Selenium Concentrations in Fish & Zooplankton in Lake Mead

Tim Ricks

Southern Nevada Water Authority

January 9-10, 2013

Las Vegas Wash Coordination Committee

www.lvwash.org

Acknowledgements

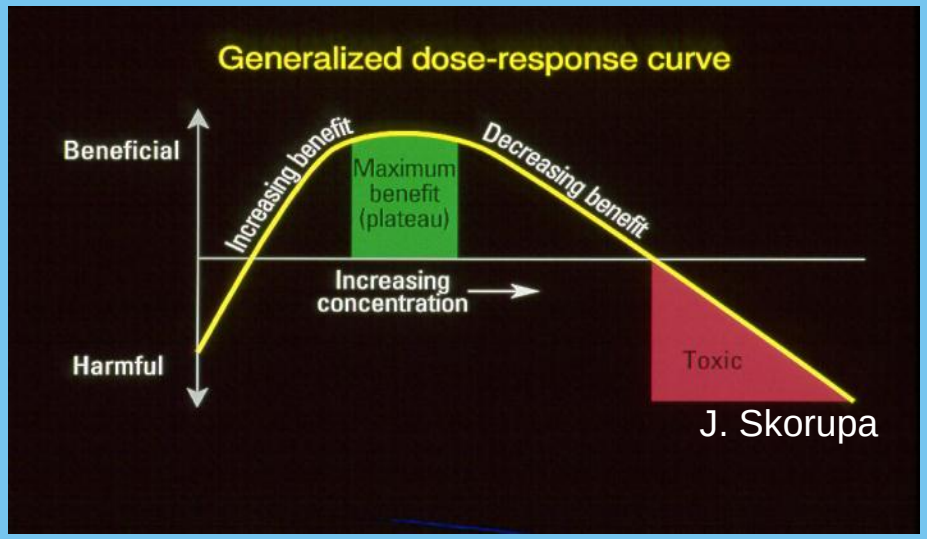
- Las Vegas Wash Coordination Committee
- Bureau of Reclamation
- City of Las Vegas
- Nevada Dept of Wildlife
- Bio-West, Inc.

Las Vegas Wash Coordination Committee

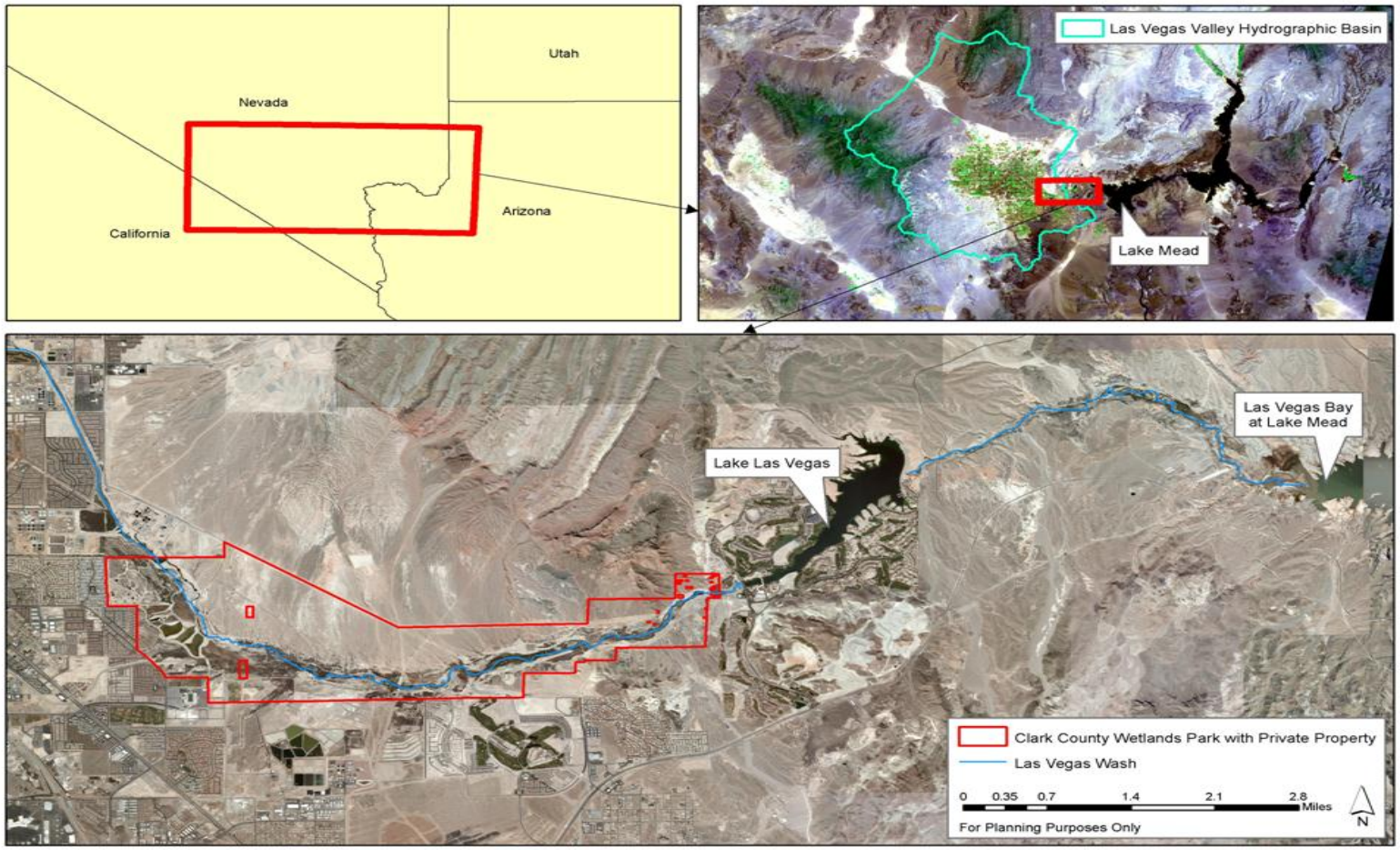
www.lvwash.org

Background-Selenium

- Inorganic that occurs naturally in soil
- Leaches easily
- Is essential for bodily function in small quantities
- Toxic effects in larger quantities



Las Vegas Valley Watershed

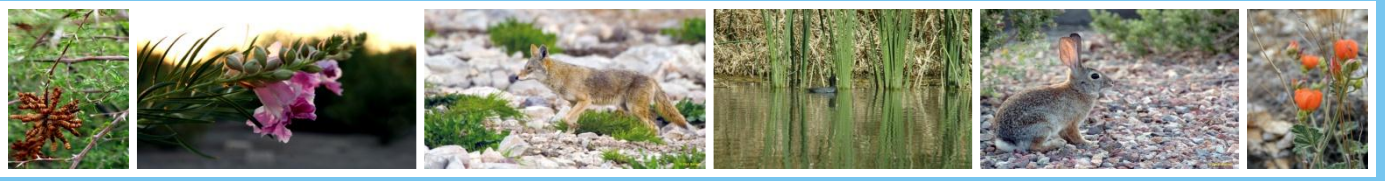


Las Vegas Wash Coordination Committee

www.lvwash.org

Wash Stabilization Effort

- First weir installed in 2000
- 15 of 22 planned weirs completed
- TSS have decreased by > 60%
- Can create potential contaminant sink

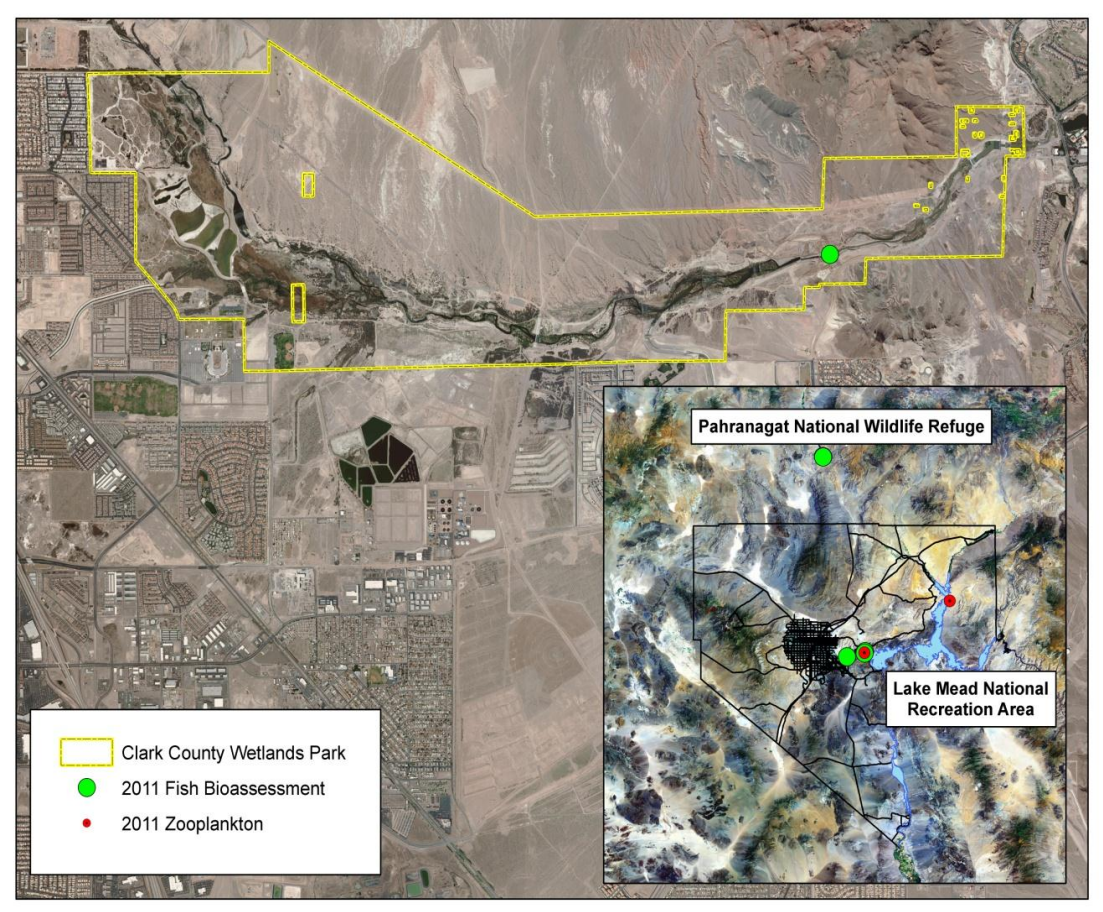


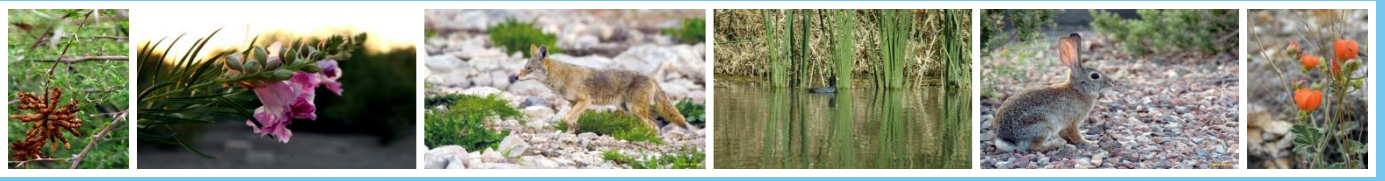
Las Vegas Wash Coordination Committee

www.lvwash.org

Fish Collections

- Fish Collected in: 2003, 2005, 2007, & 2011
- Three locations
  - Las Vegas Wash
  - Las Vegas Bay
  - Pahranagat National Wildlife Refuge

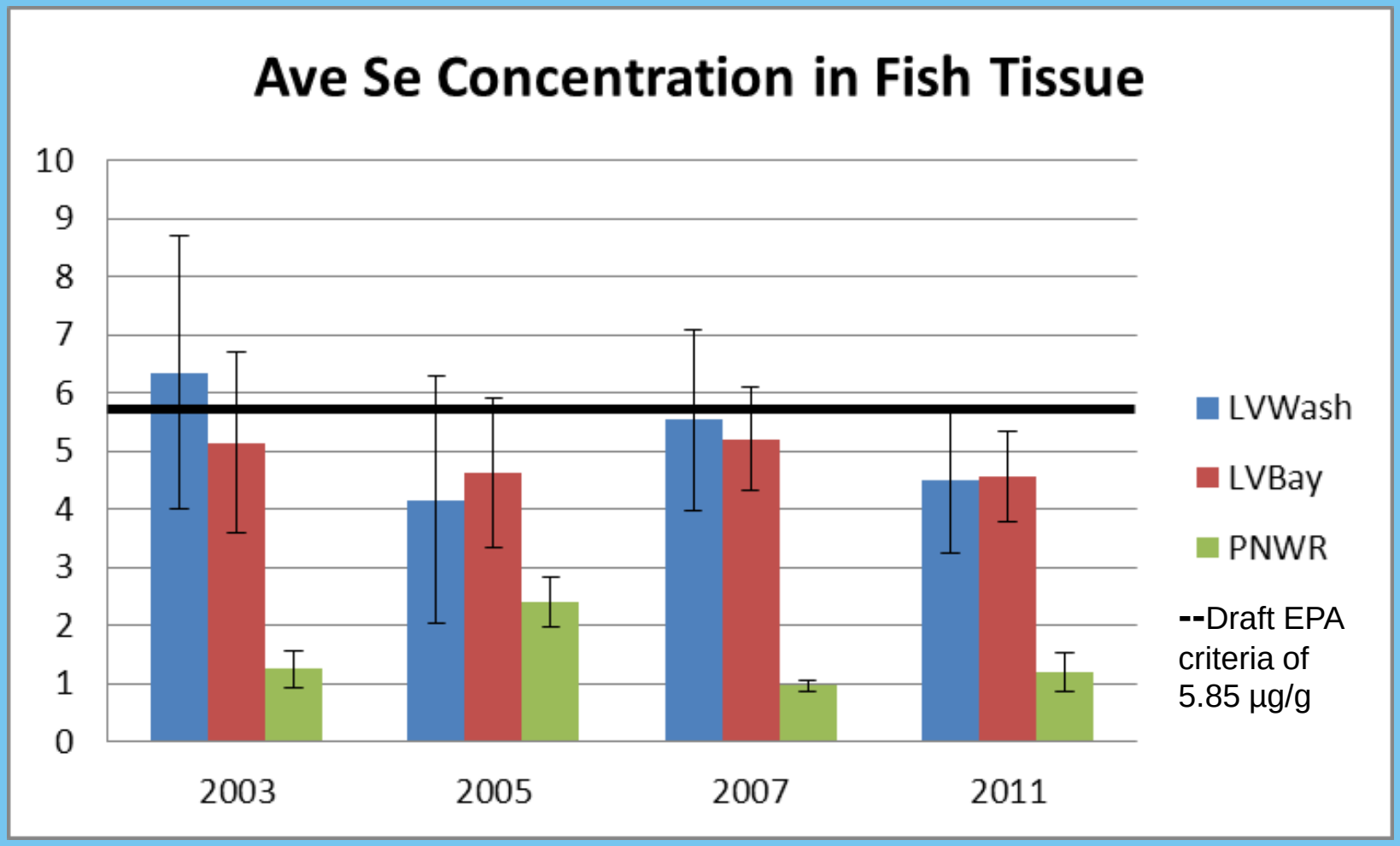




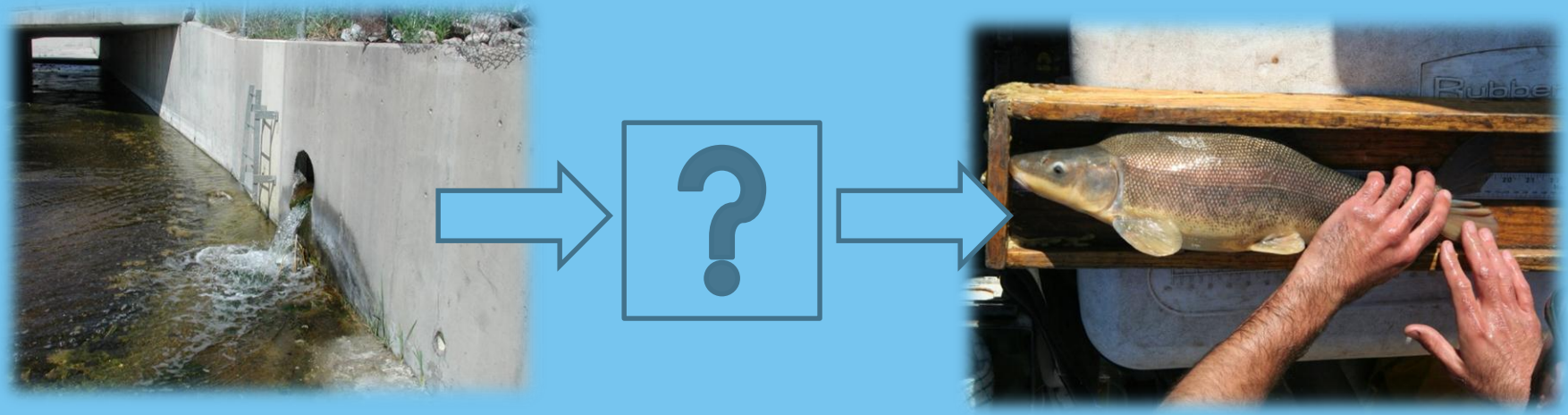
Las Vegas Wash Coordination Committee

www.lvwash.org

Carp Tissue Selenium Results



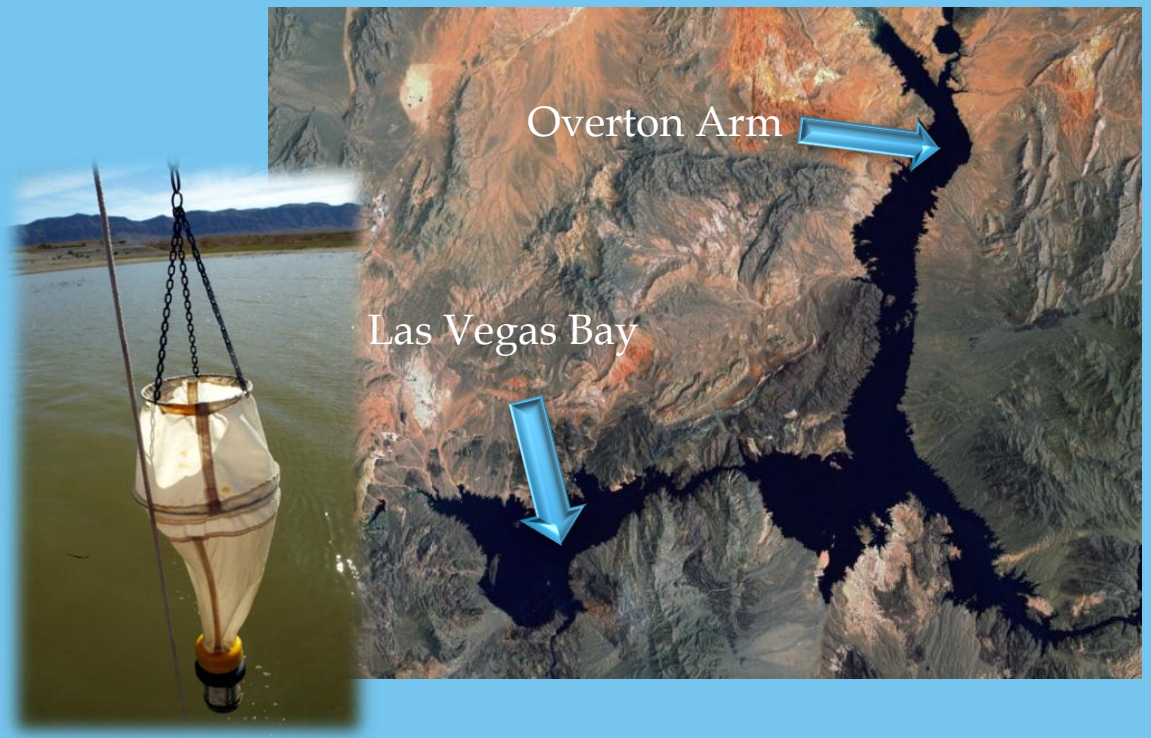
Zooplankton Study



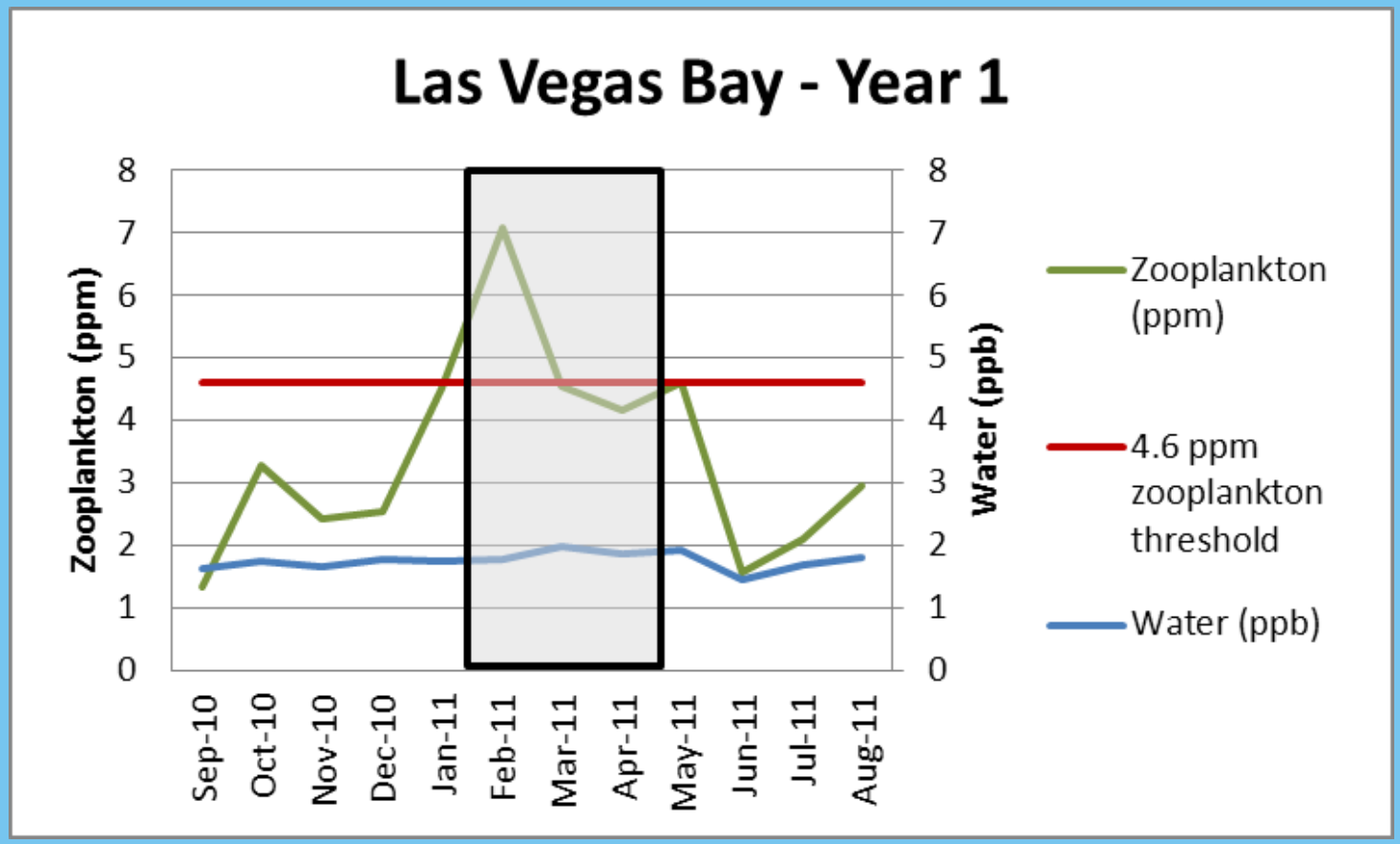
Hamilton, et al. 2004 targeted larval stage as most at risk from Se exposure

Methods

- Monthly collections/24 months
- Spawning Sites
  - Las Vegas Bay
  - Overton Arm
- Horizontal tows
- Wholesale plankton sample



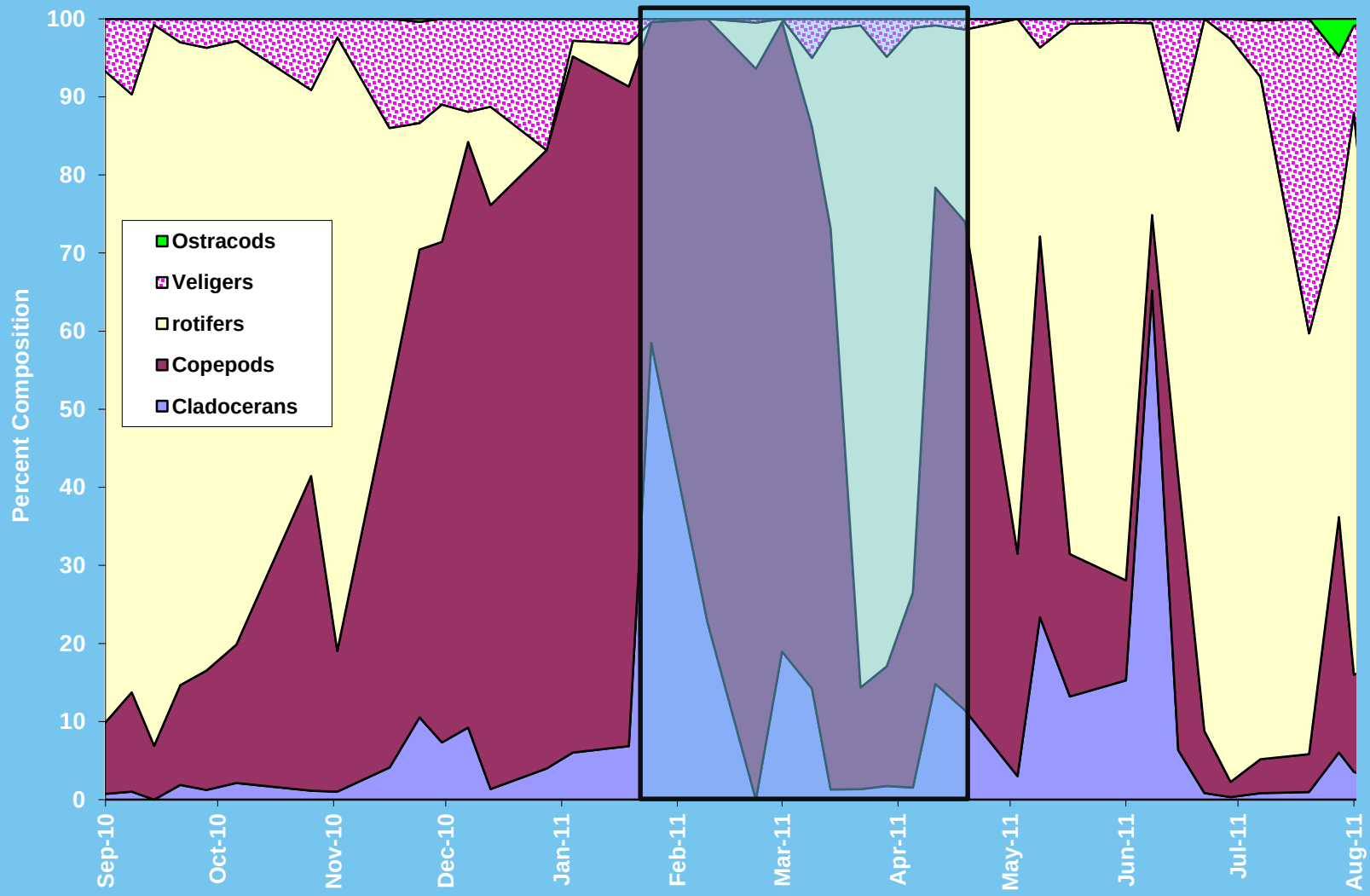
Results



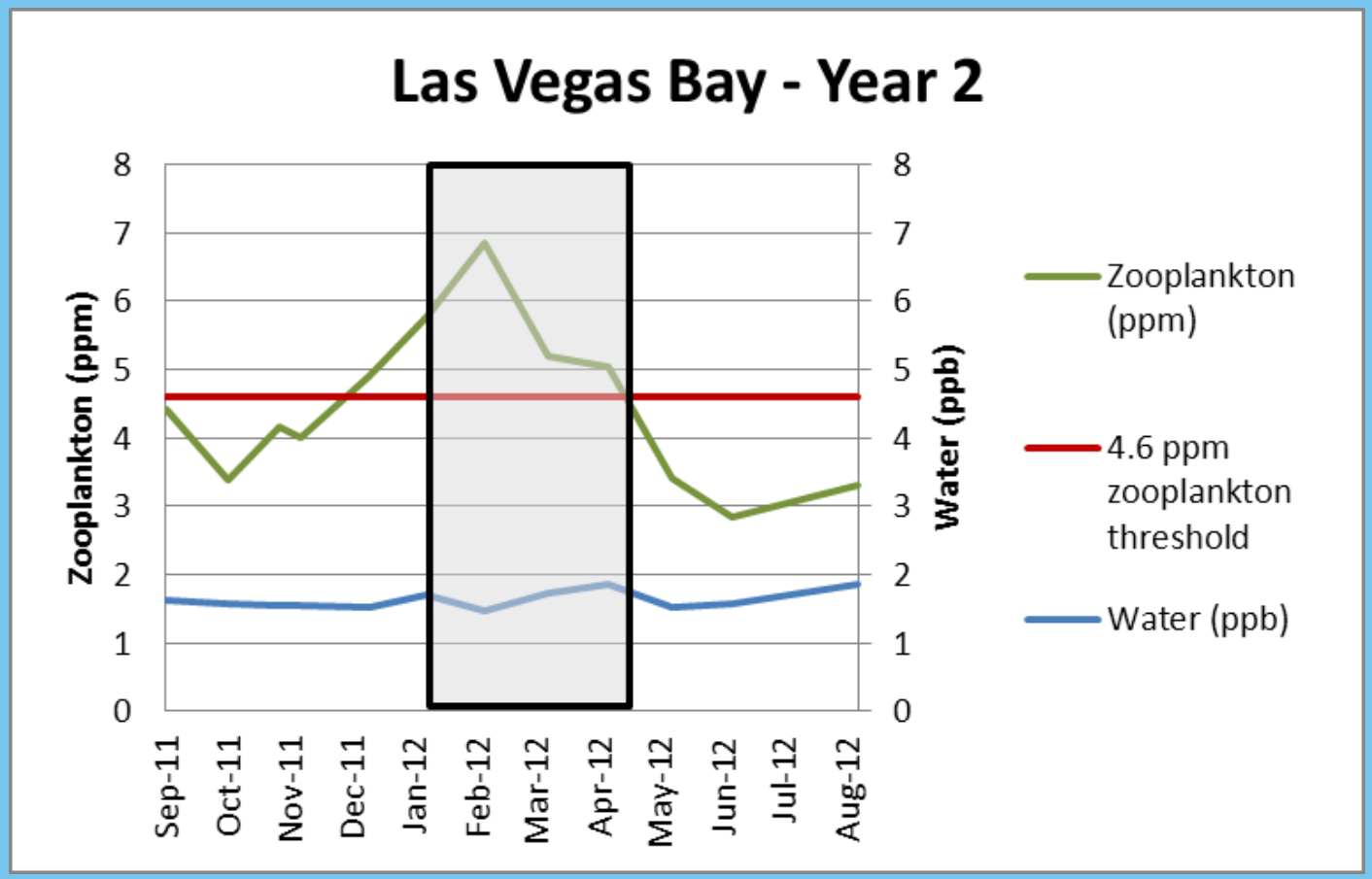
Las Vegas Wash Coordination Committee

www.lvwash.org

LV Bay % Comp Year 1



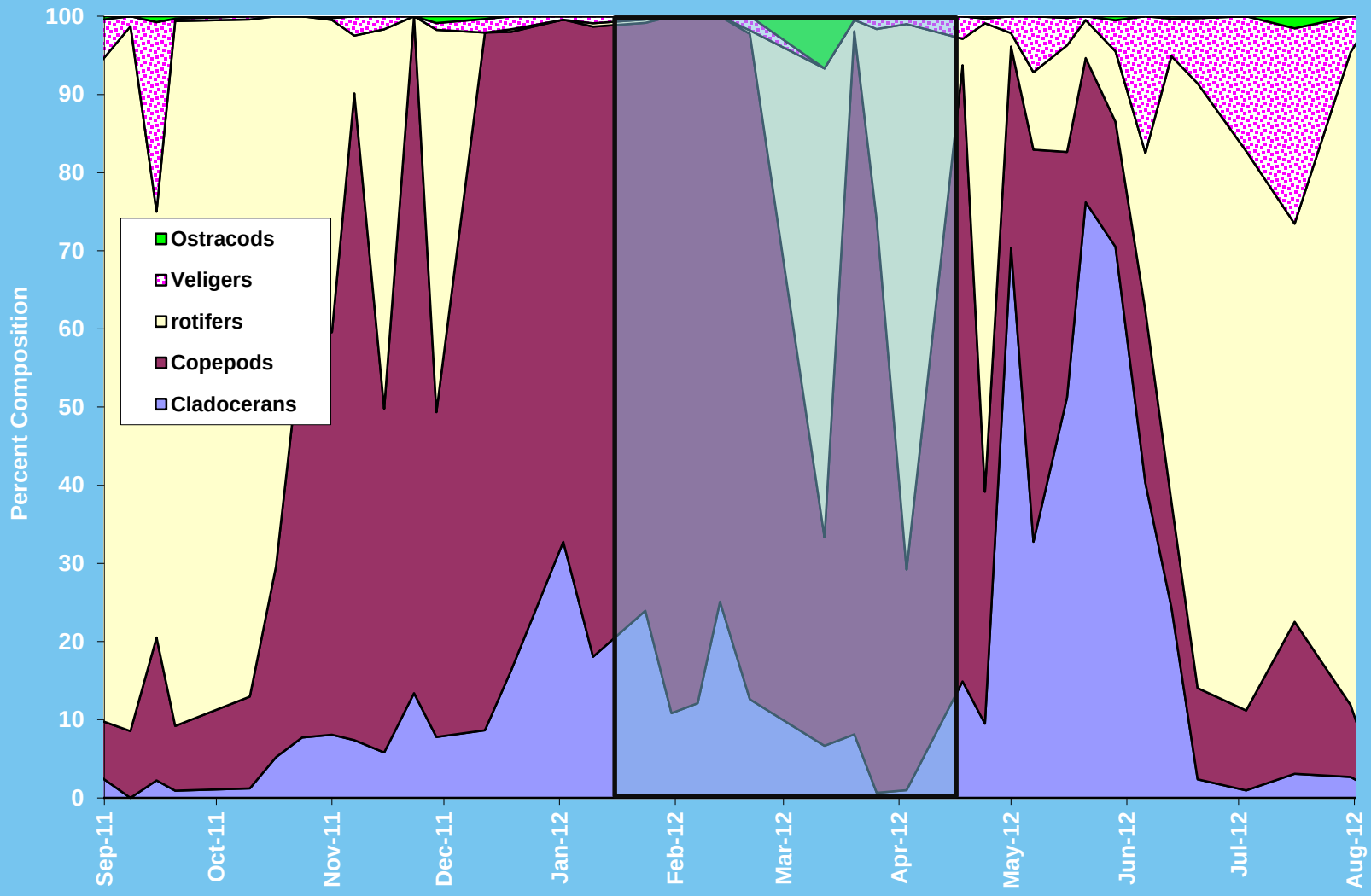
Results



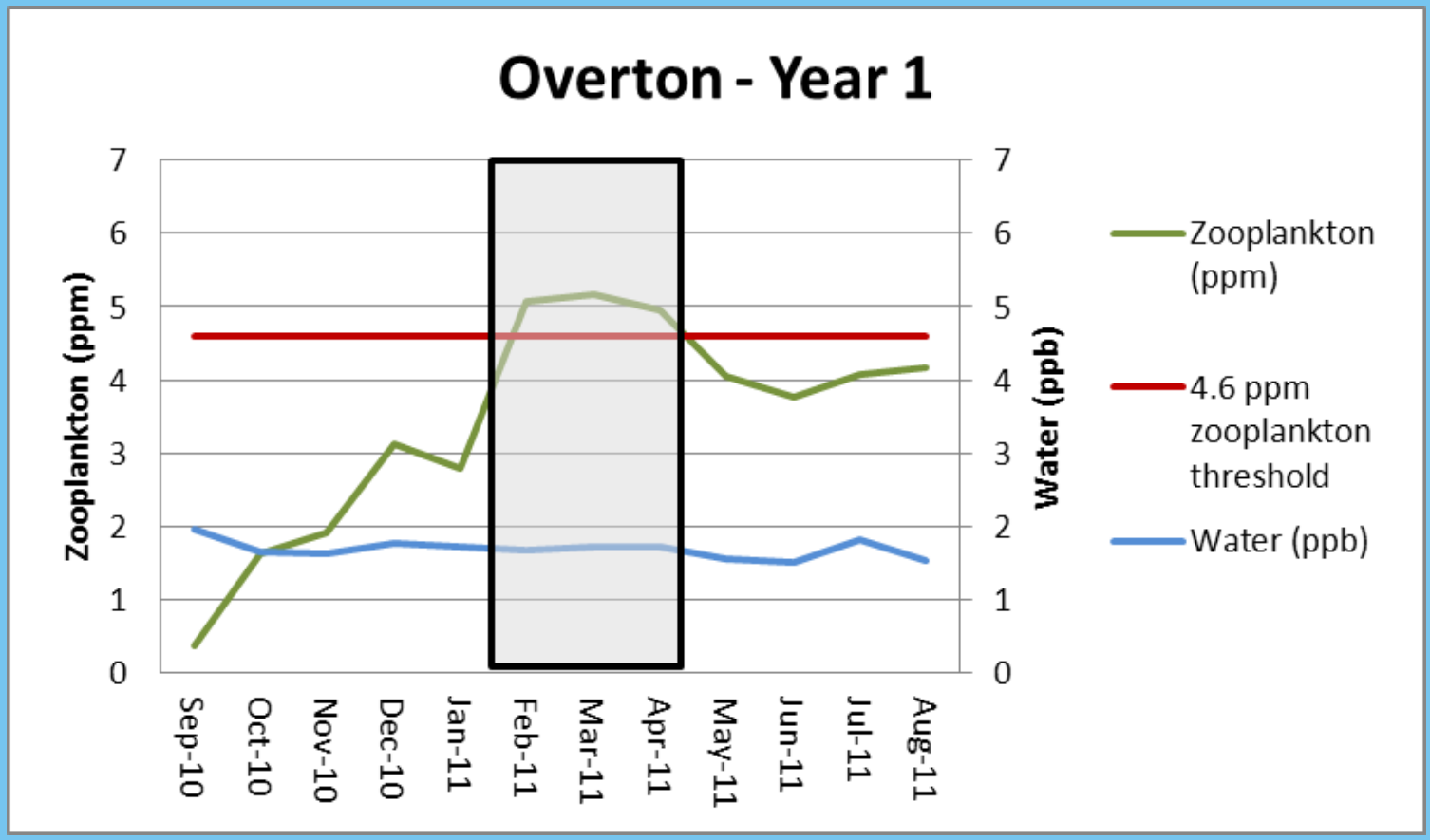
Las Vegas Wash Coordination Committee

www.lvwash.org

LV Bay % Comp Year 2



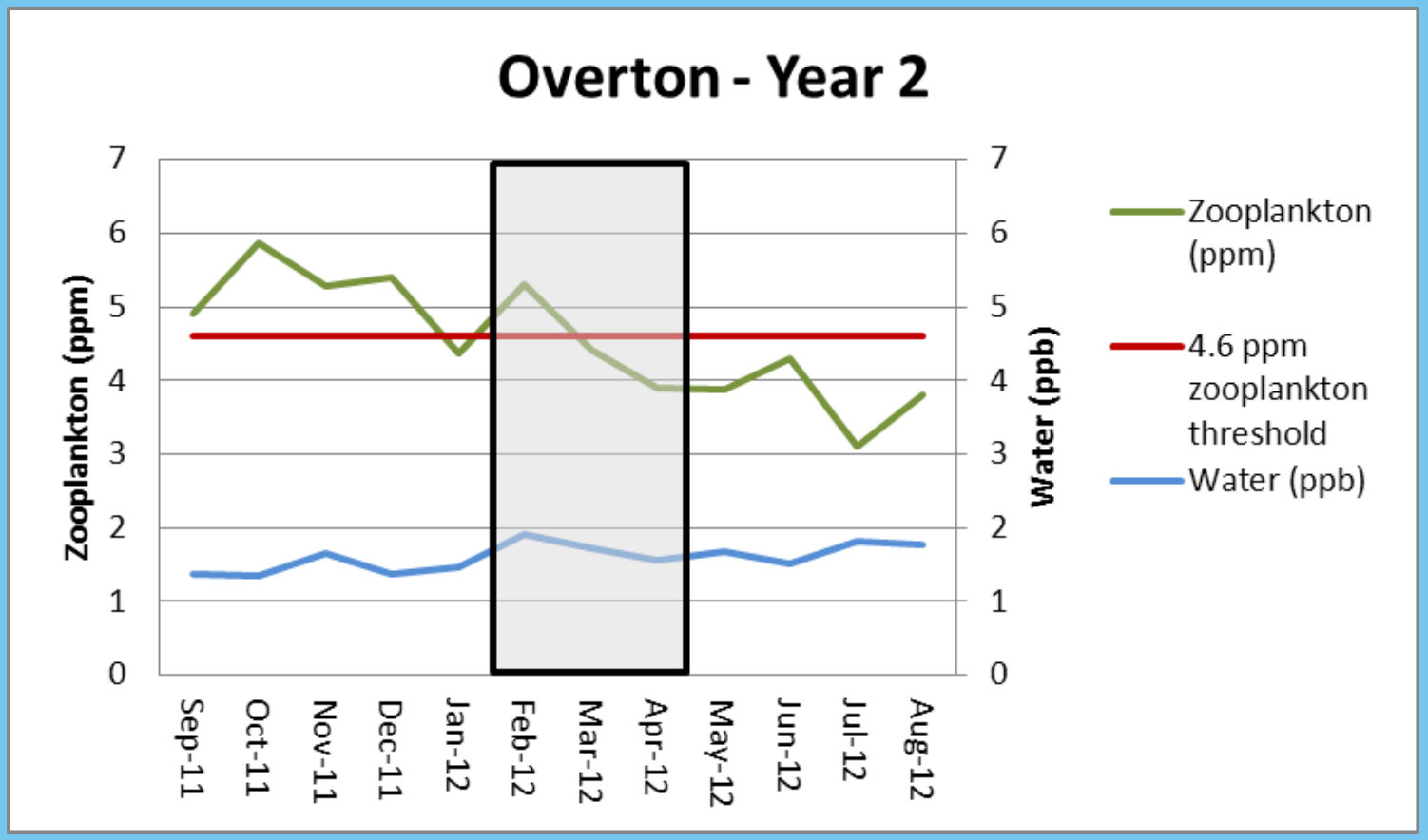
Results



Las Vegas Wash Coordination Committee

www.lvwash.org

Results



Las Vegas Wash Coordination Committee

www.lvwash.org

Conclusions

- Common Carp in LV Wash and LV Bay have exceeded EPA draft criteria
- Zooplankton Se concentrations in both Las Vegas Bay and the Overton Arm can exceed levels found to cause rapid mortality of larval razorback suckers during critical life stage
- Se spike observed in zooplankton during winter/spring, not reflected in water samples
- Zooplankton composition data shows jump in copepod % during winter/spring
- Se concentrations in water and zooplankton similar in Las Vegas Bay and Overton Arm
- Las Vegas Wash isn't unique contributor
- Stabilization efforts not causing direct impact on larval razorback suckers in Las Vegas Bay; can't rule out background Wash/Bay interaction effects

Questions?

Las Vegas Wash Coordination Committee

www.lvwash.org