

Overview of the Lower Columbia River Reed Canarygrass Macroinvertebrate and Macrodetritus Production Study

Science Work Group
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Introduction

- Emergent marshes are productive and provide benefits to aquatic biota
 - Habitat for juvenile salmonids and their prey
 - Food sources and structure for macroinvertebrates
 - Macrodetritus to downstream areas
- Invasive aquatic species decrease diversity and affect food webs



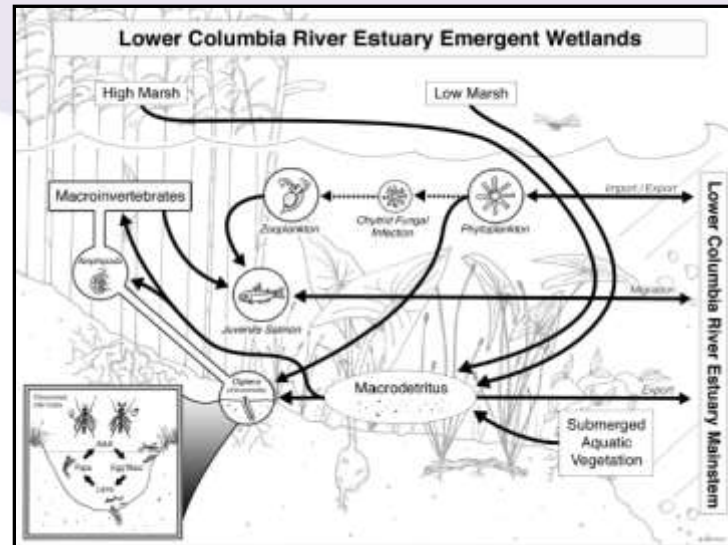
Reed Canarygrass

- Reed canarygrass (*Phalaris arudinacea*, PHAR) widespread in lower river
- PHAR dominance in tidal-freshwater habitats
 - 2014: 9% - 48% cover across lower river (mean = 20%)
- Reduced detrital input from PHAR compared to native Lyngbye's sedge (*Carex lyngbyei*, CALY)
 - PHAR = 291 g/m² vs. CALY = 1021 g/m²



Salmon Prey

- Juvenile Chinook consume variety of prey items (e.g., crustaceans, true bugs, caddisflies)
 - High preference for Diptera (family Chironomidae)
- Macroinvertebrates rely on vegetative matter for refuge and as a food source
- Production, supply, and retention of macrodetritus are important for supporting the aquatic food web



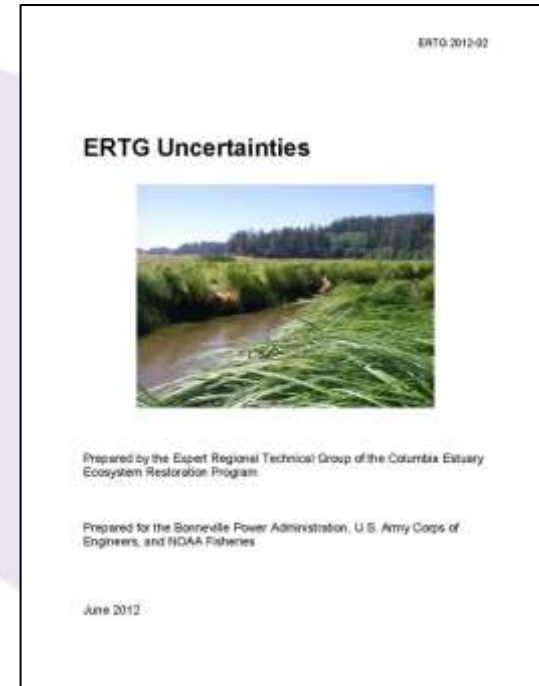
Study Question

Expert Regional Technical Group (ERTG) Uncertainty

“What are the effects of aquatic invasive species on food webs supporting juvenile salmon?”

Specifically,

- 1) Are there differences in the macroinvertebrate community structure or availability of salmon prey in PHAR vs CALY dominated habitats?
- 2) Does the supply, quality, or retention of macrodetritus differ between PHAR and CALY?

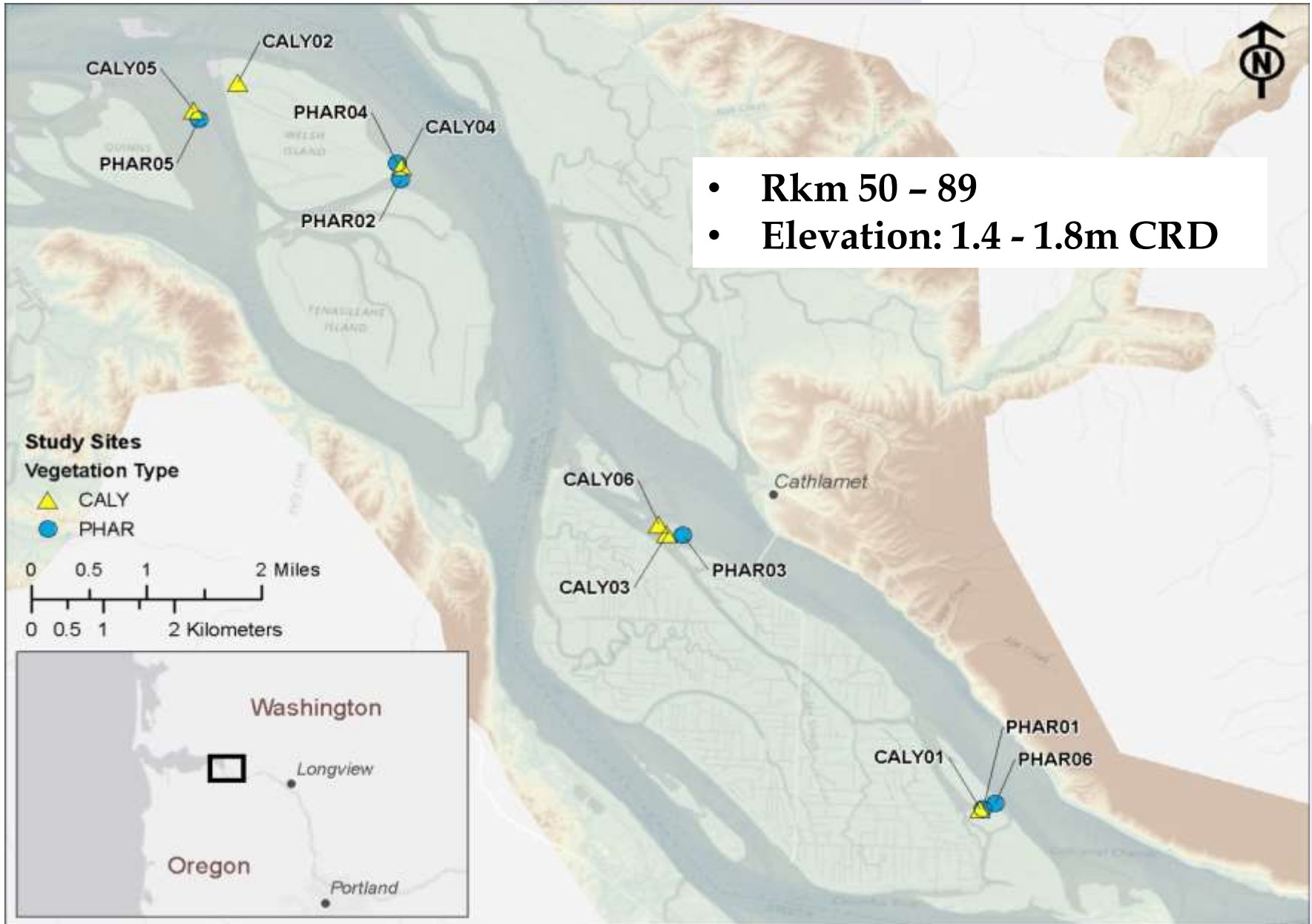


Hypotheses

- 1) There is no difference in macroinvertebrate (i.e., important salmon prey) density, biomass, and community between patches of PHAR and CALY.
- 2) The production and quality of available macrodetritus decreases with increasing percent cover of PHAR.
- 3) Decomposition rates and detritus quality of PHAR are lower than that of CALY over the juvenile salmon migration period.
- 4) Macrodetritus contribution is lower in areas of higher percent cover of PHAR.



Study Area



Methods

Timing:

April, May, June 2014

Metrics:

Vegetation and Macrodetritus

- Cover/ assemblage, detrital contribution/ quality, substrate, hydrology

Macroinvertebrates

- Biomass, density, community
- Benthic cores, emergent traps, fallout traps





Vegetation Community Structure and Macrodetritus Production

- Amy Borde, Pacific Northwest National Laboratory

Macroinvertebrate Community Structure and Availability

- Jeff Cordell and Mary Ramirez, University of Washington