

Utilization of Constructed Large Woody Debris Structures by Cottids and Juvenile Salmonids in a Coastal Western Stream

By: Shaun Korman, Katharine Scotton
and Dave Taylor

Presented by:

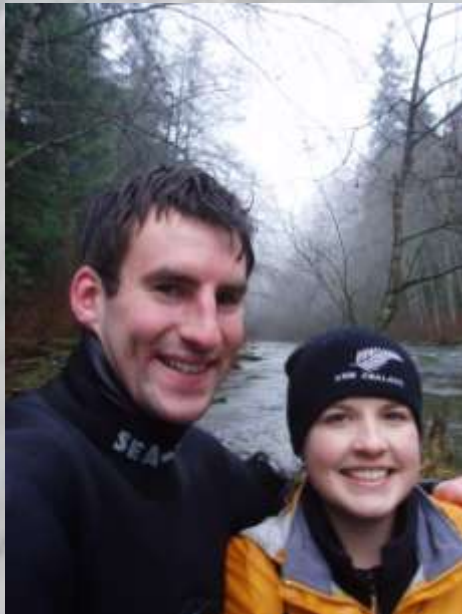
Katharine Scotton



Sponsored By

- British Columbia Ministry of Environment
- British Columbia Institute of Technology - Fish, Wildlife and Recreation Program
- Alouette River Management Society

Thank You!

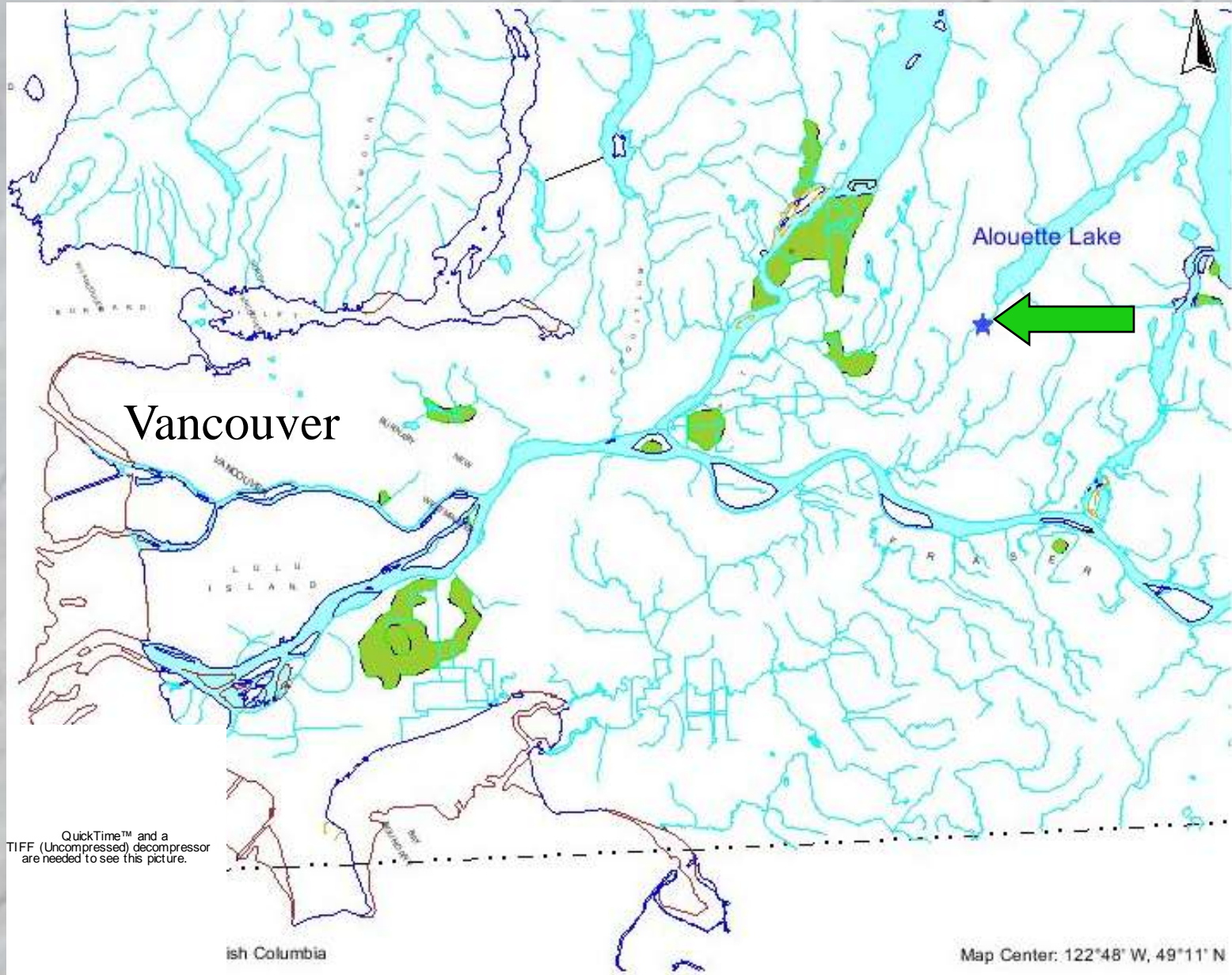


Outline

- Study Area
- LWD on the South Alouette River
- Objectives
- Fish Species and Habitat Associations
- Sampling Design
- Findings and Implications
 - Juvenile Coho
 - Sculpin
 - Juvenile Steelhead
- Management Considerations

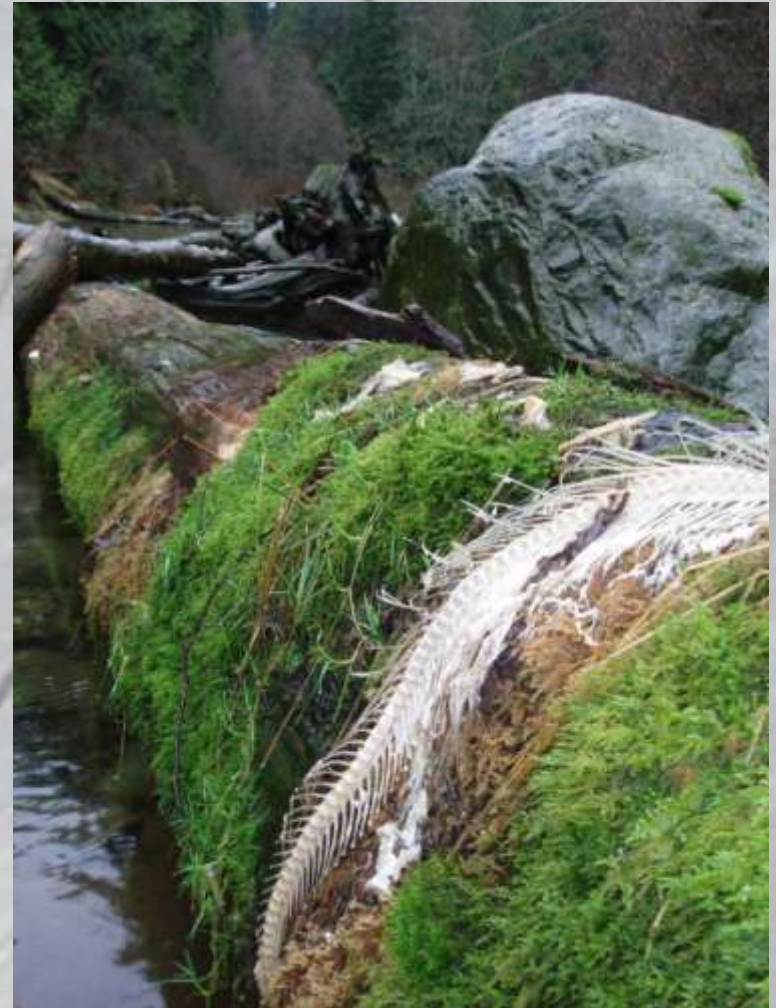


Study Site



Importance of LWD

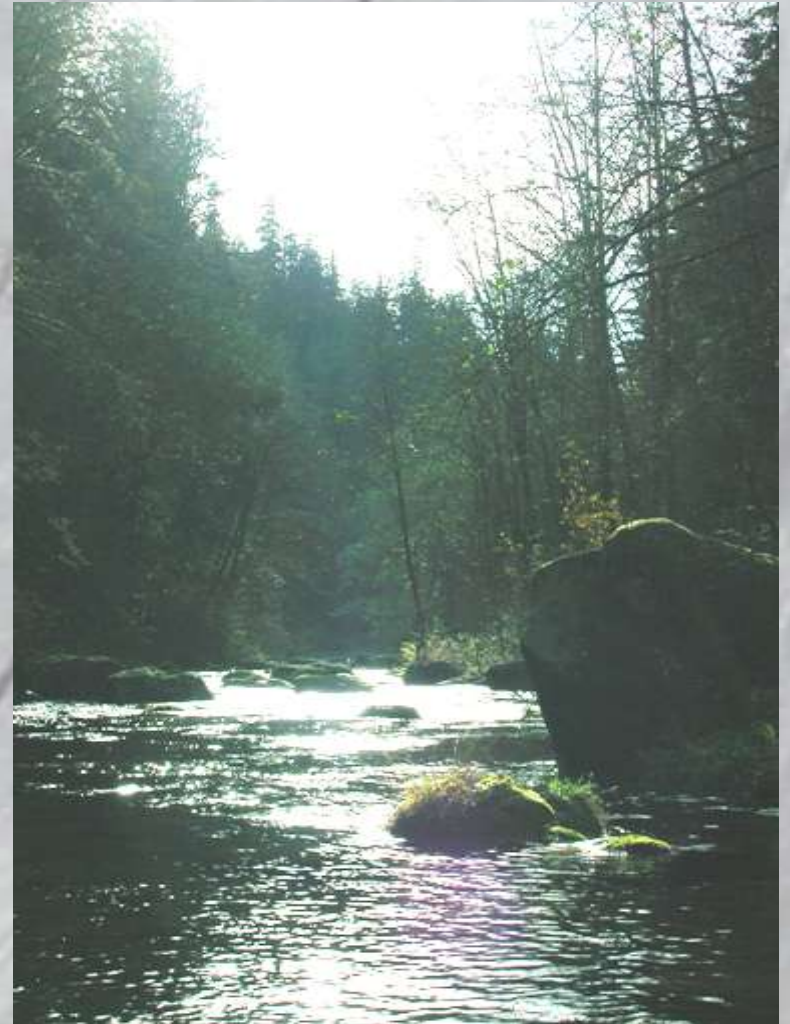
- Integral in shaping channel morphology
- Critical habitat for many fish species
- Important role in nutrient retention



South Alouette River

LWD abundance is depressed because of:

- Damming
- Logging
- Urbanization
- Past management practices



LWD restoration on the South Alouette River

- In 1997 and 1998, forty-eight instream LWD structures were placed.
- Work conducted by ARMS
 - funding from Watershed Restoration Program and the Habitat Conservation Trust Fund



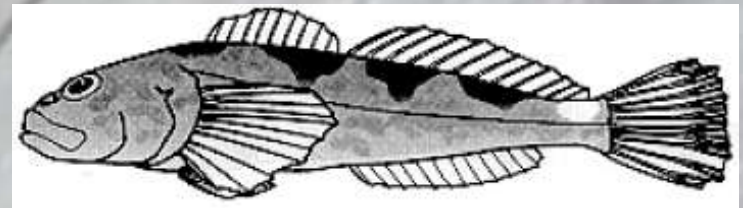
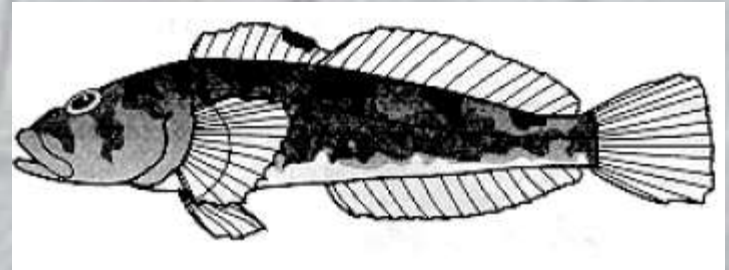
Objectives

- Assess fish utilization of constructed triangular LWD structures on the South Alouette River
- Determine fish utilization of four habitat types: *riffle with LWD, riffle without LWD, pool with LWD and pool without LWD*
- Investigate the influence of water velocity and water depth on the distribution of fish

Fish Species and Habitat Associations

Sculpins

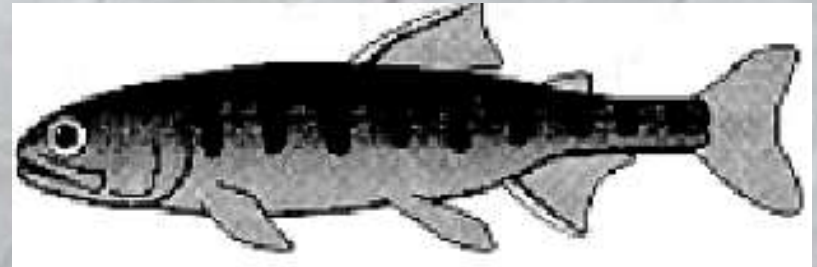
- Possibly two morphologically similar species are found here
 1. Prickly Sculpin
 - Pools
 2. Coastrange Sculpin
 - Riffles



Fish Species and Habitat Associations

Juvenile Coho

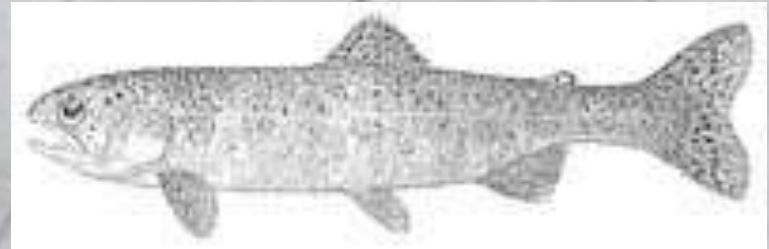
- Strong correlation with a number of cover types
- Utilize slow moving pools
 - Water depths between 46-120 cm (18-47 in) and velocities < 20 cm/s (7.9 in/s)



Fish Species and Habitat Associations

Juvenile Steelhead

- Utilize faster moving water
 - Water depths between 10 and 50 cm (3.9-19.7 in) and velocities between 21 and 39 cm/s (8 - 15 in/s)

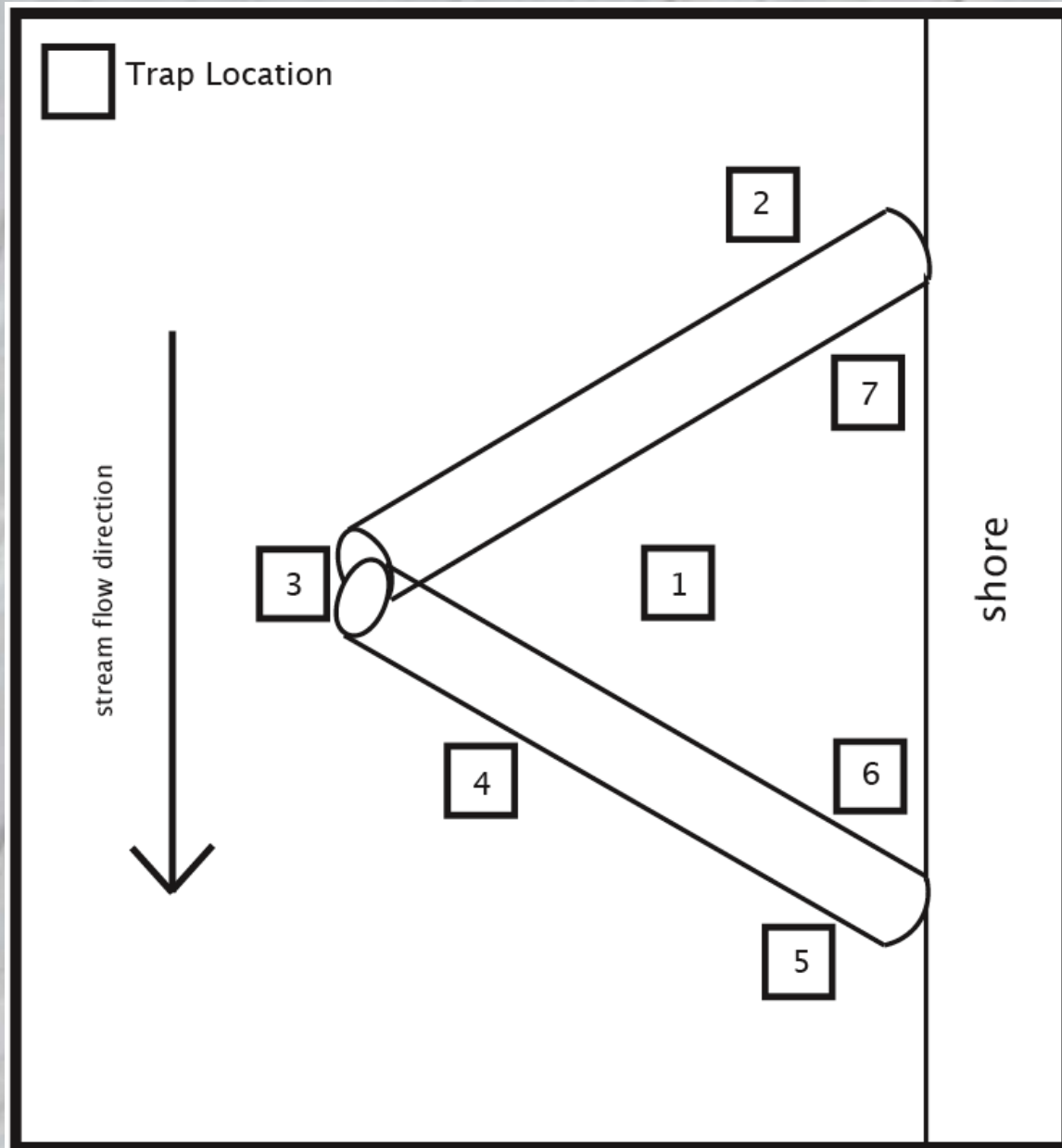


Gee Trapping

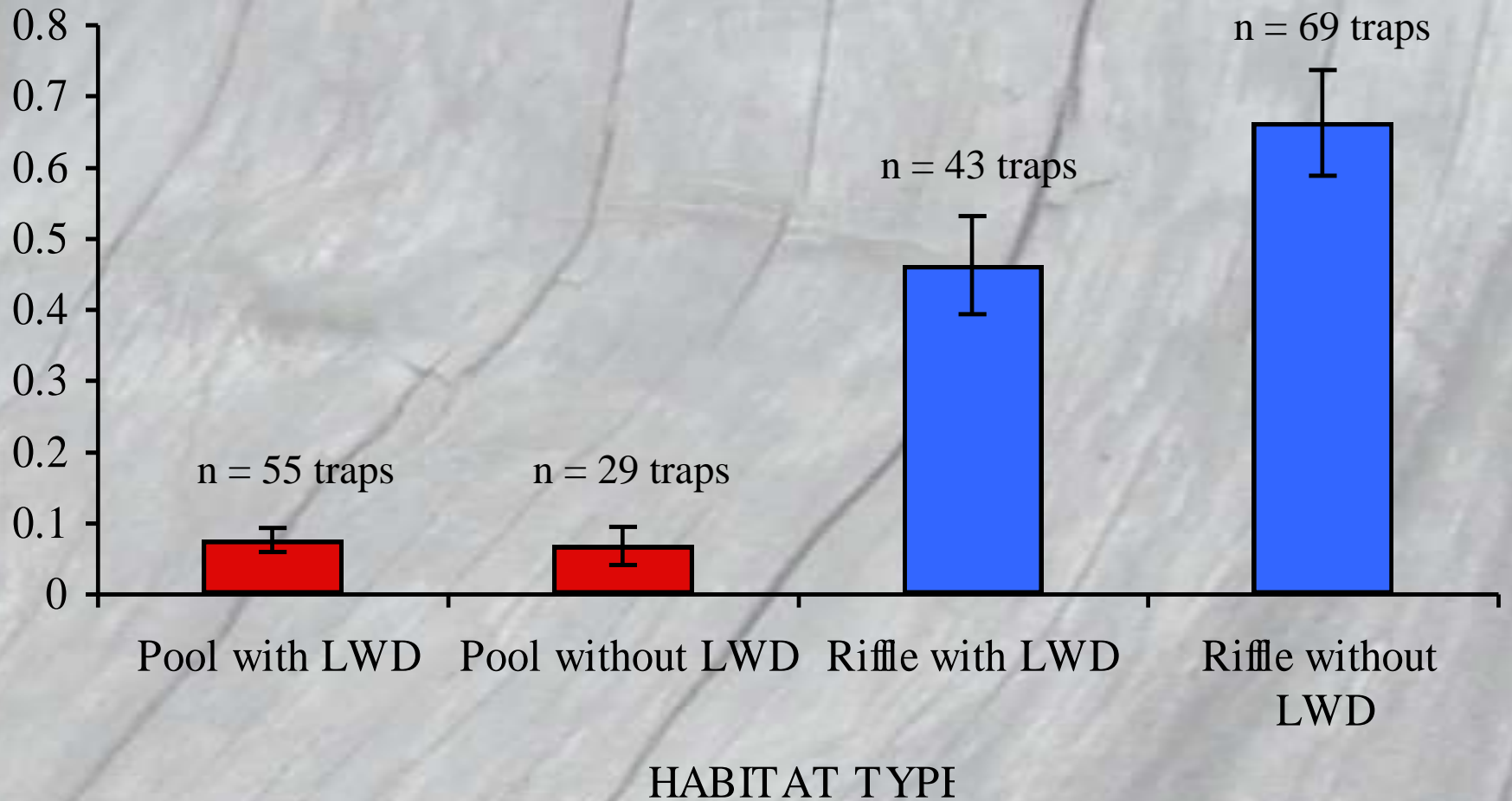
- Traps were baited with salmon roe.
- Fall trapping in LWD structures and controls.
- Winter trapping in riffles with and without LWD. Four LWD structures were also re-trapped.



Trapping Matrix



Defining Habitat Types

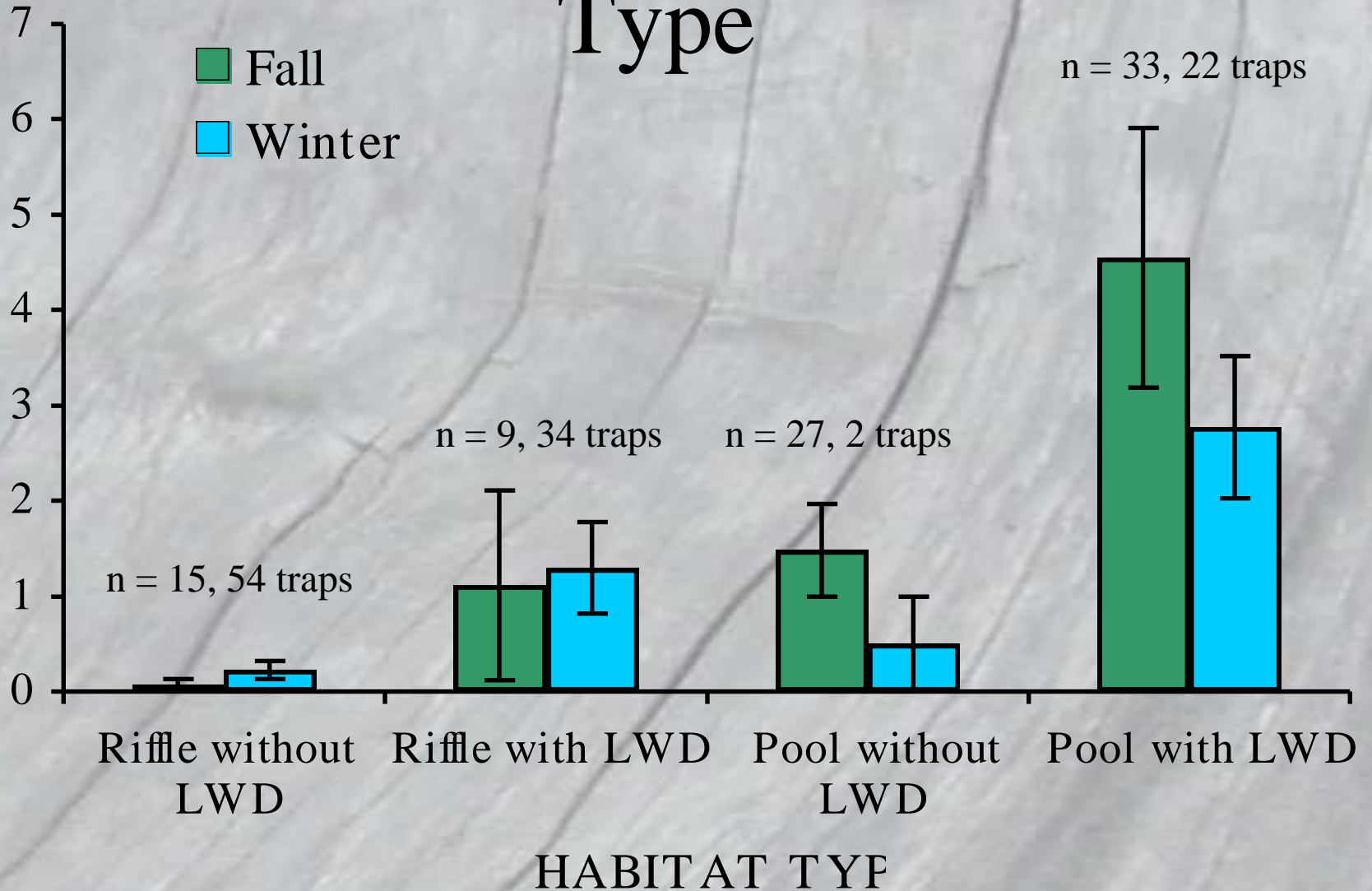




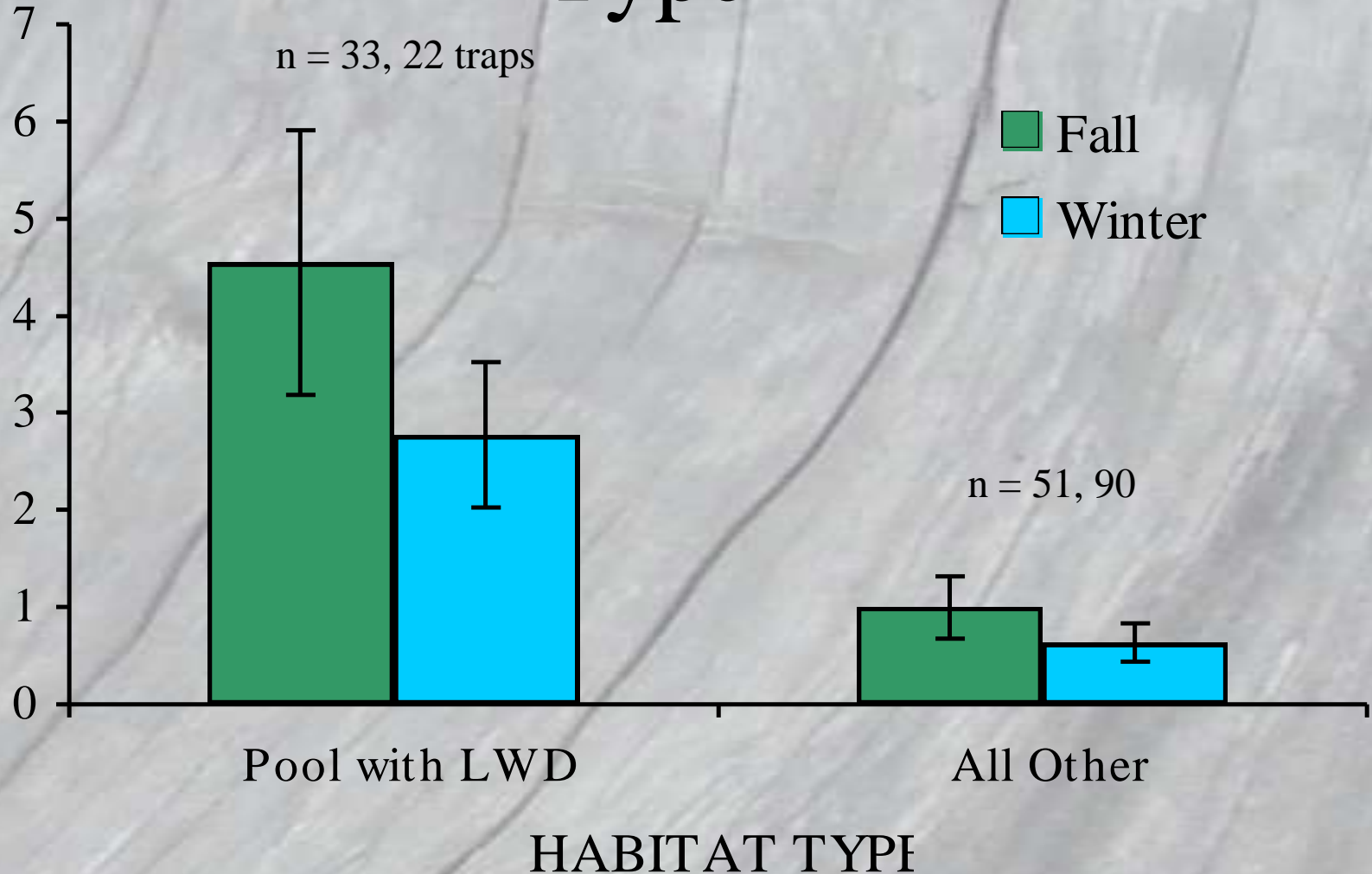
Findings and Implications

Coho Distribution by Habitat

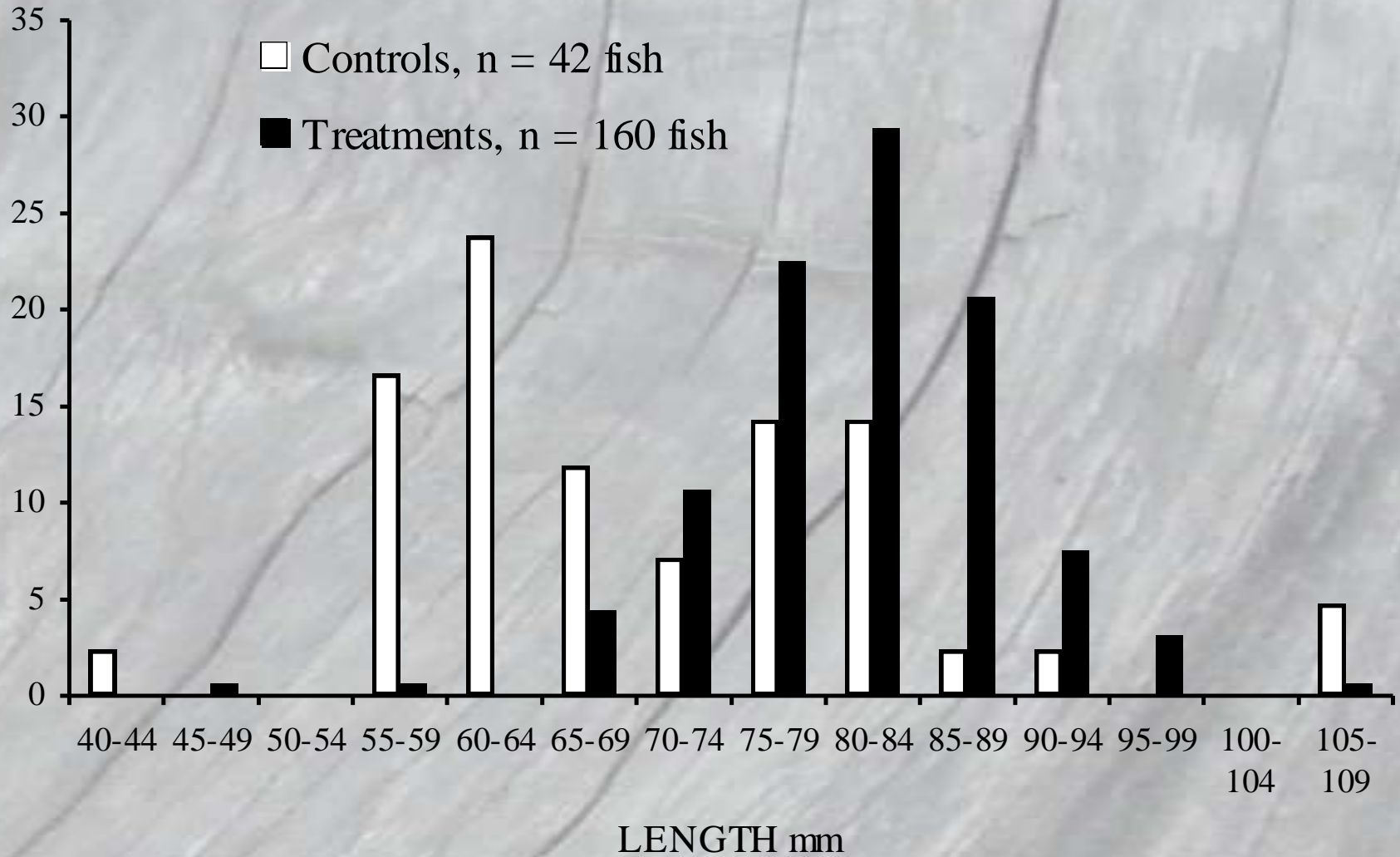
Type



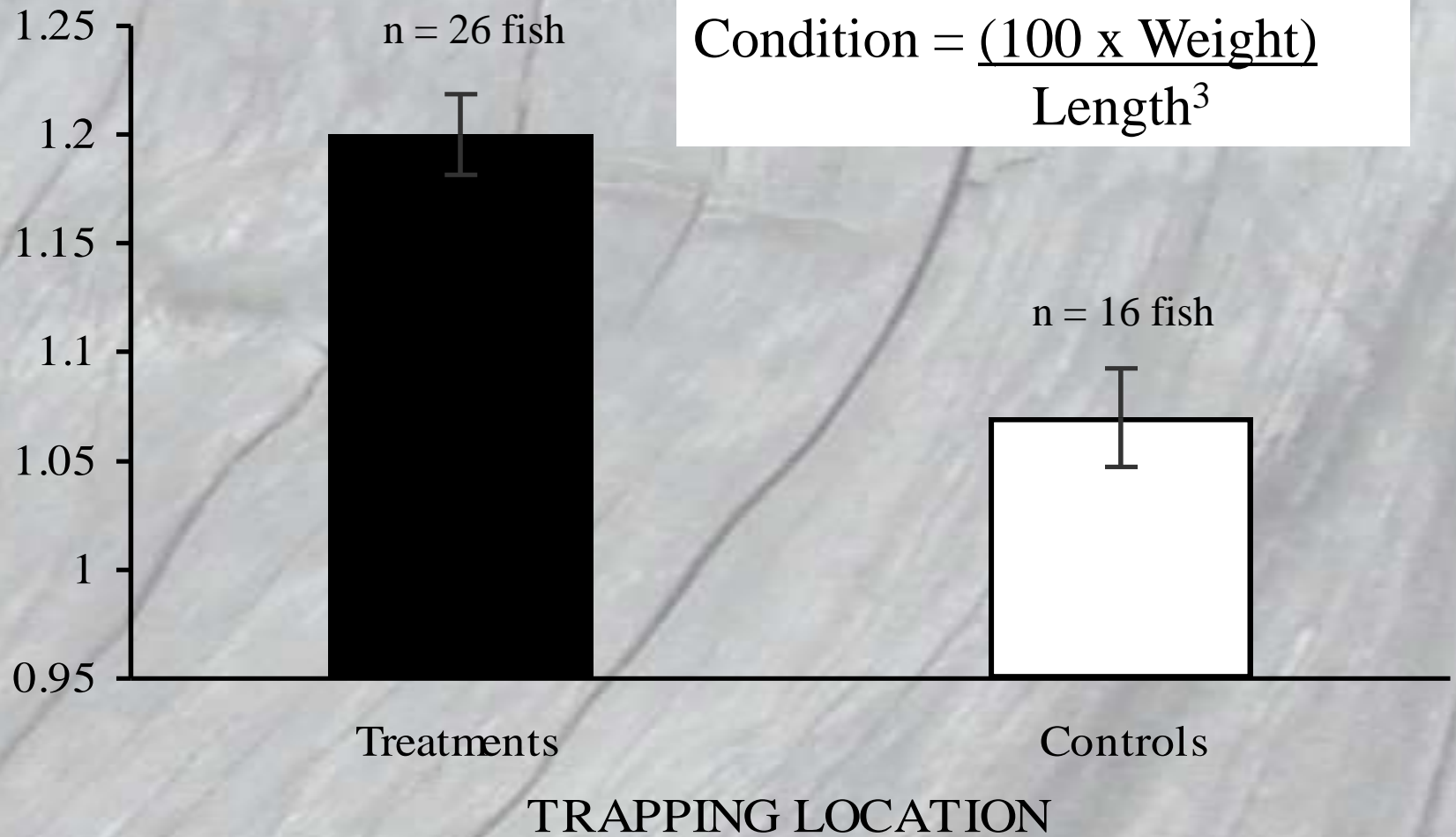
Coho Distribution by Habitat Type



Lengths of Coho



Condition of Coho

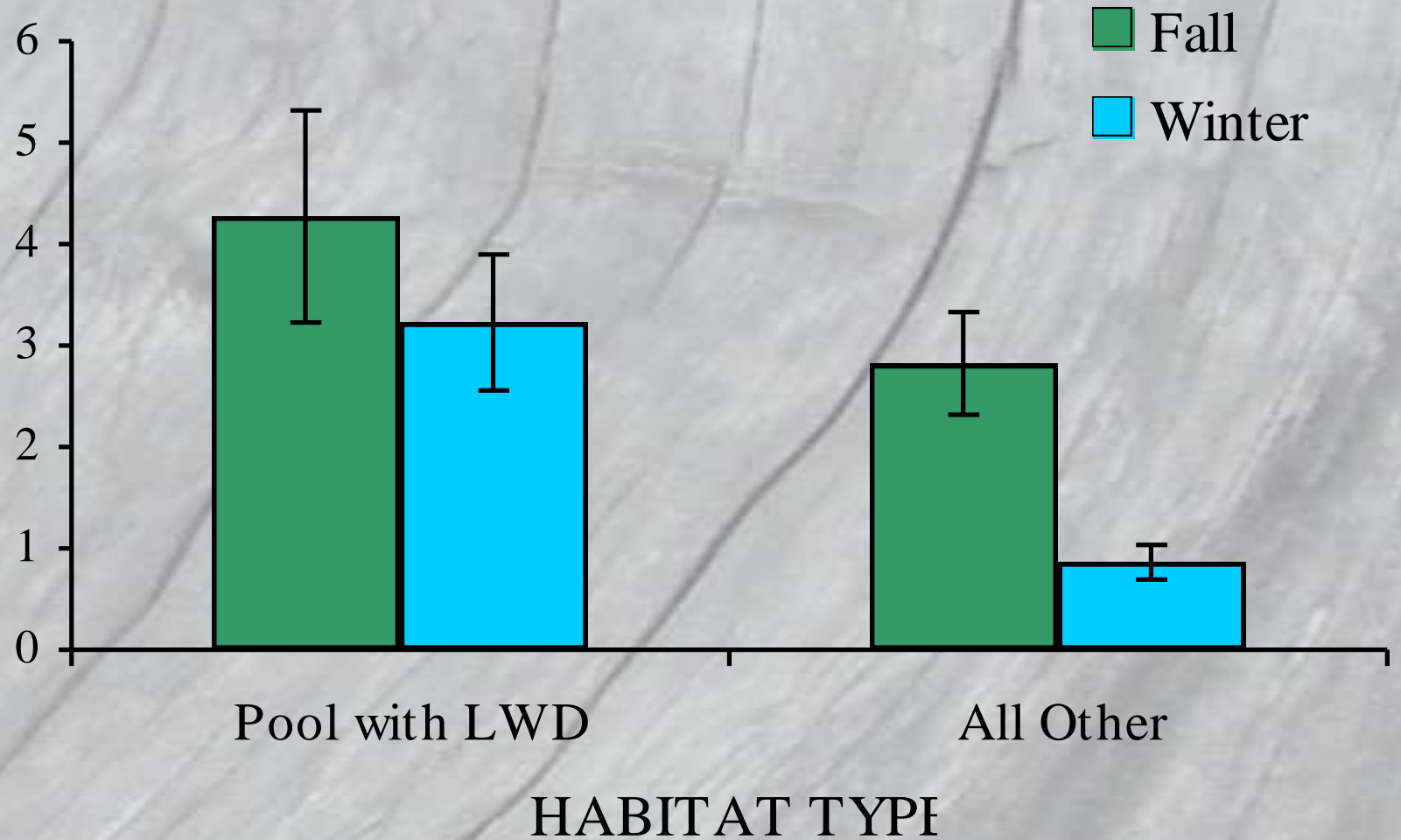




Sculpin Distribution by Habitat Type

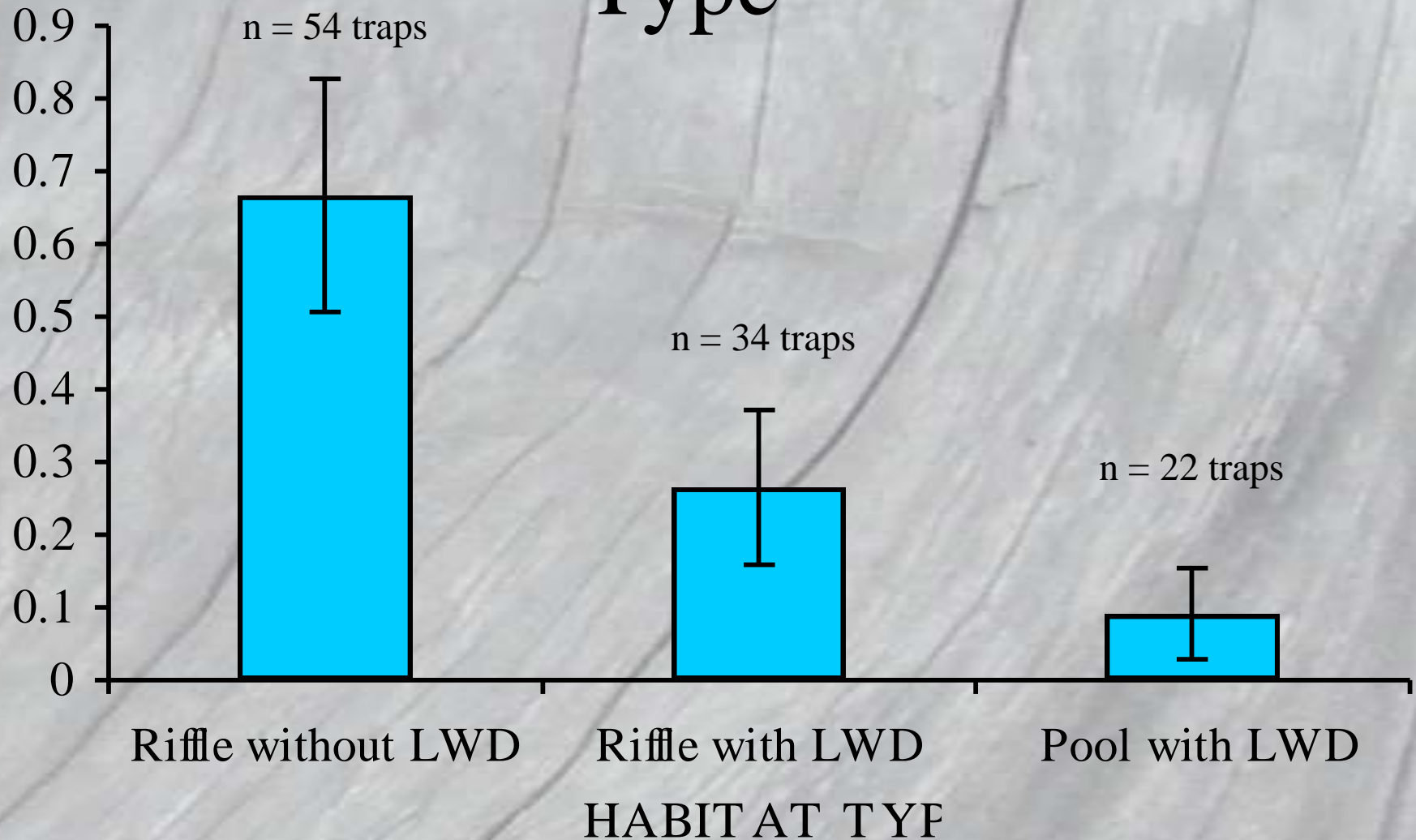


Sculpin Distribution by Habitat Type

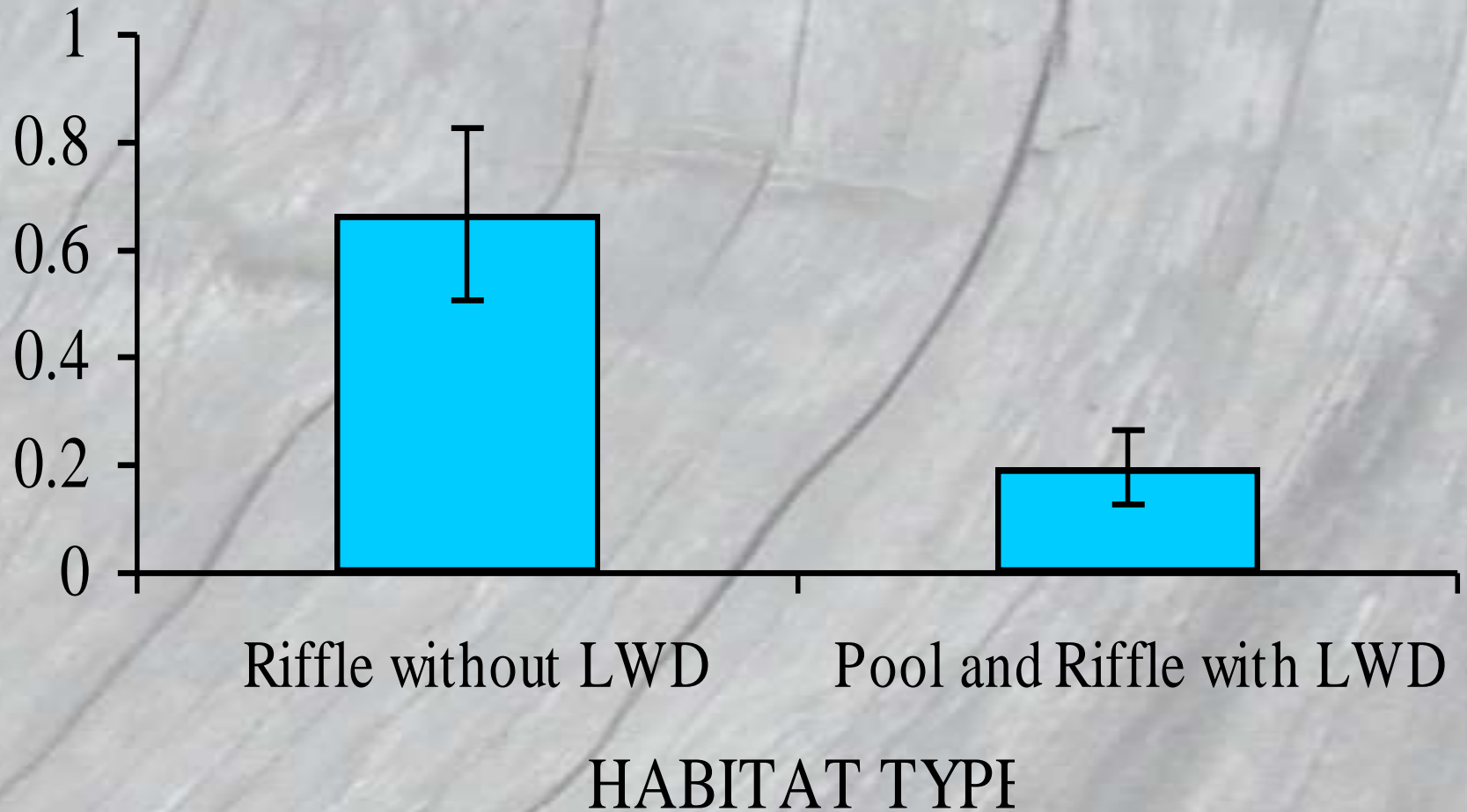




Steelhead Distribution by Habitat Type

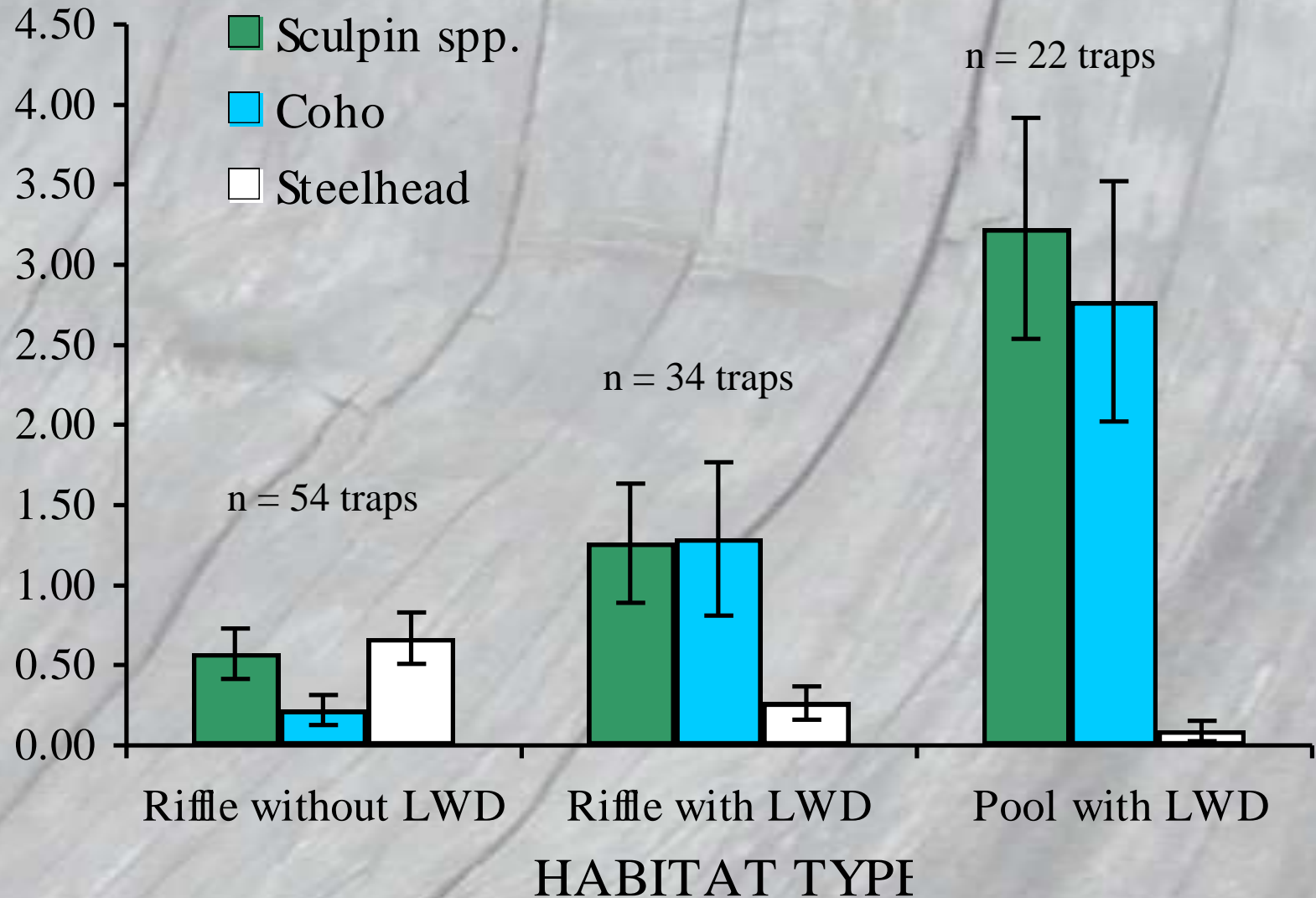


Steelhead Distribution by Habitat Type





Winter Habitat Usage: Comparison of Fish Species



Revisiting the Objectives

1. Fish utilization of LWD structures
 - Coho and sculpin are using the LWD
2. Fish utilization of four habitat types
 - Pools with and without LWD are used by coho and sculpins, with coho using pools with LWD most.
 - Riffles with LWD are used by all species moderately
 - Riffles without LWD are used by steelhead
3. Water velocity and depth related to fish distributions
 - Coho and sculpins in slower, deeper water
 - Steelhead in faster, shallow water

More to the Story

LWD's ability to change the physical aquatic habitat likely impacted species distribution within the study reach.

- sculpin and juvenile coho have a strong affinity for slow-moving water
- juvenile steelhead have a strong affinity for shallow fast moving water

Management Considerations

Restoration projects must:

- Have clear and measurable objectives
- Consider species specific habitat associations
- Be evaluated on a stream to stream basis
- Have monitoring to evaluate effectiveness.

Acknowledgements

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