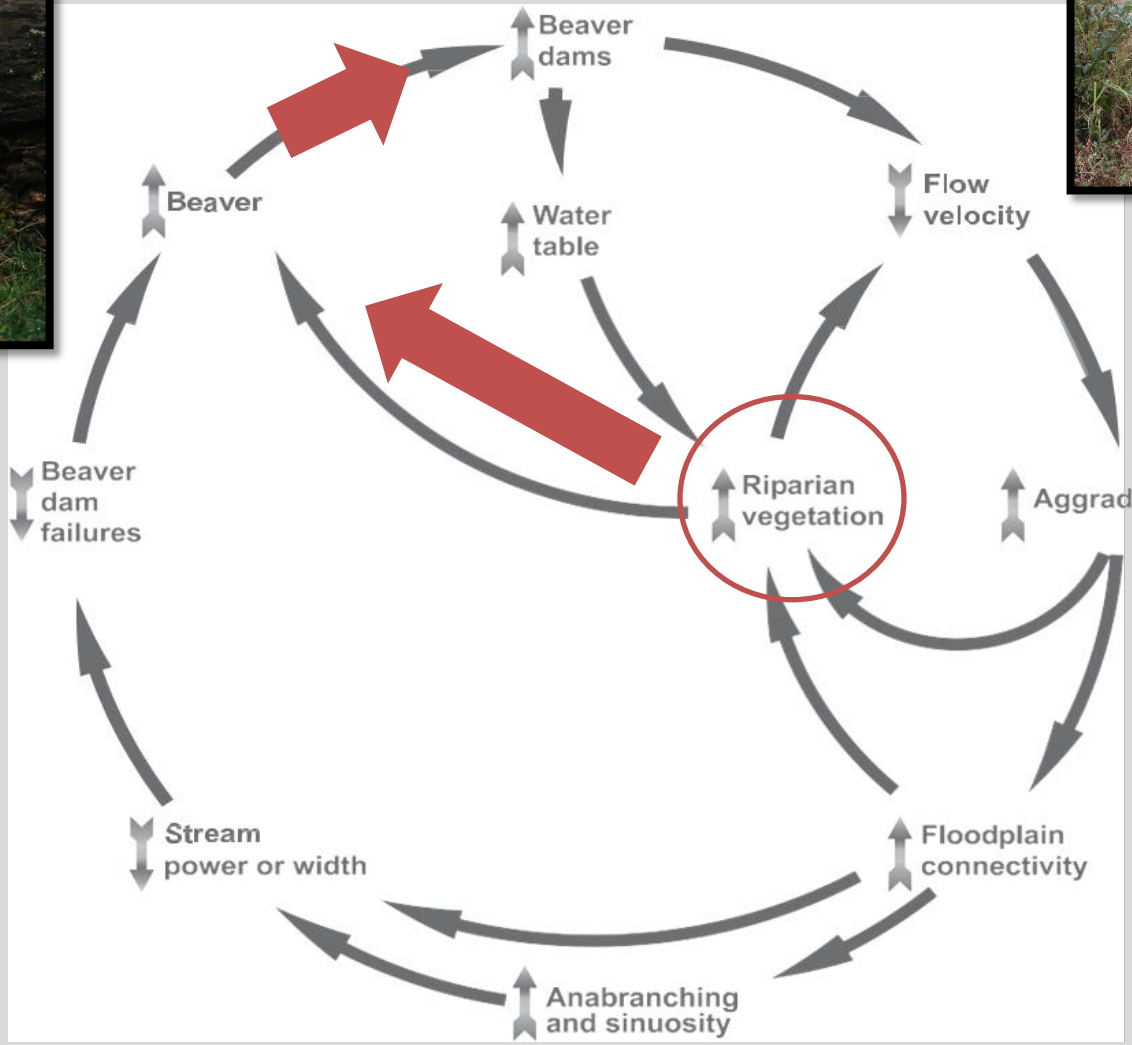
Current Approach



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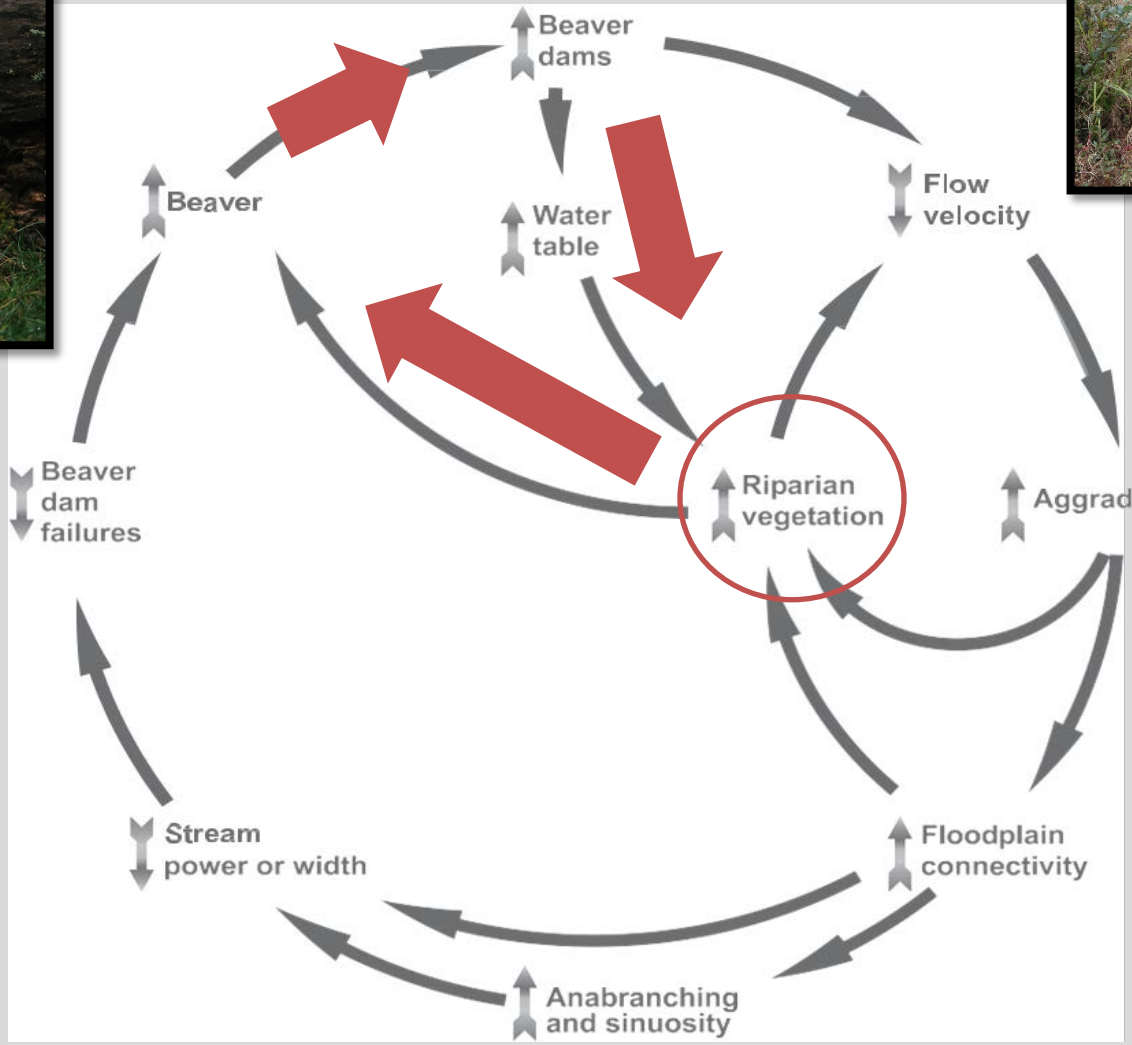
Current Approach



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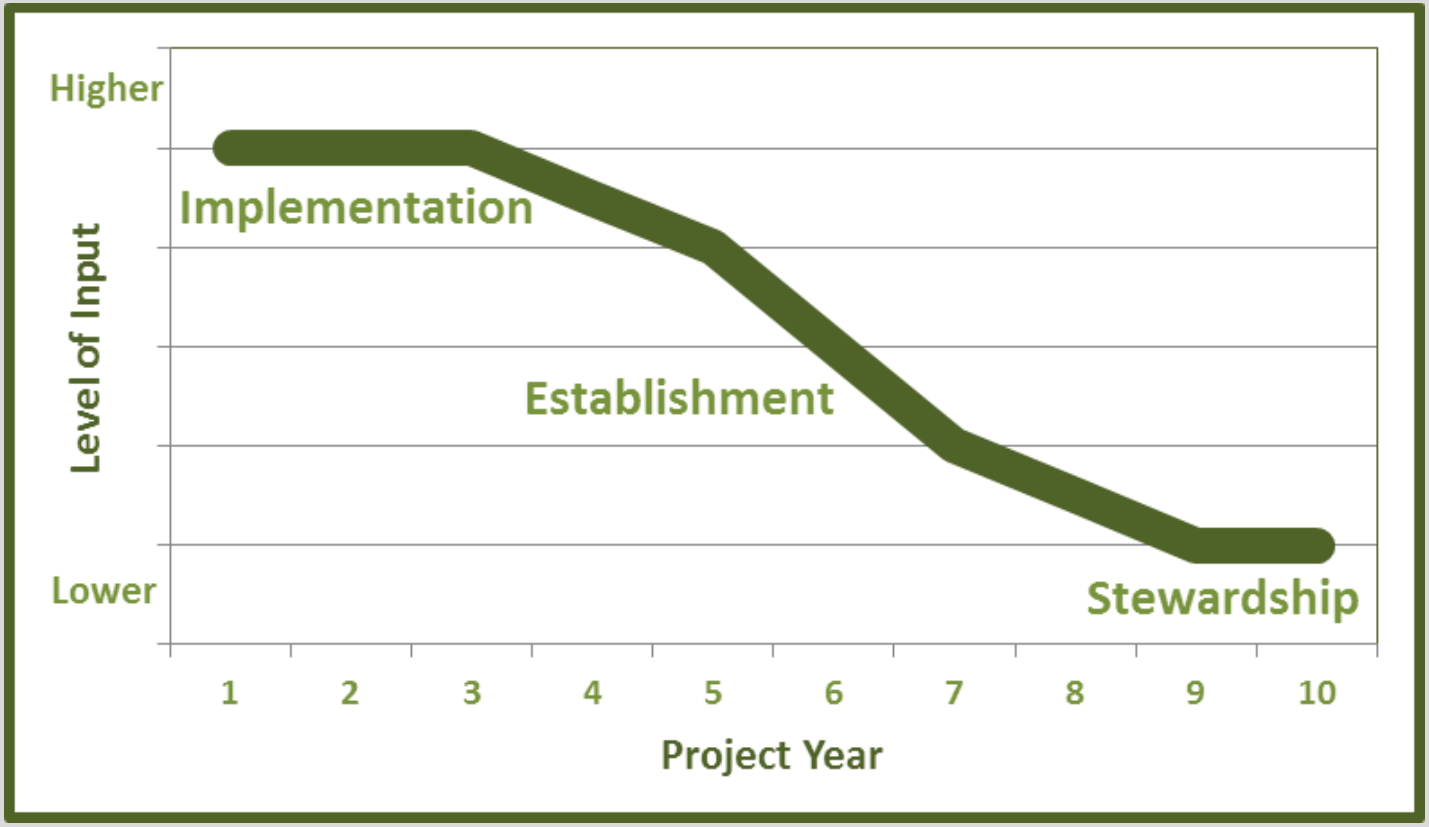
Vegetation Management



Vegetation Management

- Things we strive to do
  - Visit, study and review
  - Front load treatments
  - Bareroot Plants
  - Collaborate
  - Anticipate
  - Innovate
  - Partner
  - Access
  - Share

Vegetation Management

- **Things we attempt to avoid**
  - Ignoring contractor advice
  - Containerized plants
  - Survival as success
  - Plant accessories
  - Regular mowing
  - Skip site prep
  - Stagnation
  - Irrigation

Vegetation Management

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Closed Container System

- Reusable 15 gallon container with:
  - One-way valve
  - Serial bar code for tracking purposes
  - Product dedicated and labeled accordingly

Closed Container System

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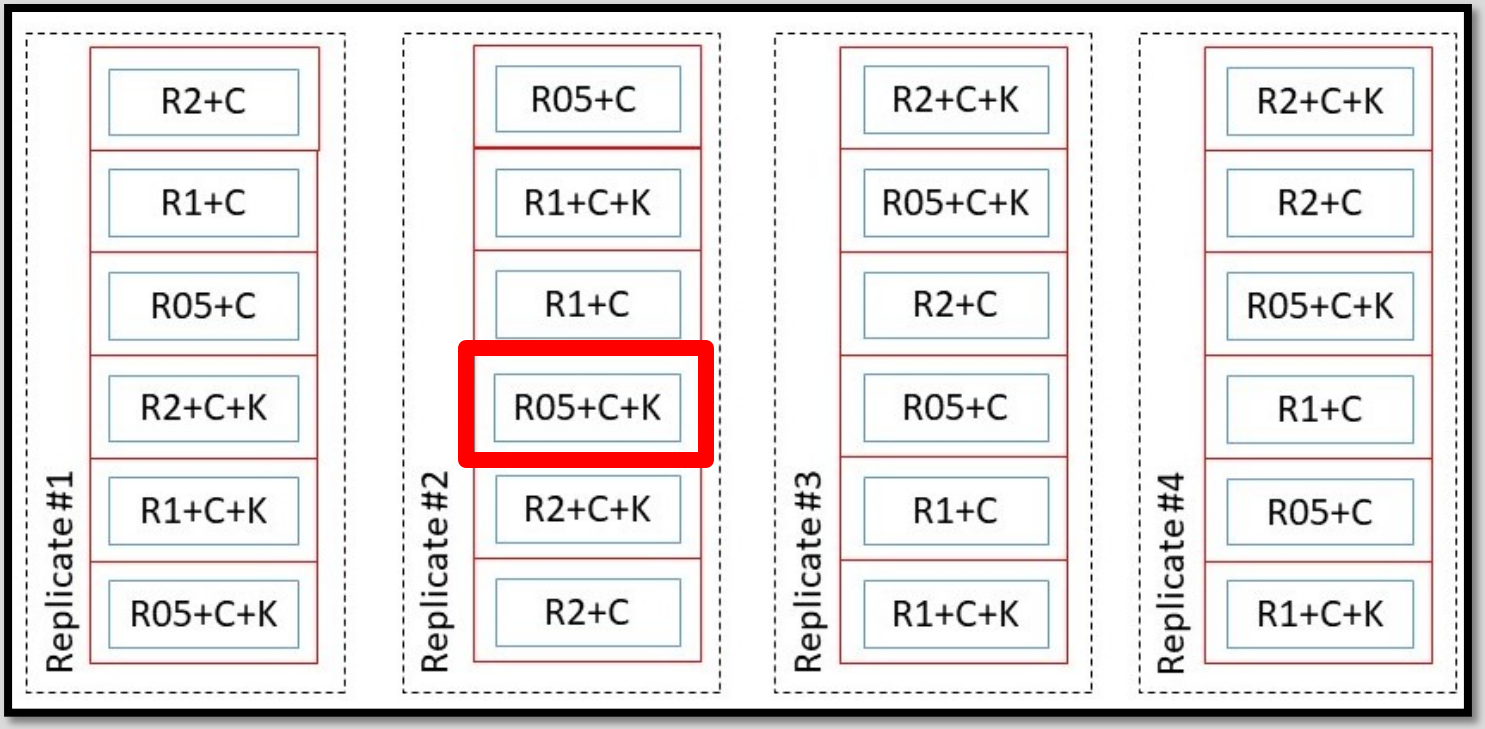
Closed Container System

Contractor provided		Closed Container System	
Chemical	**Price per Gallon plus 10%**	**Chemicals**	**Price per Gallon**
Vastlan only	**$82**	Vastlan + EP90 and indicator dye	**$73**
Rodeo only	**$20**	Rodeo + EP90 and indicator dye	**$28**

Herbicide reduction trials



Vegetation Management - Reference Sites

Watershed Revegetation Program

Plant Data: Gresham Woods Data Collected 6/5/01

Overall trees per acre (T.P.A): 260

Species	T.P.A.
Alnus rubra	190
Psuedotsuga menziesii	35
Thuja plicata	25
Prunus emarginata	5
Abies grandis	5

Total shrub stems per acre (S.P.A.): 4800

Species	S.P.A.
Rubus spectabilis	3250
Corylus cornuta	250
Oemlaria cersiformis	600
Sambucus racemosa	400
Acer circinatum	250
Symphoricarpos albus	50

Overall herbaceous cover: 70%

Species	Avg.%cover
Tolmiea menziesii	25
Dicentra formosa	11
Impatiens campenstris	9
Oenanthe sarmentosa	8
Circaea alpina	4
Rubus ursinus	3
Polystichum munitum	2.5
Montia sibirica	2
Hydrophyllum tenuipes	2
Carex obnupta	1

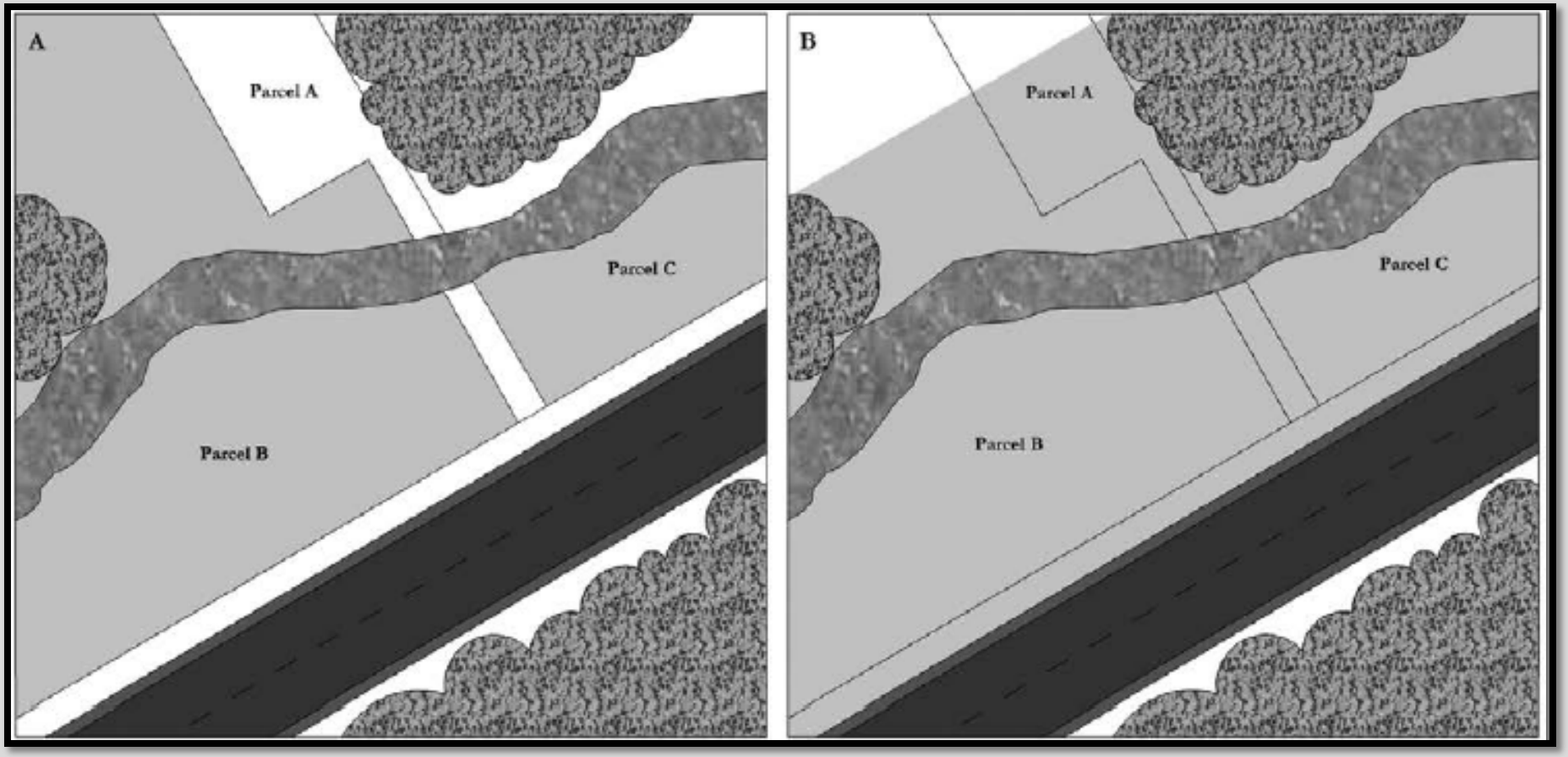
Herb. traces found
Carex deweyana
Pteridium aquilinum
Athyrium filix-femina
Galium aparine

Community type: Mixed hardwood/conifer riparian

NVCS alliance: Alnus rubra Temporarily Flooded Forest

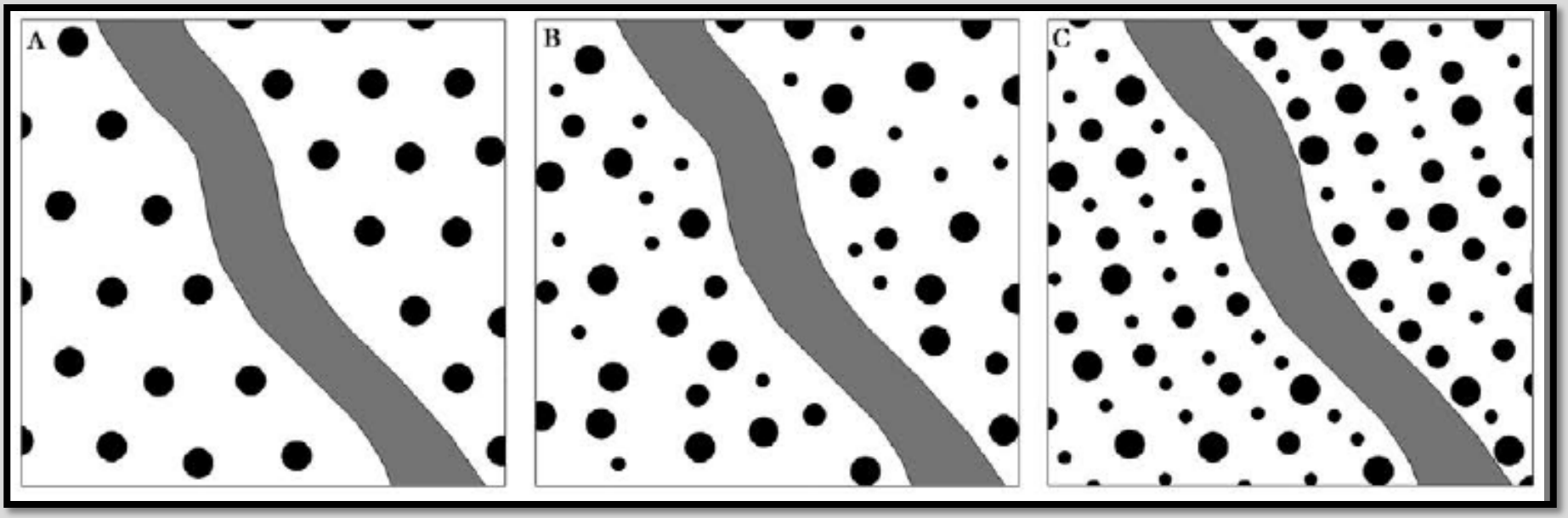
1851 Classification: FFHCBu: Mesic mixed conifer forest with mostly deciduous understory. Burned.

Vegetation Management - Boundaries



Guillozet et al. 2014

Vegetation Management - Planting



Guillozet et al. 2014

Monitoring – Wildlife

- Urban Beavers
  - USGS
- Birds
- Other wildlife

Monitoring - Vegetation

- Qualitative
  - Photo points
- Quantitative
  - 1/100th acre plots
  - 1 plot per acre
  - Density
  - Diversity
  - Introduced species

Monitoring - Vegetation

Plant Community Type	Invasive Species (%)	Composition/ Diversity /Structure (# native sp.)	Canopy	Native Aerial Cover (%)
Emergent Wetland	≤ 20	≥ 5 herbaceous	NA	≥ 90 herbaceous
Scrub-Shrub Wetland	≤ 20	≥ 5 shrubs ≥ 3 herbaceous	≥85 %	NA
Forested Wetland	≤ 20	≥ 5 shrubs ≥ 3 trees ≥ 3 herbaceous	≥85 %	NA
Riparian Forest	≤ 20	≥ 5 shrubs ≥ 3 trees ≥ 5 herbaceous	≥85 %	NA
Upland Forest	≤ 20	≥ 5 shrubs ≥ 3 trees ≥ 5 herbaceous	≥85 %	NA
Oak Woodland	≤ 20	≥ 5 shrubs ≥ 1 trees ≥ 3 herbaceous	≥85 %	NA
Oak Savanna	≤ 20	≥ 1 trees ≥ 5 herbaceous	NA	≥ 80 herbaceous
Wet Prairie	≤ 20	≥ 5 herbaceous	NA	≥ 80 herbaceous

Geomorphology

- **Energy Dissipation & Grade Control**
  - Vegetation
  - Wood
  - Beaver Dams
  - Avoid channel disturbance
  - Floodplain connectivity

Long term contracts

- Up to 5 years
- Competitive bids
  - Professional consulting services
  - Community based organizations
  - Vegetation Management

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New Projects – Where to Begin?

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New Projects – Where to Begin?

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New Projects – Where to Begin?

- Visit the site!
- Public perceptions
- Management plans
  - Peer review
- Anticipate disturbance
- Crews and equipment
- Performance metrics

New Projects – Where to Begin?

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New Projects – Where to Begin?

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Springville Creek

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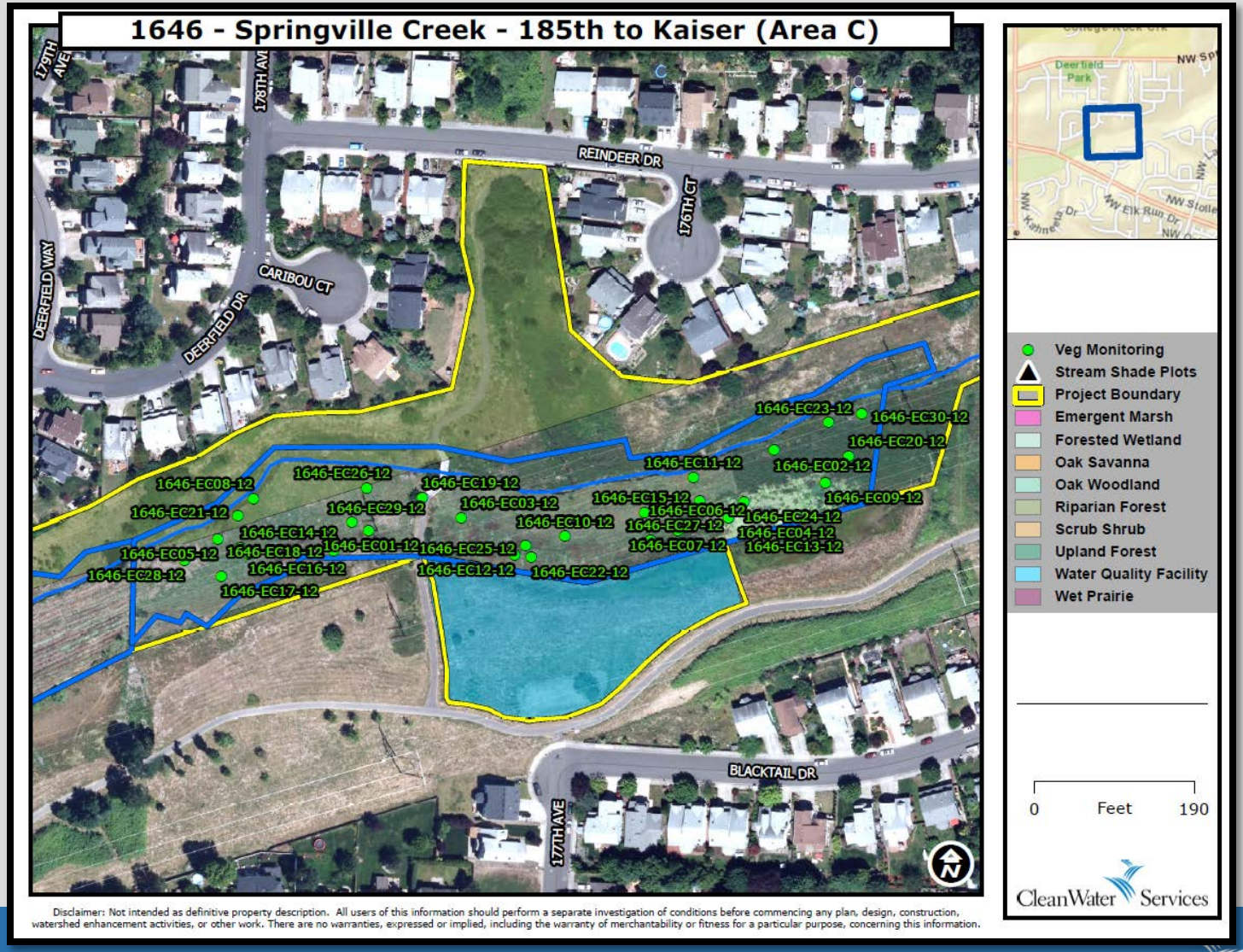

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Springville Data

Springville - 185th to Kaiser	Traditional site preparation (planted 2011)		Trends	1.5 years of site prepration + native seed (planted 2011)		Trends	2.5 years of site preparation + native seed (planted 2012)		Trends
	2012	2014		2012	2014		2012	2014	
Stems per acre	1730	1030	↓	1220	976	↓	1076	1386	↑
Native woody cover	14.0%	14.6%	↔	14.3%	12.9%	↓	4.1%	15.8%	↑
Native herbaceous cover	43.0%	8.7%	↓	69.9%	48.7%	↓	75.7%	81.0%	↑
Invasive species cover	48.8%	84.5%	↑	23.3%	28.8%	↑	19.6%	2.3%	↓
Vegetative shade	2.2%	2.7%	↔	6.1%	11.4%	↑	3.5%	23.3%	↑
Native species diversity	2	1	↓	4	3	↓	5	6	↑

n=30, 1/100th acre plots

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Bronson Creek

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Bronson Creek Data

Project Number: 2135	Project Name: Bronson Creek Greenway	
Project Acres: 36.28		Survey Year: 2017
Initial Planting Year: 2013	Credit Year: 2015	TMP Enrolled: Yes

Summary of Current Conditions by Plant Community Type

Plant Community: Forested Wetland		**Prevalence Index: 3.0**	**Phase: Establishment**
Tree Diversity: 2	Shrub Diversity: 5	Herbaceous Diversity: 1	Vegetative Shade: 75.0 %
Stems per Acre: 3,656	Woody Cover: 79.7 %	Herbaceous Cover: 27.6 %	Invasive Cover: 16.7 %
Plant Community: Riparian Forest		**Prevalence Index: 4.1**	**Phase: Stewardship**
Tree Diversity: 3	Shrub Diversity: 6	Herbaceous Diversity: 0	Vegetative Shade: 84.3 %
Stems per Acre: 7,333	Woody Cover: 250.0 %	Herbaceous Cover: 5.0 %	Invasive Cover: 4.0 %
Plant Community: Scrub-Shrub		**Prevalence Index: 2.1**	**Phase: Implementation**
Tree Diversity: 1	Shrub Diversity: 2	Herbaceous Diversity: 1	Vegetative Shade: 28.4 %
Stems per Acre: 1,564	Woody Cover: 49.6 %	Herbaceous Cover: 75.8 %	Invasive Cover: 5.3 %

n=30, 1/100th acre plots

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Summary

- Process initiation
- Study and review
- Front load treatments
- Push your boundaries
- Maximize treatment effectiveness

Summary

- Anticipate disturbance
- Efficient contractor utilization
- High density and diversity
- Lessons learned
- Partners
- Scalable

References

- Guillozet, P., K. Smith and K. Guillozet. 2014. The rapid riparian revegetation approach. *Ecological Restoration* 32:2
- Pollock, M., T. Beechie, J. Wheaton, C. Jordan, N. Bouwes, N. Weber and C. Volk. 2014. Using beaver dams to restore incised stream ecosystems. *BioScience* 64:4
- Weed Control in Natural Areas in the Western United States (UC Davis, 2013)
  - (http://www.cal-ipc.org/resources/booksandcds/weedcontrol.php)

Questions?

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