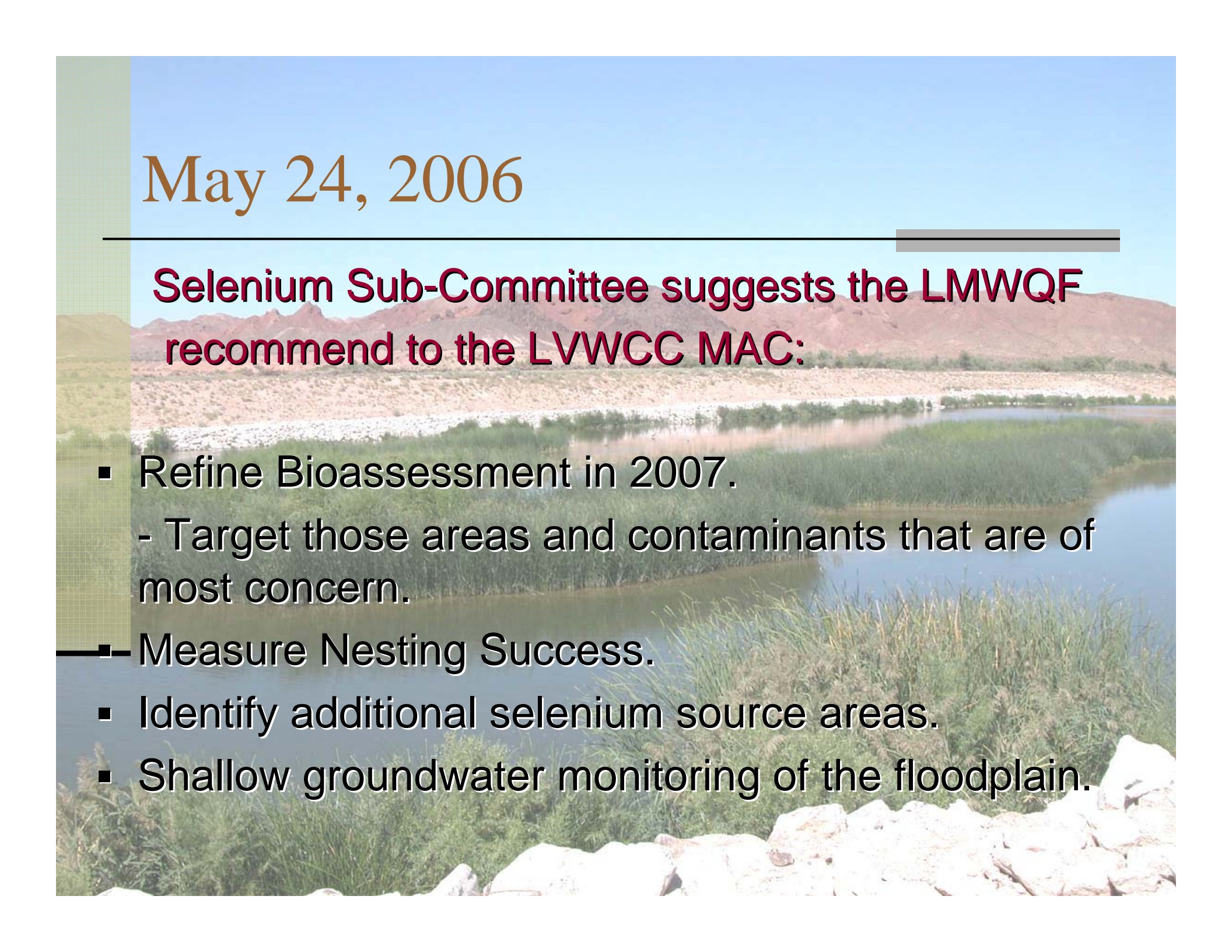




Selenium Research in the Las Vegas Valley, Nevada

Peggy Roefer
Selenium Sub-Committee
April 10, 2007



May 24, 2006

Selenium Sub-Committee suggests the LMWQF recommend to the LVWCC MAC:

- Refine Bioassessment in 2007.
 - Target those areas and contaminants that are of most concern.
- Measure Nesting Success.
 - Identify additional selenium source areas.
 - Shallow groundwater monitoring of the floodplain.

July Meetings

- July 5, 2006 – Research and Environmental Study Team – Reviewed and approved suggested research
- July 10, 2006 – MAC – Requested budget proposal with Selenium Subcommittee recommendations and requested an investigation into selenium treatment or dilution options

2007 Bioassessment

- Refine locations and contaminants for water, sediment, fish tissue, and bird egg sampling

- Locations

Nature Preserve

Duck Creek (near Whitney Mesa)

Henderson Demonstration Pond

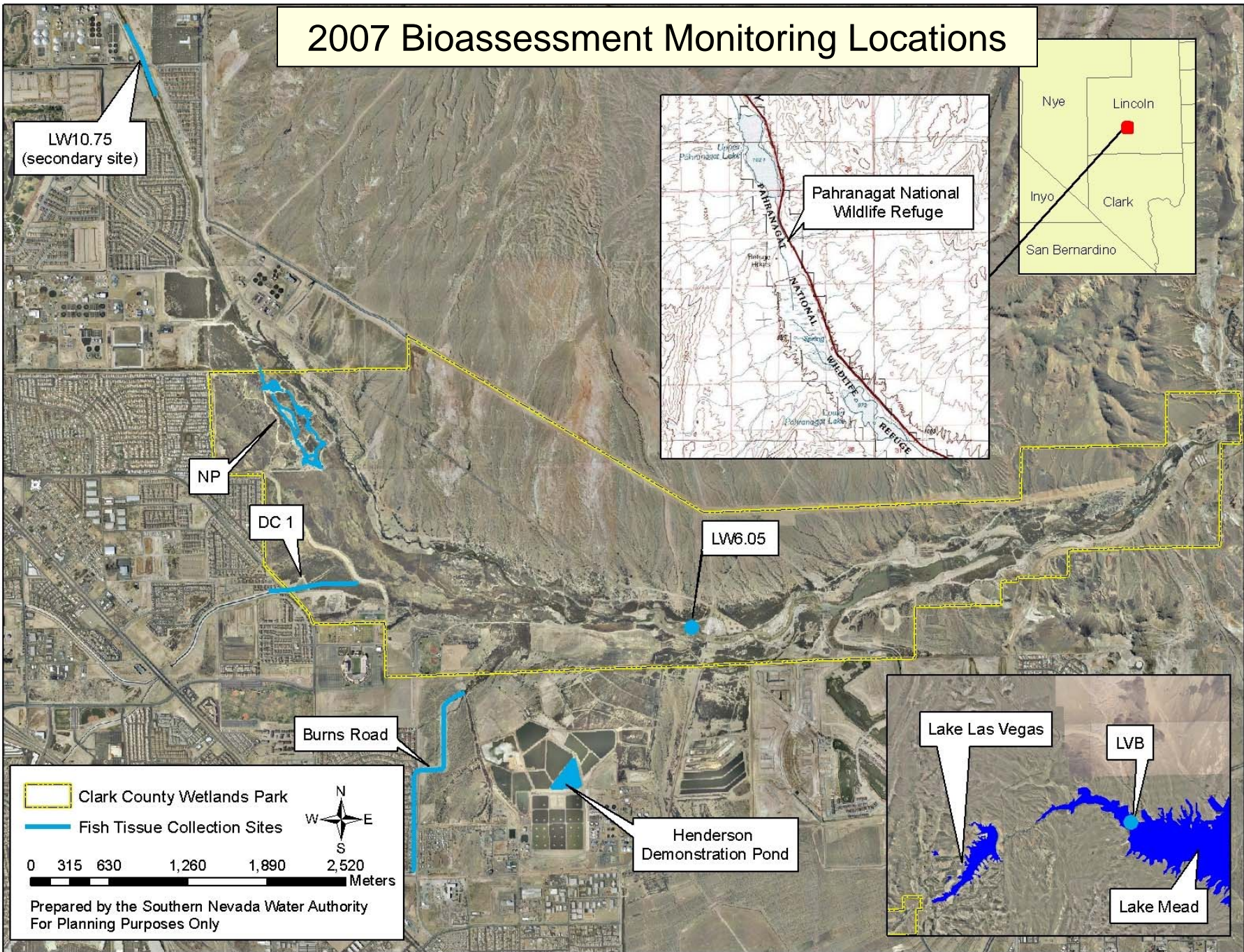
Burns Road/Pittman Wash 2

LW6.05 – Pabco Road

Las Vegas Bay

Pahrnagat National Wildlife Refuge

2007 Bioassessment Monitoring Locations



2007 Bioassessment

- Water quality and sediment samples will be collected at each site
- Six bird eggs and six fish tissue samples will be collected at each site
- Samples will be analyzed for organic and inorganic contaminants
- Results will be analyzed by a qualified toxicologist
- Funding through LVWCC MAC

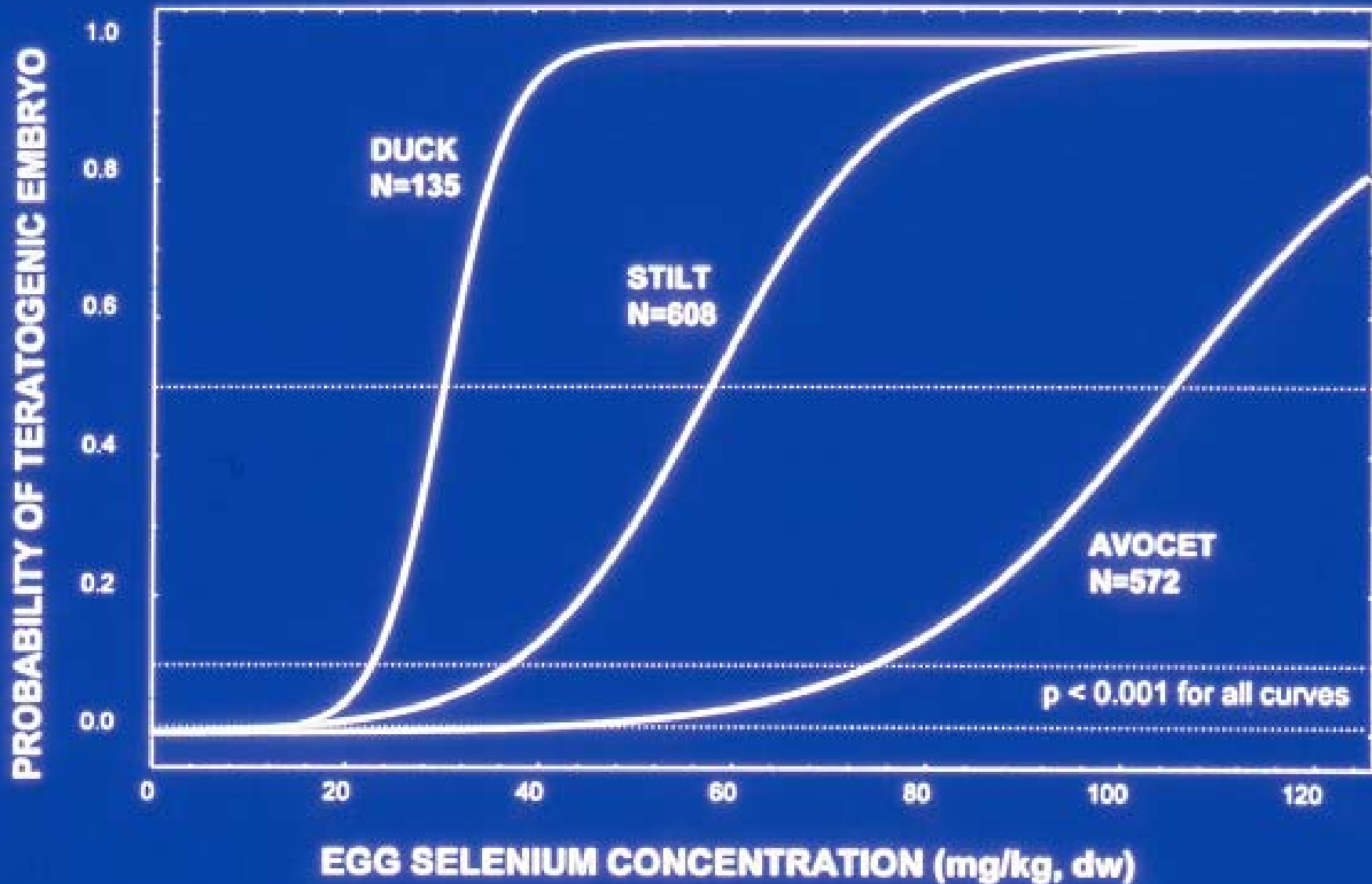
Measure Nesting Success

- Identify Target Species
 - Identify nests
 - Monitor nests
 - Collect late term eggs
 - Incubate eggs
 - Determine if deformities exist
- 
- A landscape photograph of a wetland area. In the foreground, there are white and grey rocks. Behind them is a dense patch of green reeds. A body of water, possibly a reservoir or a lake, is visible in the middle ground, reflecting the sky. In the background, there are reddish-brown mountains under a clear blue sky. The overall scene is a natural, somewhat arid environment.

Measure Nesting Success

- Based on consultation with Dr. Joseph Skorupa, bird nesting success not necessary at this time
- Use data generated in USFWS report “Reconnaissance Survey of Selenium in Water and Avian Eggs at Selected Sites Within the Phosphate Mining Region Near Soda Springs, Idaho, May – June 1999” to determine percent bird nesting success.

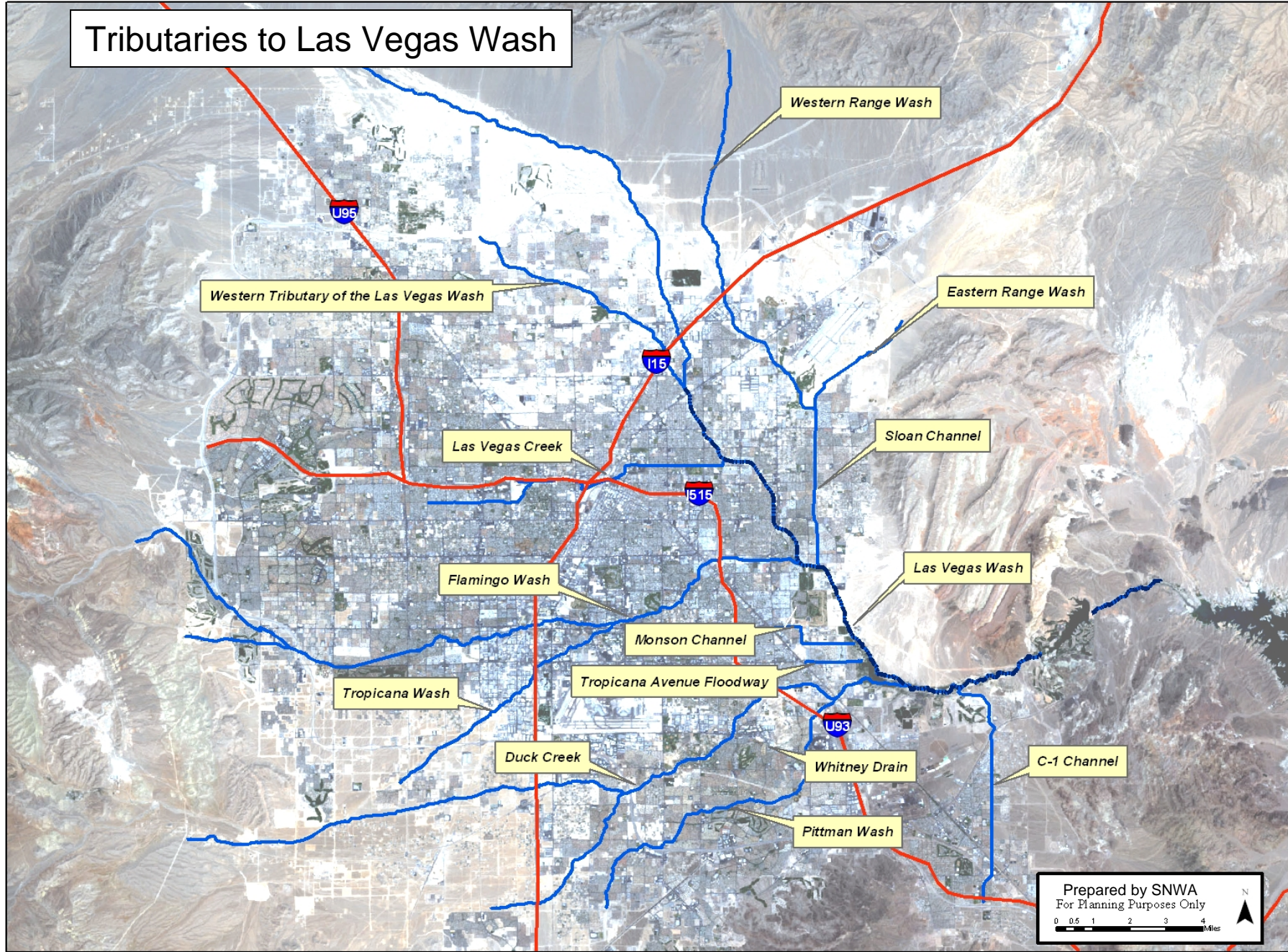
SELENIUM-INDUCED TERATOGENESIS IN NATURE LOGISTIC RESPONSE CURVES



Identify Additional Selenium Source Areas

- Water samples collected on twelve tributaries to the Wash and in Wash above wastewater discharge
- Samples collected every ½ mile
- Samples collected on drains flowing into Wash
- Samples collected summer and winter
- Locations with elevated Se will be recollected and analyzed for cations/anions and Se
- Funding through LVWCC MAC

Tributaries to Las Vegas Wash



Prepared by SNWA
For Planning Purposes Only
0 0.5 1 2 3 4 Miles

Identify Additional Selenium Source Areas

Tributary	Length	No. of Samples
Duck Creek	22 miles	44
Whitney Drain	2 miles	4
Pittman Wash	12 miles	24
C-1 Channel	7 miles	14
Las Vegas Creek	14 miles	28
Las Vegas Wash	23 miles	46
Sloan Channel	5 miles	10
Eastern Tributary RW	4 miles	8
Western Tributary RW	12 miles	24
Monson Channel	3 miles	6
Tropicana Wash	8 miles	16
Flamingo Wash	24 miles	48
Tropicana Ave. Floodway	2 miles	4
	Total	276

Shallow Groundwater Monitoring in the Flood Plain

- Water level will be tracked using a transducer over time in 5 shallow wells from the Nature Preserve to the Pabco Road ECS + one deeper well in the Nature Preserve
- Samples will be collected monthly from the 5 wells and analyzed for selenium and cation/anion
- Two soil horizons will be characterized using SEM and clay mineralogy and analyzed for surface area, particle size, and sequential extractions for Se will be performed.
- Funding proposed for BOR 2007- 2008 budget

Total for Selenium Sub-committee Request

Bioassessment = \$250,550

Identify Additional Selenium (MAC)

Source Areas = \$32,200

Shallow Groundwater (MAC)

Monitoring in Flood Plain (TBD)= \$59,800

Total= \$342,550

October Meeting

- October 10, 2006 – MAC reviewed and approved funding for selenium research requested by Selenium Sub-Committee and approved request for 319 grant funding for selenium treatment research



Selenium Treatment or Dilution Research using 319 Grant Funding

- Variability in selenium concentrations in the influent and effluent of wastewater treatment plants
 - Weekly influent/effluent at three WWTF
 - Influent and effluent of major processes 10 times
 - Hourly sampling influent for 24 hour period 4 times
- Bench scale testing of wastewater treatment process to determine selenium removal

Selenium Treatment or Dilution Research using 319 Grant Funding

- Applied for EPA 319 grant funding for project in November 2006
- Total cost of grant - **\$100,000**
- Funding approved January 2007, SNWA Board approval April 2007

Questions/Comments

