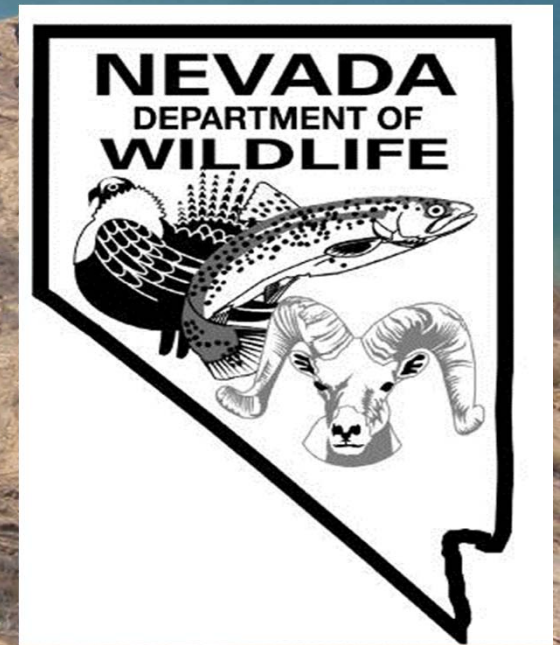


Nevada Department of Wildlife



Lake Mead Razorback
Sucker Augmentation

Brandon Senger

Outline

- Larval Collecting
- Fish on Station
- Water Quality
- Overton Wildlife Management Area
- Flow Conditioning Study

Larval Collection

<u>Source</u>	<u>2010</u>	<u>2011</u>
Echo Bay	635	2,666
Las Vegas Bay	210	404
<u>Total</u>	<u>845</u>	<u>3,070</u>



Fish On Station

2008 Fish

- 59 (380 stocked to Davis Cove in early summer)

2009 Fish

- 750 (600 stocked into Center Pond)

2010 Fish

- 2,000

2011 Flannelmouth Sucker

- 120

New Rearing Space

- Native Fish Room was previous rearing room
- Inside the hatchery is our current rearing space



Native Fish Room

- Previous rearing room
- 6 – 700 gallon fiberglass tanks
- 4 – 240 gallon fiberglass troughs
- 10 gallon aquaria



Native Fish Room



Indoor Fiberglass Capacity

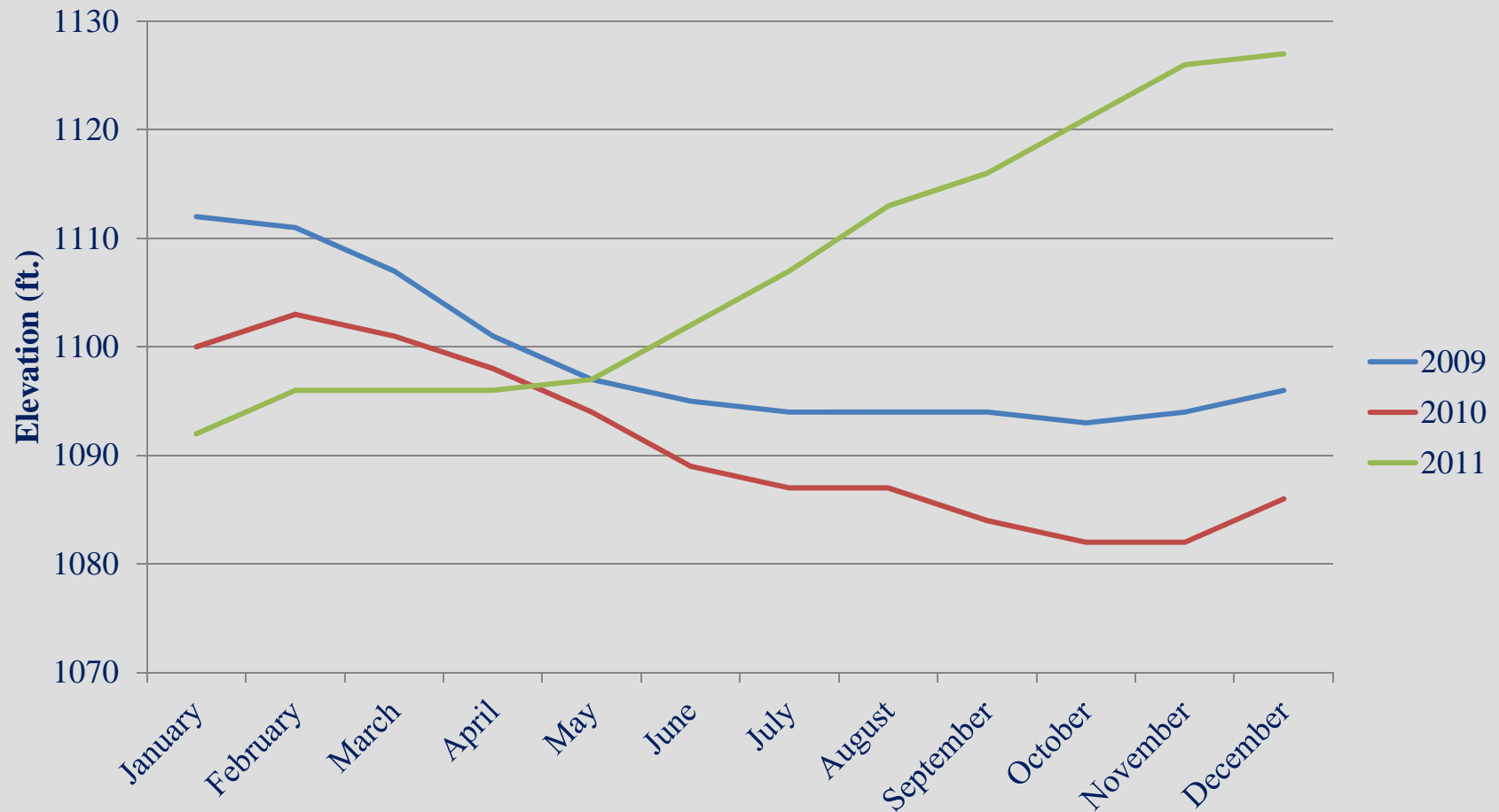
- 10 –
20' x 4' x 2.3'
tanks (1,421
gallons)
- 10 –
30' x 4' x 2.3'
tanks (2,094
gallons)
- 10 –
40' x 6' x 2.7'
tanks (4,788
gallons)



Indoor and Outdoor Concrete Raceways

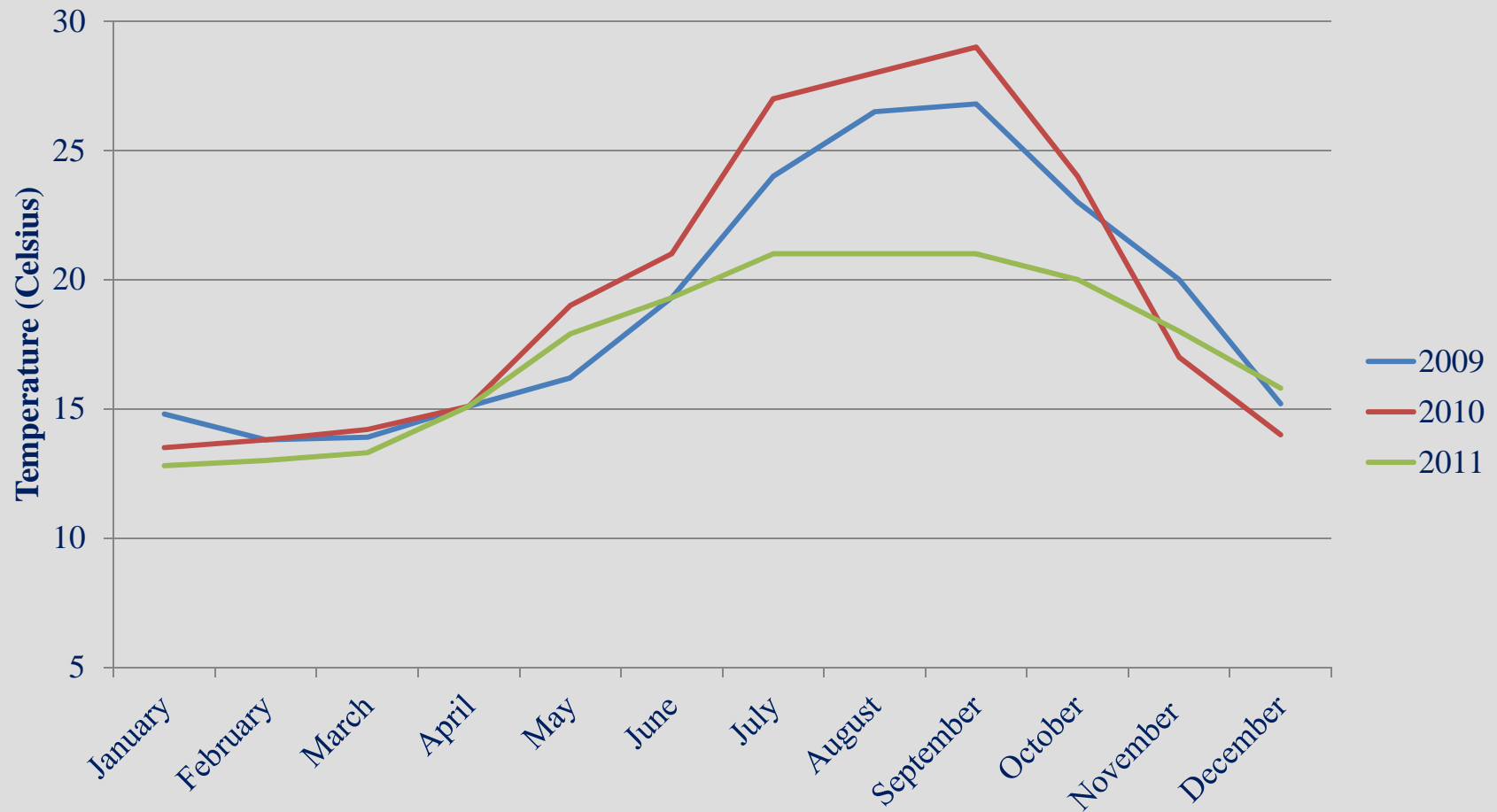


Lake Mead Elevation



*Data collected from USBR
(<http://www.usbr.gov/lc/region/g4000/hourly/mead-elv.html>)

Hatchery Water Temperatures



Overton Wildlife Management Area

- Surveyed Center Pond in November
- 600 2009 razorback suckers stocked in December
- Working on renovation ideas



Center Pond Survey

- November 1 & 2

Species	#	Avg. TL (mm)	Avg. Wt (kg)	% Biomass	% Species Composition	CPUE (fish/nn)
Razorback	110	476	1.25	69.7	61.1	20.8
Carp	32	435.7	1.18	19.2	17.8	6
LMB	31	343.2	.587	9.3	17.2	5.8
Bullhead	6	332.8	.6	1.8	3.3	1.1
Bluegill	1	170	.17	0.1	0.6	0.2

- Two sub-adults captured (266 and 285 mm TL)

Center Pond Razorbacks

Sub-adult



Adult



Carp Die Off (July 31, 2011)



Gasping for Air



Carp Die Off



Evaluation of Flow Conditioning Razorback Suckers in Flow-Through Raceways at Lake Mead Fish Hatchery



Trials 2 & 3

Trial 2

- Winter 2011
- Control
- Two Treatments
 - 12 hour treatment
 - 18 hour treatment
- Only used 4 pump laid down design (TR 2 in Trial 1)
- 12-hour belt feeder
- 13° Celsius

Trial 3

- Summer 2011
- Control
- Two Treatments
 - 12 hour treatment
 - 18 hour treatment
- Only used 4 pump laid down design (TR 2 in Trial 1)
- 12-hour belt feeder
- 19° Celsius

Mean Failure Velocities



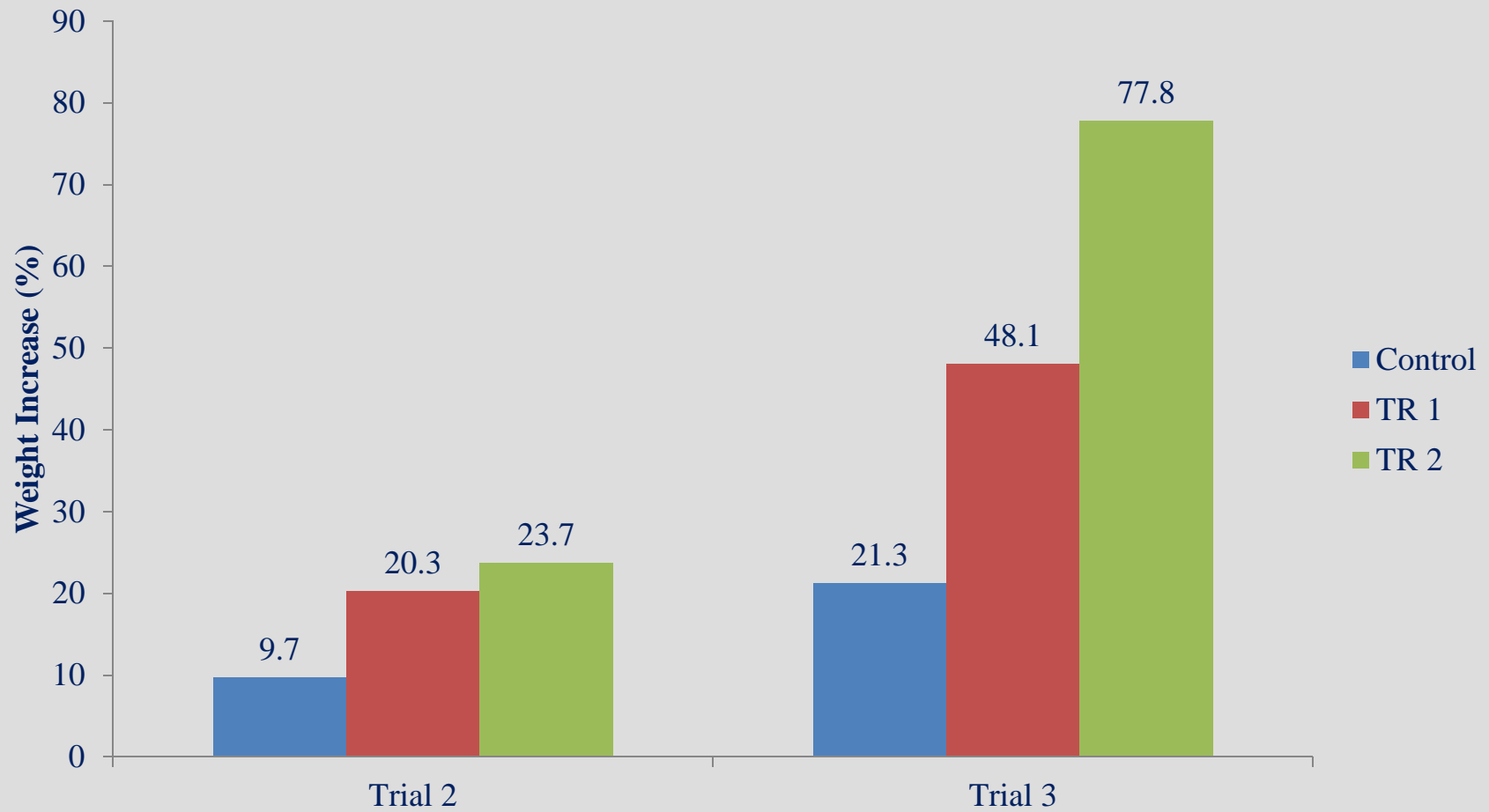
Growth Results

	<u>Fish/lb</u>			<u>Food Conversion Rate</u>	
	Trial 2	Trial 3		Trial 2	Trial 3
Pre-Trial	3.7	2.5	Control	6.3	2.4
Control	3.4	2.1	TR 1	3.0	1.0
TR 1	3.1	1.7	TR 2	2.5	0.7
TR 2	3.0	1.4			

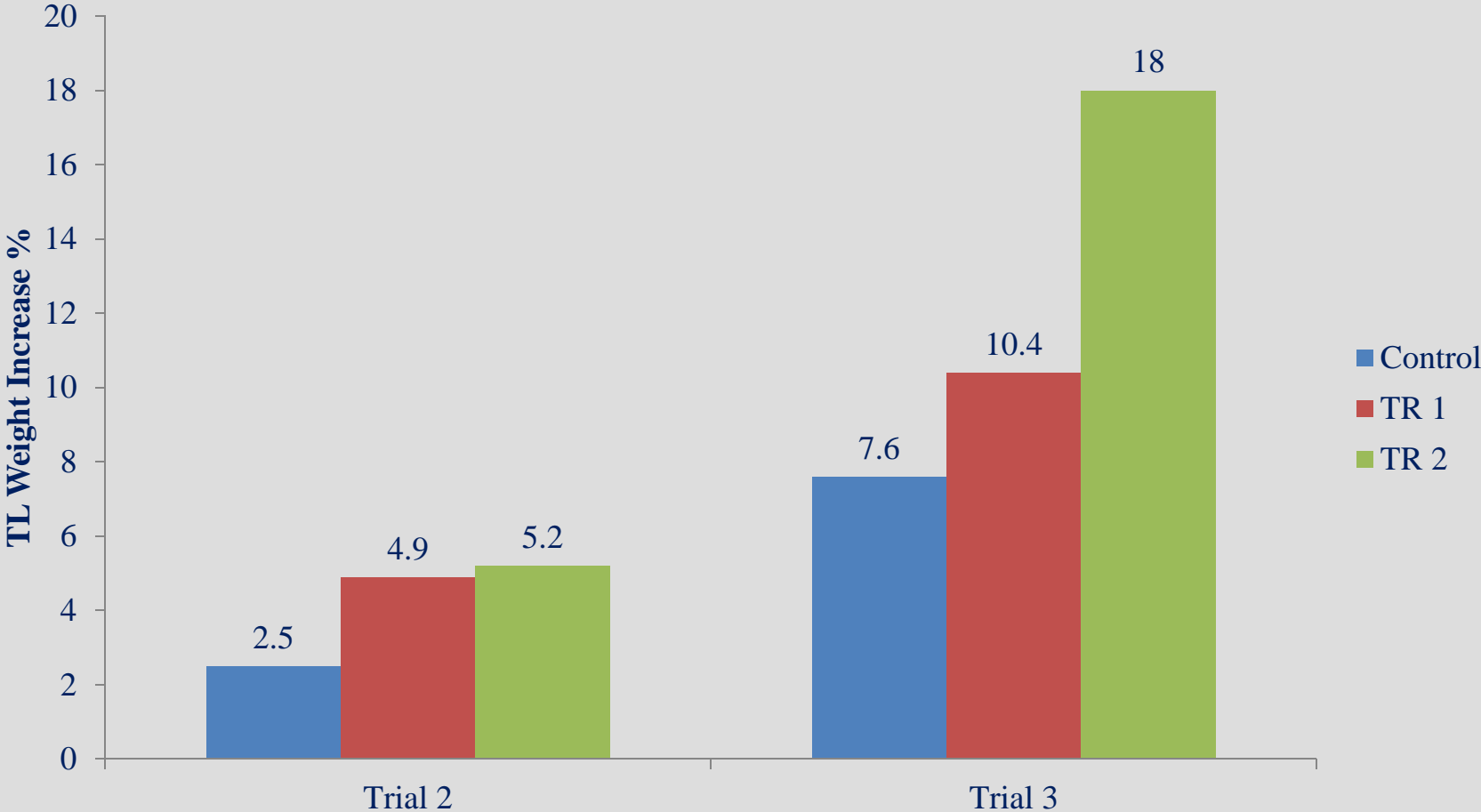
TL Growth



Weight Increase



TL Growth



2011 Flow Conditioning Summary

- Completed winter (coldwater) and summer (warmwater) trials
- Flow conditioning effective in both trials
- Improved...
 - Failure velocities
 - Growth (weight & TL)
 - Feed conversion efficiencies

Future Ideas

- Continued Flow Conditioning
 - Stocking of flow conditioned fish
- Predator Avoidance Studies
 - Develop predator avoidance training
 - LMB/SMB vs Stripers
 - Turbidity and predation
 - Habitat use and predation
- Razorback/quagga research
 - UNLV
- Transporting fish from mussel positive water
- Space