

Possible prey-related consequences for chinook rearing in an urban lake



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Lake Washington

- Juvenile chinook rear in lake for up to 6 months
- Utilize the littoral zone
- Cedar River and Big Bear Creek; two hatcheries
- Human impacts on shore...



IMPACT THE LITTORAL ZONE BIOTA!

Roadmap

Chinook Prey-

Diet

Comparisons



Prey Production-

Neuston

Epibenthos



Hypotheses

Ho: Shoreline development of Lake Washington does not affect chinook diet and prey resources in the lake.

Ha: Shoreline development of Lake Washington negatively affects chinook diet and prey resources in the lake.

✦ Prey Resource Sites

✦ Beach Seine Sites



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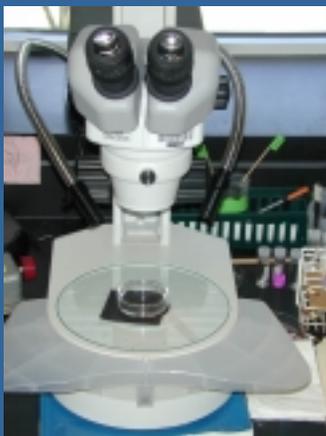


Why look at what the fish are eating in Lake Washington?

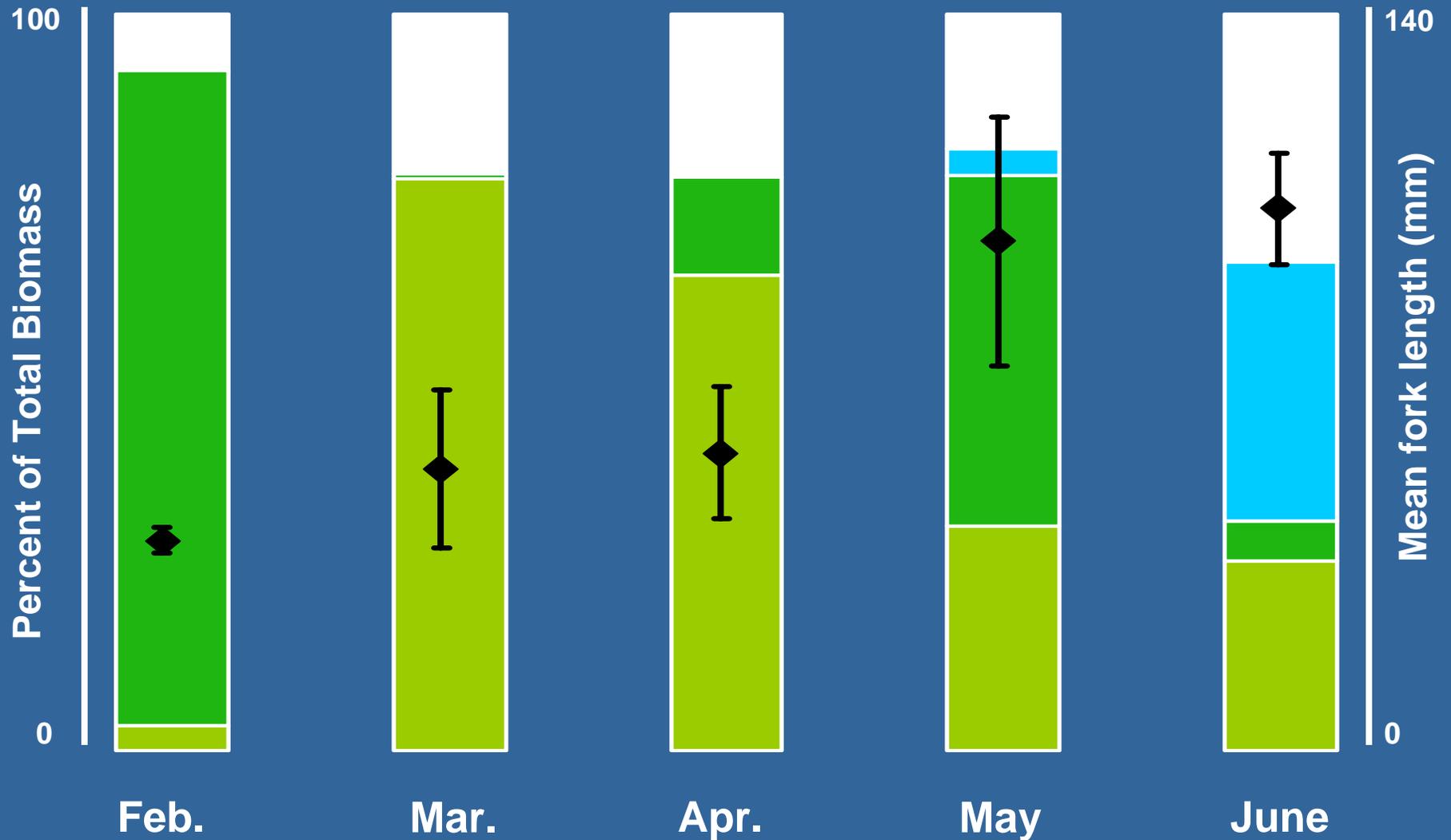


Methods

- WDFW beach seine crew
- Gastric lavage
- Contents weighed, enumerated



Chinook Diet



Zooplankton:

Daphnia, sp.

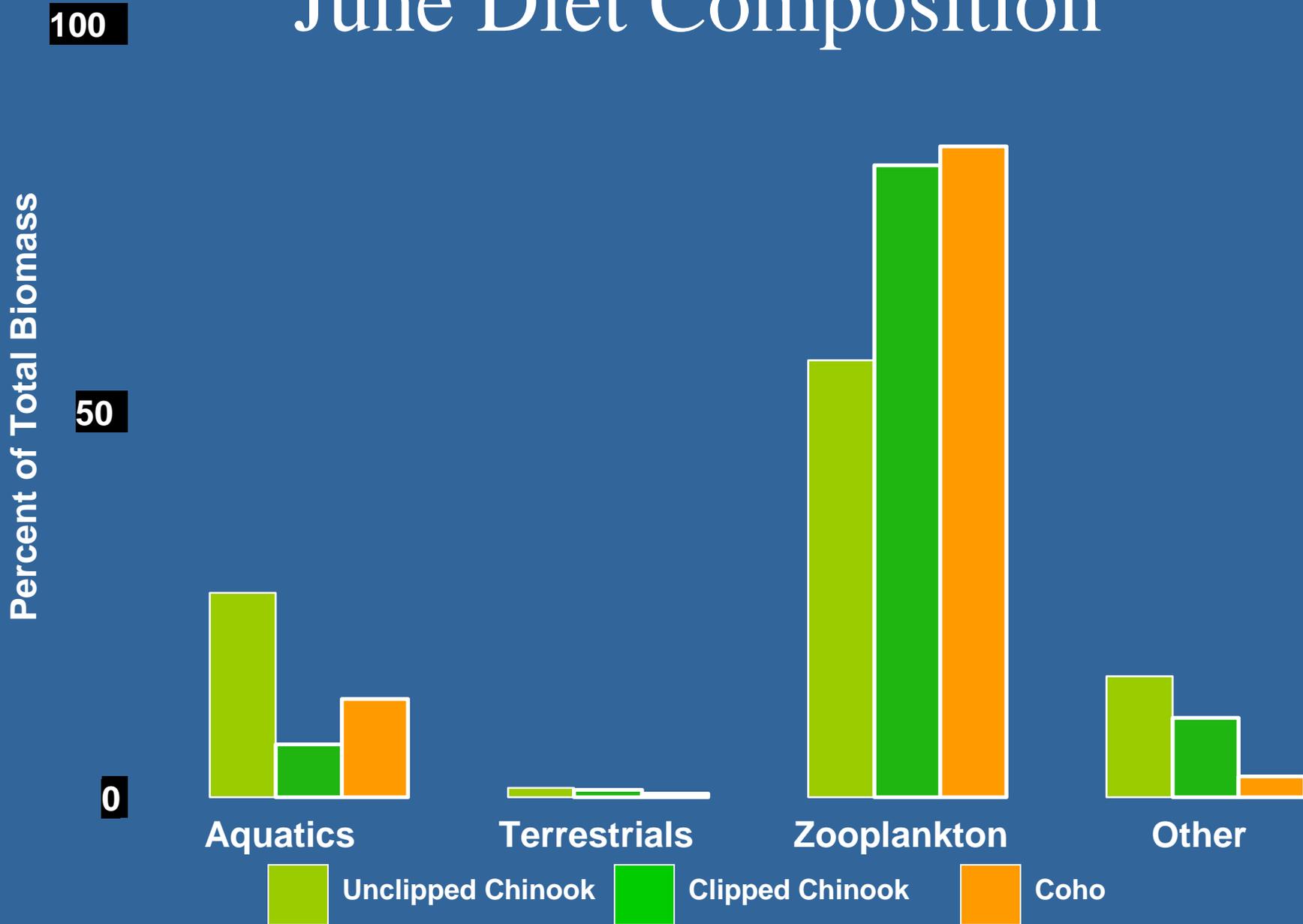
- Inhabit the water column

Terrestrial Insects:



- Insects that fall or are blown off of riparian vegetation into the lake

June Diet Composition



Findings

- Hatchery chinook take more prey from the water column, unclipped fish feed more from the surface
- Juvenile coho follow consumption patterns of hatchery chinook.
- Few terrestrial bugs are consumed by any group.

Additional Information:

- Rondorf *et al.* (1994) on Columbia River found terrestrial diet can be up to 27%; I observed 1-2%
- Selectivity indices and a bioenergetics model would also help to determine what the preference of these fish is and give consumption maximums.

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Why study juvenile chinook prey production in Lake Washington?

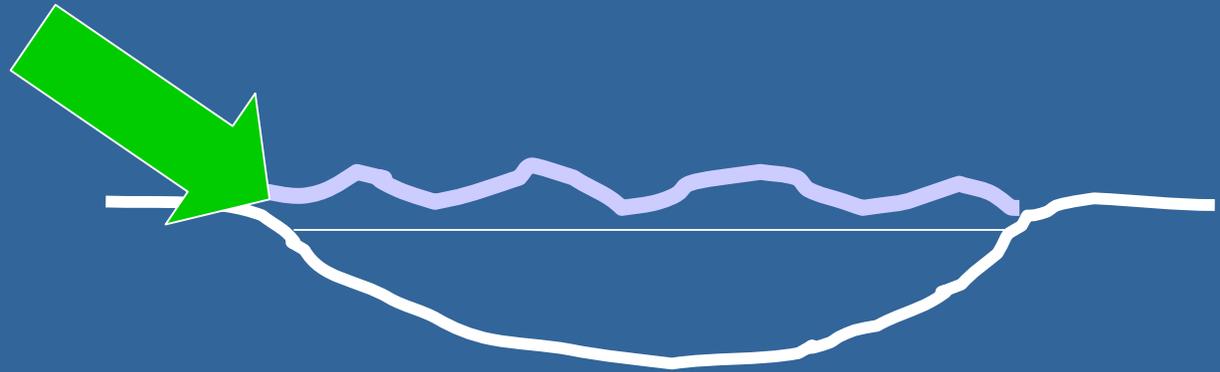


Mechanisms for reduction in prey resources:

- Removal of riparian vegetation
- Reduction in woody debris input
- Piers and docks
- Revetments redirect shoreline wave energy
- Chemical runoff from lawns and impervious areas
- Human activity



NEUSTON



FOUR SHORELINE TYPES:

Forested

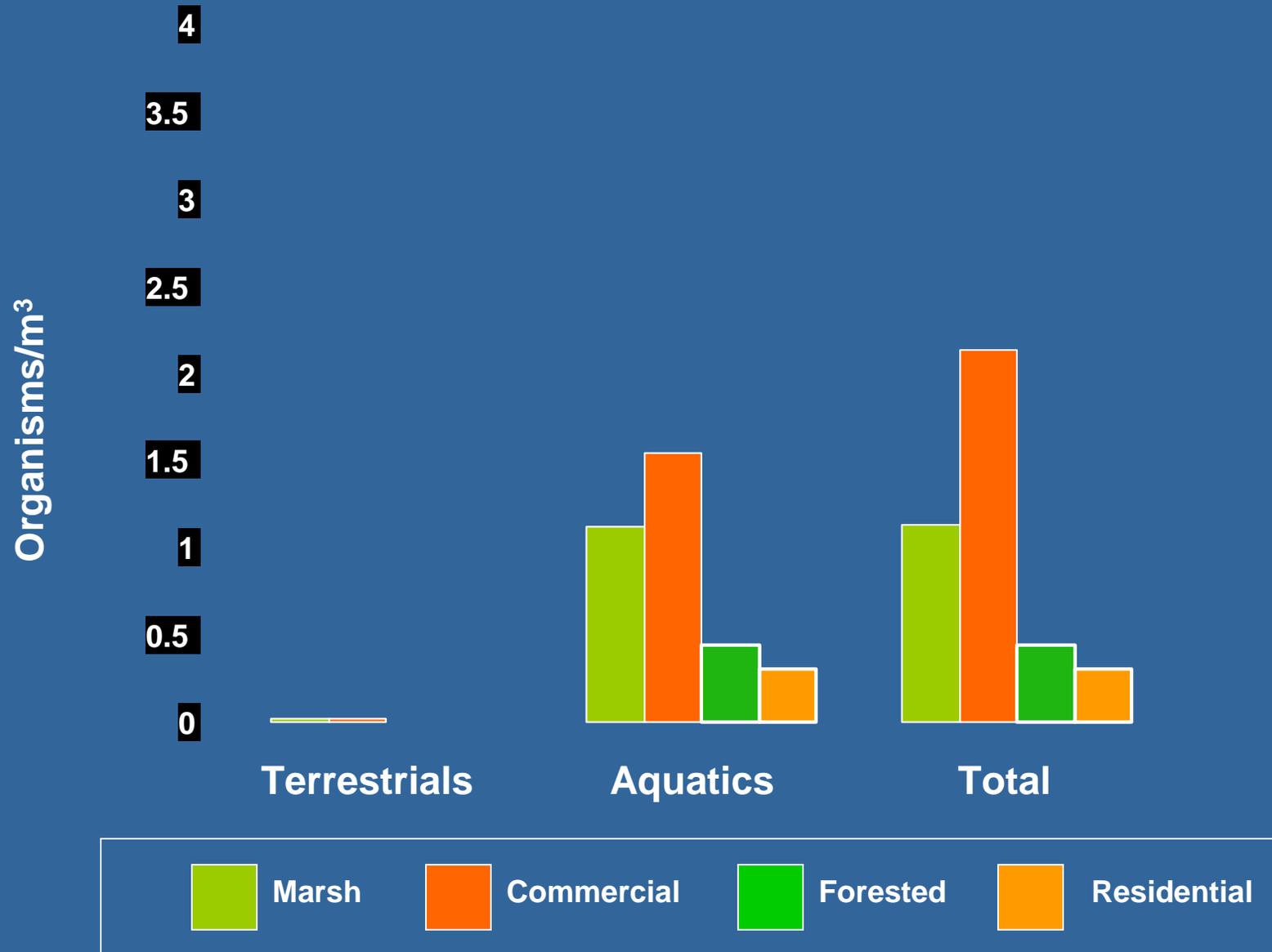
Marsh

Residential

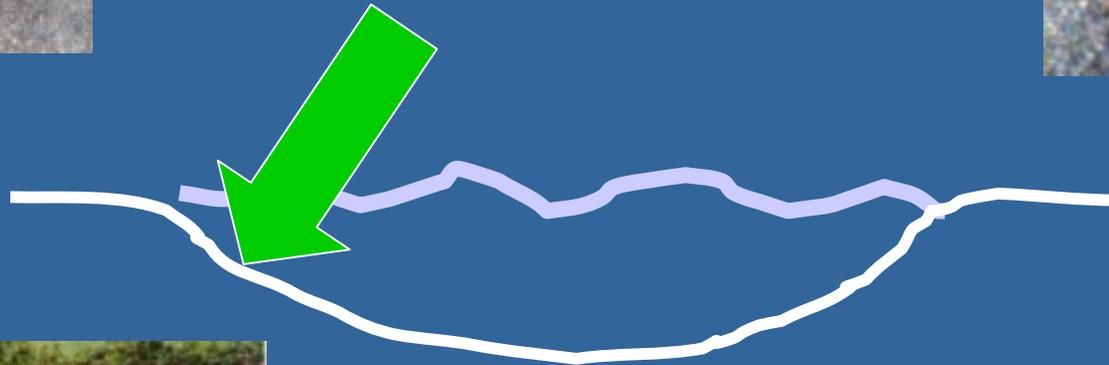
Commercial (marina)



June Neuston Densities



EPIBENTHOS



FOUR SHORELINE TYPES:

Forested, Marsh,
Residential, & Commercial (marina)

TWO SUBSTRATES:

Fine Cobble and Muck

■ Forested vs.

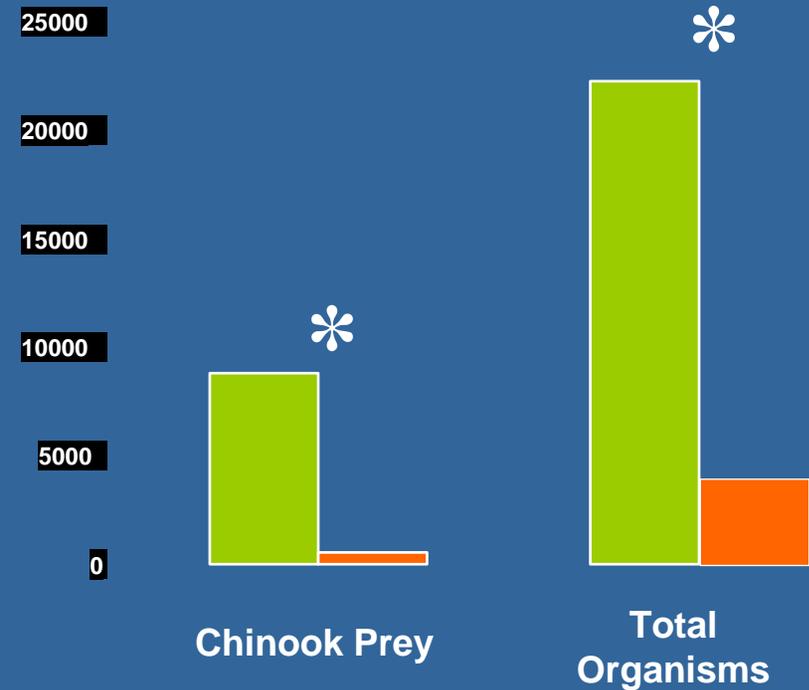
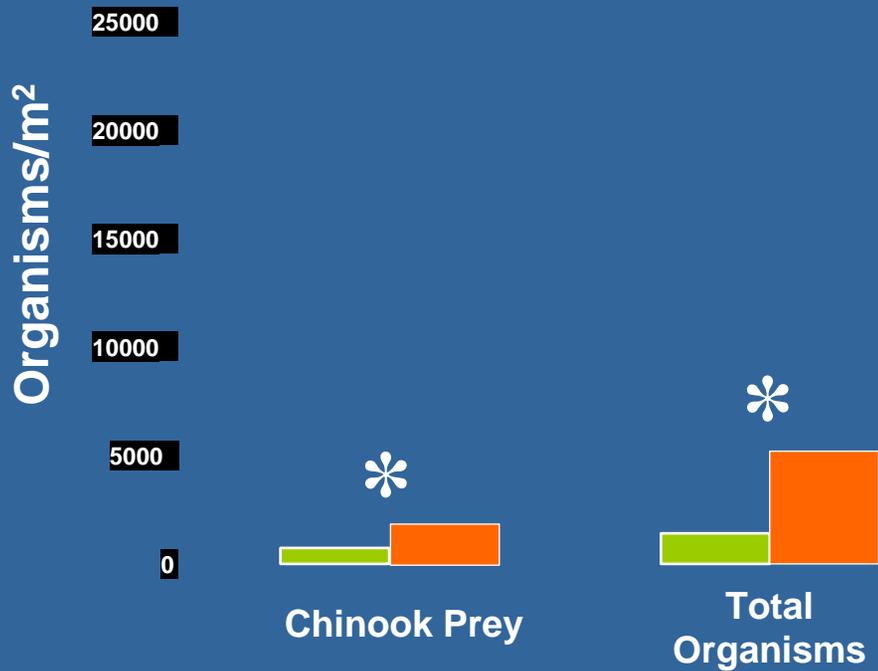
■ Residential

(Fine Cobble Epibenthos)

■ Marsh vs.

■ Commercial

(Mucky Epibenthos)



Wrap Up:

- Chironomids are important prey of chinook; in May and June Daphnia are also important
- Terrestrial insects are not consumed or found in neuston in the lake
- Chironomids are produced in highest amounts in mucky substrates with natural shorelines in the lake

Shoreline Management Implications

1. Increase riparian zone vegetation to provide adequate terrestrial input
2. Work to prevent development of current natural areas and restore historical shoreline types



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