Lower Colorado River Multi-Species Conservation Program

Balancing Resource Use and Conservation

2015 Lake Mohave Update

Remote Scanning Study
Draft Summary

Bonytail and Razorback Sonic Telemetry

Jim Stolberg
Bureau of Reclamation
LCR MSCP

Remote Scanning Study

Objectives

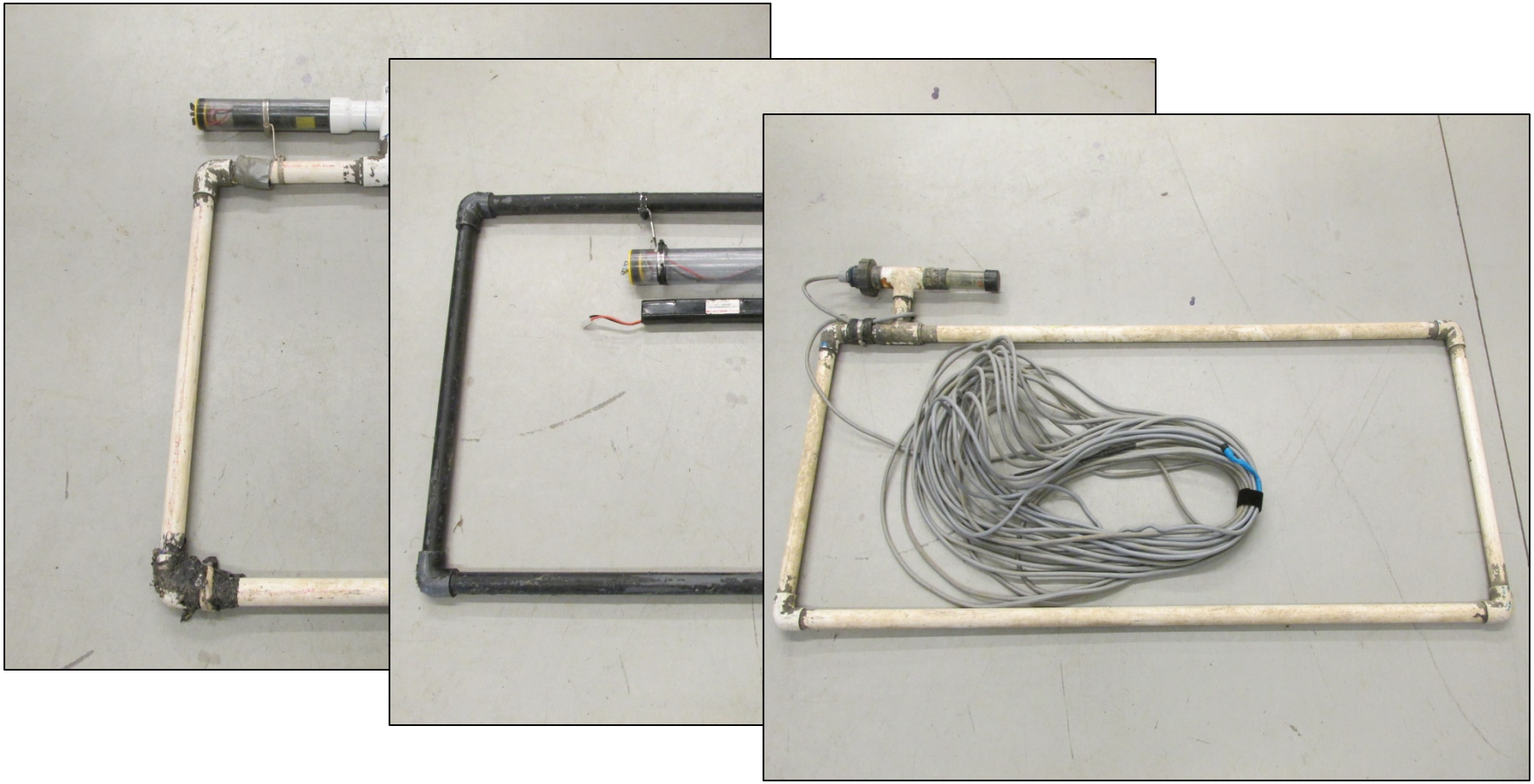
- Compare Lake Mohave razorback sucker “Basin” subpopulation estimates from March Roundup trammel netting and remote scanning efforts
- Address Lake Mohave NFWG concerns regarding annual handling

> trammel net estimates are based on two years of data, so a comparison of estimates will not be available until 2016

> Presented is an initial summary of 2015 scanning data describing the distribution of contacts/recaptures and providing subpopulation estimates for Basin spawning areas

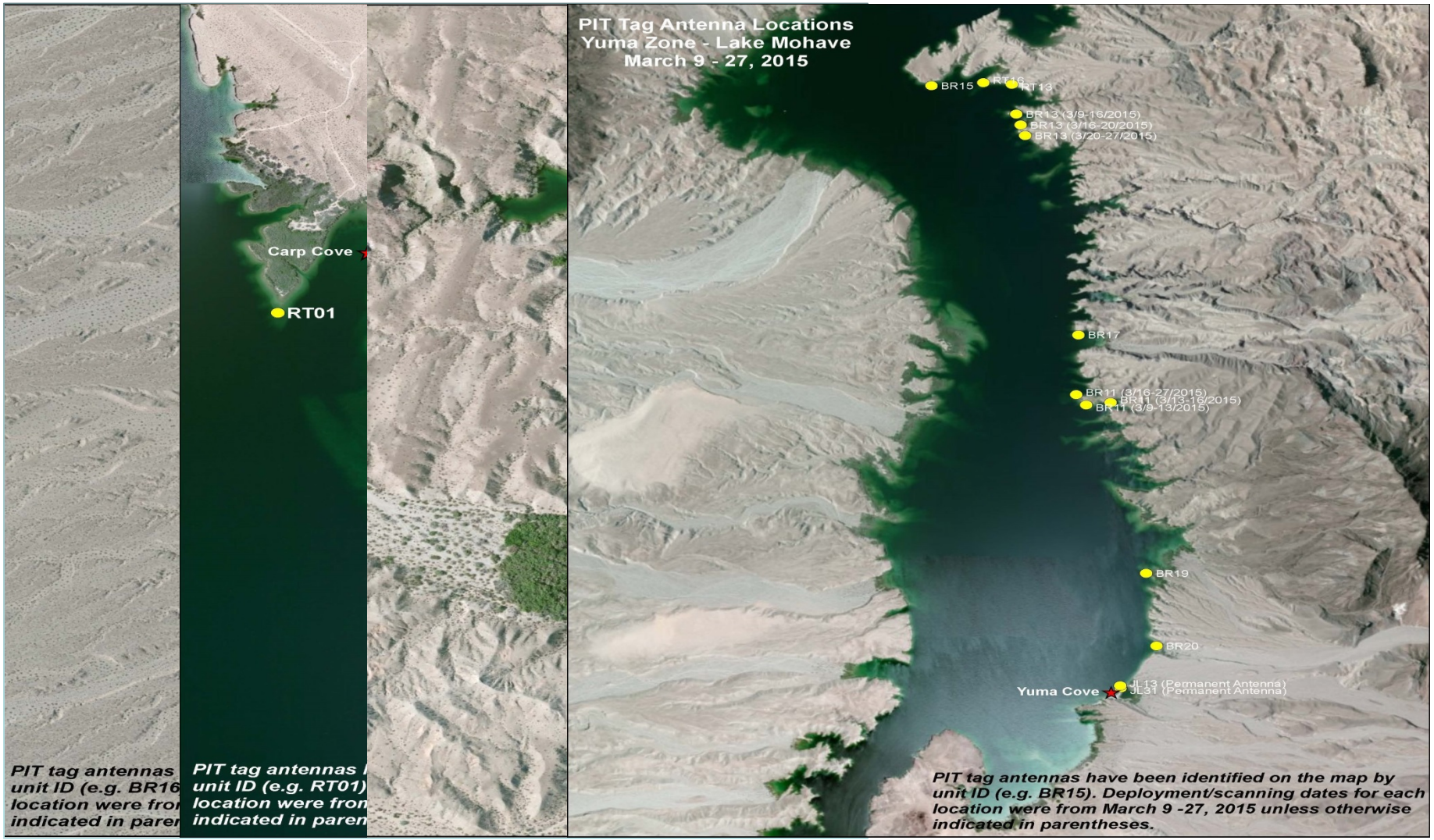
Methods

- Twenty-two mobile and three permanent scanning units were deployed in four areas of the lake during the study period (March 9–27, 2015)



Methods

- Mobile and permanent scanning unit deployment locations



Methods

- The number of total and unique contacts was summarized by scanning unit, scanning unit type (mobile or permanent), date, and download period (5 total download periods)
- Same-year population estimates were examined by comparing several closed population methods
- Recaptures were defined as being separated by at least one download period

Results

Contact Summary

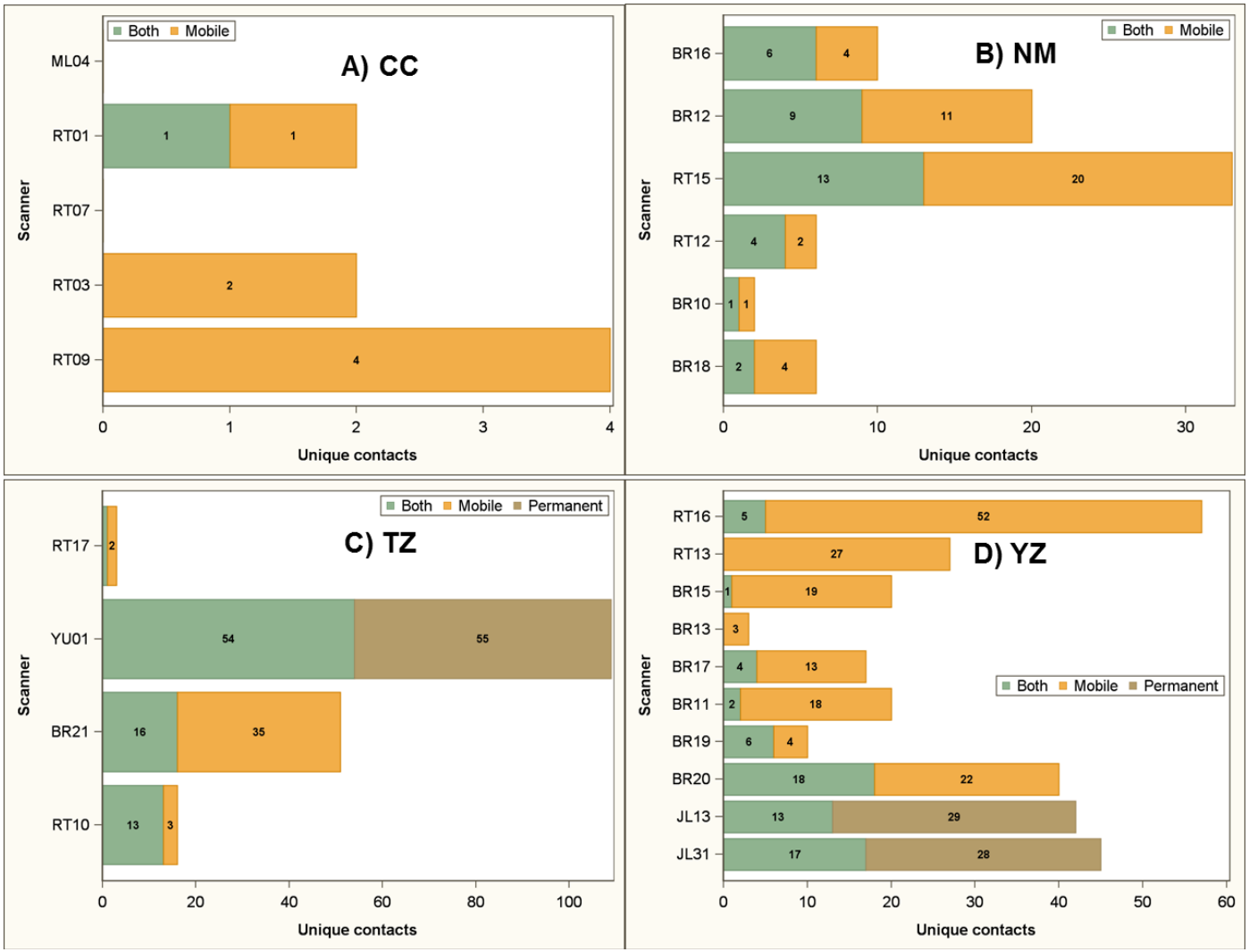
- 1,718 total contacts representing 395 unique PIT tags
- Only 1 fish stocked in 2015 was contacted
- 24% (96 fish) were contacted by permanent units only, 57% (226 fish) by mobile units only, and 18% (73 fish) by both

Distribution

- Approximately 74% (291) of fish contacted only one scanning unit
- 26% (104 fish) contacted at least two units in one or more areas
- One fish was contacted by five scanners across all four sampling areas (Nine Mile Zone 3/13, Carp Cove Area 3/15, Tequila Zone 3/16, Yuma Zone 3/19)*
- Recaptures (199): 49% at the same unit, 40% at a different unit, and 11% at both during one or more subsequent download periods

Results

Distribution



Unique contacts at each scanning unit (only mobile, only permanent, both). Scanning units ordered from north to south within each sampling area, A) CC = Carp Cove, B) NM = Nine Mile, C) TZ = Tequila Zone, and D) YZ = Yuma Zone.

Results

Single Year Population Estimates

Lake Mohave razorback sucker Basin subpopulation estimates from March 2015 remote sensing data based on several closed population methods. The bold estimate was considered best by the CAPTURE selection algorithm.

Method	Pop. Size	95% CI
M_{th} (Chao)	**834**	**712-1002**
M_h (Jackknife)	832	760-918
M_h (Chao)	836	710-1013
M_t (Chao)	737	639-875
M_t (Otis et al. 1978)	572	529-627
M_o (Otis et al. 1978)	576	533-634
SC1	918	783-1101
SC2	755	645-912
Lincoln-Petersen (Ricker)	690	579-833
Mean LP	545	492-598
Multiple LP	706	648-764
Schnabel	535	447-666
Schumacher-Eschmeyer	585	386-1209

Questions

Acknowledgements

- Nathan Rudd, Biometrician, LCR MSCP
- LCR MSCP Fisheries Staff
- Marsh & Associates, LLC

Sonic Telemetry Update

Objectives

- Bonytail - Assess dispersal, movement patterns, habitat use, and survival
  - Identify appropriate locations for future stockings
  - Evaluate augmentation value for this species in Lake Mohave

- Razorback - Monitor movement/movement patterns of individual fish
  - Evaluate spawning site fidelity and habitat use/preference
  - Use data to sample additional areas of the lake

Methods

Bonytail

- Nineteen bonytail (377-422 mm TL) were obtained from the Lake Mead hatchery and implanted with 9 month acoustic transmitters (IBT-96-9-I, Sonotronics, Inc.)
- Stocked at Arrowhead Cove (RM 3.5), on 10/7/15 with a cohort of ~400 bonytail

Razorback

- Nineteen razorback (515-635 mm TL) were captured from Lake Mohave and implanted with 3 year acoustic transmitters (CT-05-36-I)
- Nine fish were stocked at Willow Beach (RM 52) and 10 were stocked at Katherine Landing (RM 2) on 3/10/15

Methods

Acoustic Telemetry

- Towable and directional hydrophone used for active tracking
- 26 SURs deployed for passive tracking

LAKE MOHAVE SUR LOCATIONS - AS OF DECEMBER 9, 2015

#	Physical Location / Attachment Point	~River Mile	Reservoir Side / State	SUR ID	UTM		
1	Across from Mile Marker 61 / Tamarisk	61	AZ	10695	11S	0703671	3983676
2	Black Bar / Tamarisk	56.5	AZ	10696	11S	0706885	3977535
3	Point Across from WB Hatchery Buoy Line / Tamarisk	52.75	NV	10697	11S	0710760	3972487
4	Kayak Cove / Arrow weed	52.75	AZ	10698	11S	0710657	3972669
5	S of Monkey Hole / Tamarisk on cliffside	47.75	NV	10699	11S	0708054	3967887
6	Chalk Cliffs / Tamarisk below Nav. Light	43	AZ	10700	11S	0708418	3959212
7	Chalk Cliffs / Tamarisk by No Ski Sign (approach from South)	43	NV	10701	11S	0708306	3959386
8	N. of Liberty Cove - Tamarisk on cobble beach	38.5	AZ	10702	11S	0708637	3953259
9	Small Cove N. of the Powerlines - Tamarisk on N. point	34.5	AZ	10703	11S	0709354	3940787
10	N. of Opal Cove / Tamarisk on shoreline	29.25	NV	10704	11S	0711716	3940976
11	Owl Point Cove / Tamarisk on S. point	29	AZ	10705	11S	0711786	3940390
12	Yuma Cove / Tamarisk on spawning beach	24	AZ	10820	11S	0712684	3933611
13	S. Point Klondike Cove / Tamarisk on small rock island	23.5	NV	10706	11S	0710699	3932844
14	Painted Canyon / Tamarisk below Nav. Light	23.5	AZ	10707	11S	0710895	3932656
15	Tequila Cove / Tamarisk on spawning area point	21	NV	10708	11S	0710589	3928267
16	South Haystack Cove / Rock on N. point	11.75	AZ	10709	11S	0717779	3915896
17	Clam Cove / Tamarisk on N. point of cove	11.75	NV	10710	11S	0716891	3915578
18	White Rock Wash Cove / Rock on N. point	9.75	NV	10711	11S	0717636	3913085
19	Katherine Powerline Cove / Rock on S. point	5.5	AZ	10712	11S	0719376	3906054
20	N. Point Rams Head Cove / Tamarisk on cliffside	5.5	NV	10623	11S	0718823	3906044
21	Shoreline N. of Cholla Cove / Tamarisk on cliffside	4	NV	10774	11S	0719294	3904174
22	Forked Coves / Tamarisk on small point	3.25	AZ	10792	11S	0720189	3902921
23	Newberry Cove / Rock on island N of cove	3.25	NV	10713	11S	0719279	3902908
24	N. Point Katherine Landing Entrance / Tamarisk on cliffside	2	AZ	10790	11S	0720270	3900726
25	N. of Paiute Cove / Tamarisk on cliffside	2	NV	10791	11S	0719849	3900611
26	Ski Pass Cove / Tamarisk on S. point of large island	0.75	AZ	10714	11S	0720583	3898839

Results

Contact Summary

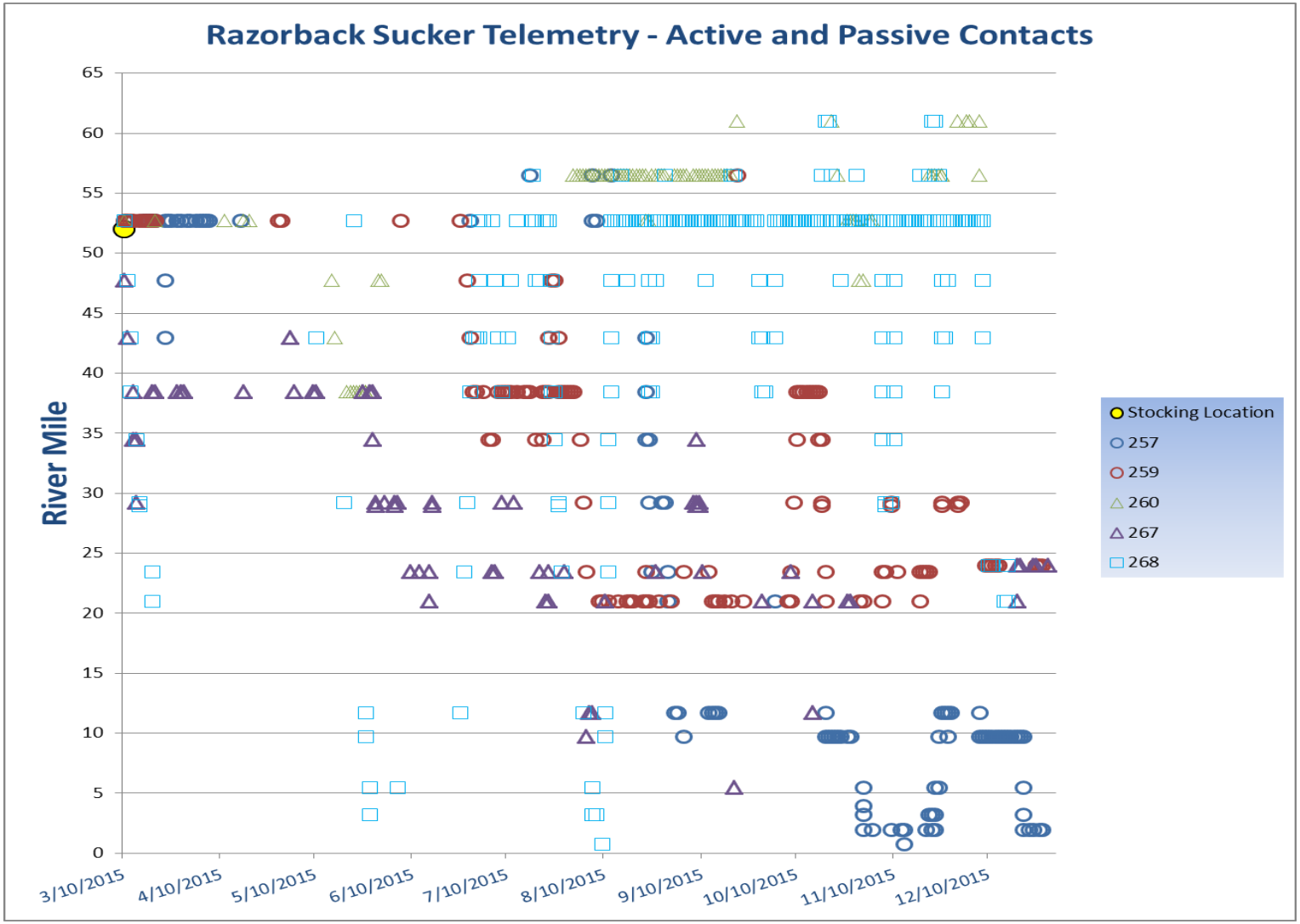
- 116,573 passive and 151 active contacts
- Notable: 19,535 contacts at Black Bar, 40,038 at Willow Beach, 32,455 at Liberty Cove, and 11,462 at White Rock Wash Cove
- 17 of 19 razorback have been contacted monthly since release
- 4 bonytail have not been contacted since the week of release
- 4 others have not been contacted since November

Distribution

- Razorback dispersed widely throughout the lake 3-6 months post stocking
- All razorback have been contacted at Liberty Cove (RM 38.5) regardless of stocking location
- Late spring and Summer active contacts indicated razorback were using mid-channel habitat. Fall contacts show a shift inshore
- 7 of 19 razorback have moved back to their capture locations
- Contacted bonytail remain near their stocking site
- Weekly movement has been observed to be less than 6 miles
- SUR contacts have generally occurred from 4 pm – 7 am

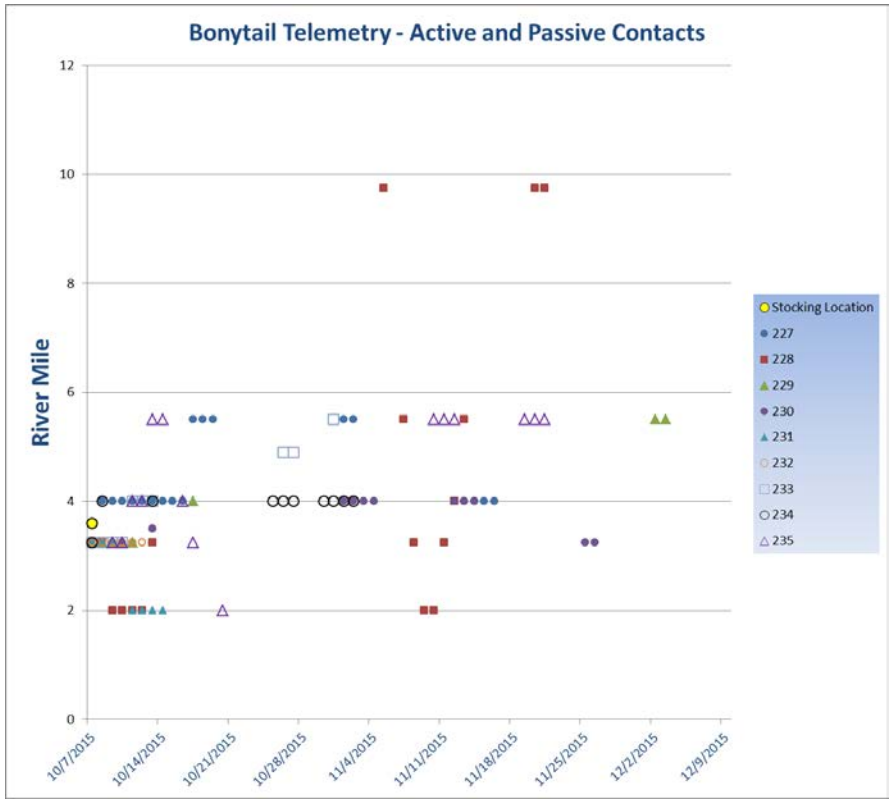
Results

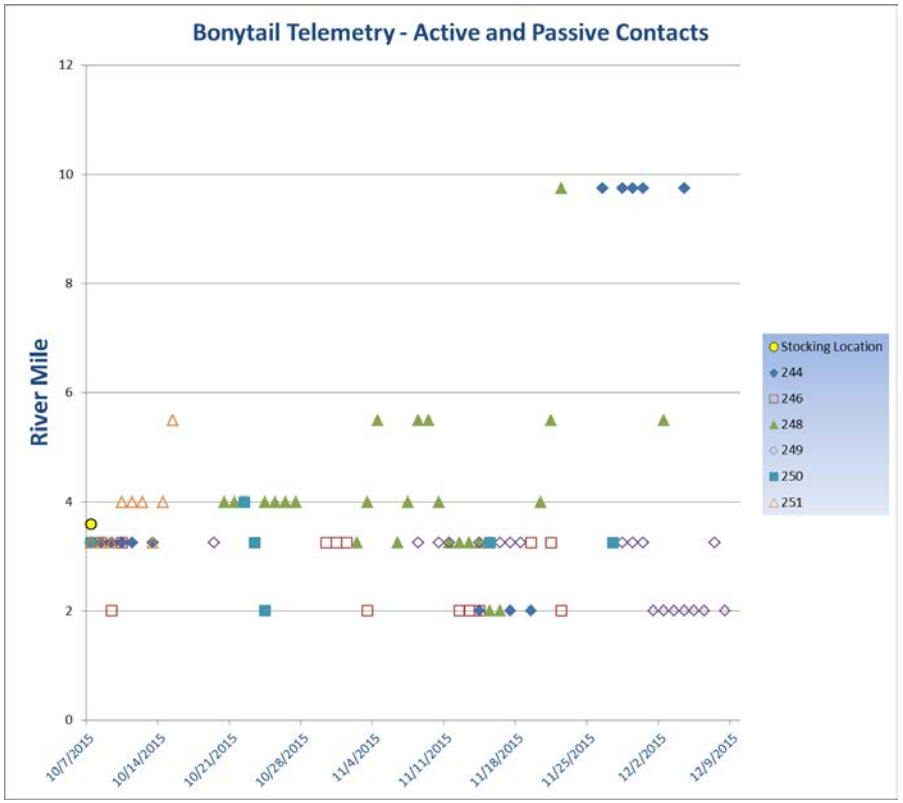
Distribution



Results

Distribution





Questions

Acknowledgements

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- LCR MSCP Fisheries Staff