

Lower Colorado River Multi-Species Conservation Program



Balancing Resource Use and Conservation

Lake Mohave Update

Remote Scanning Study

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Remote Scanning Study



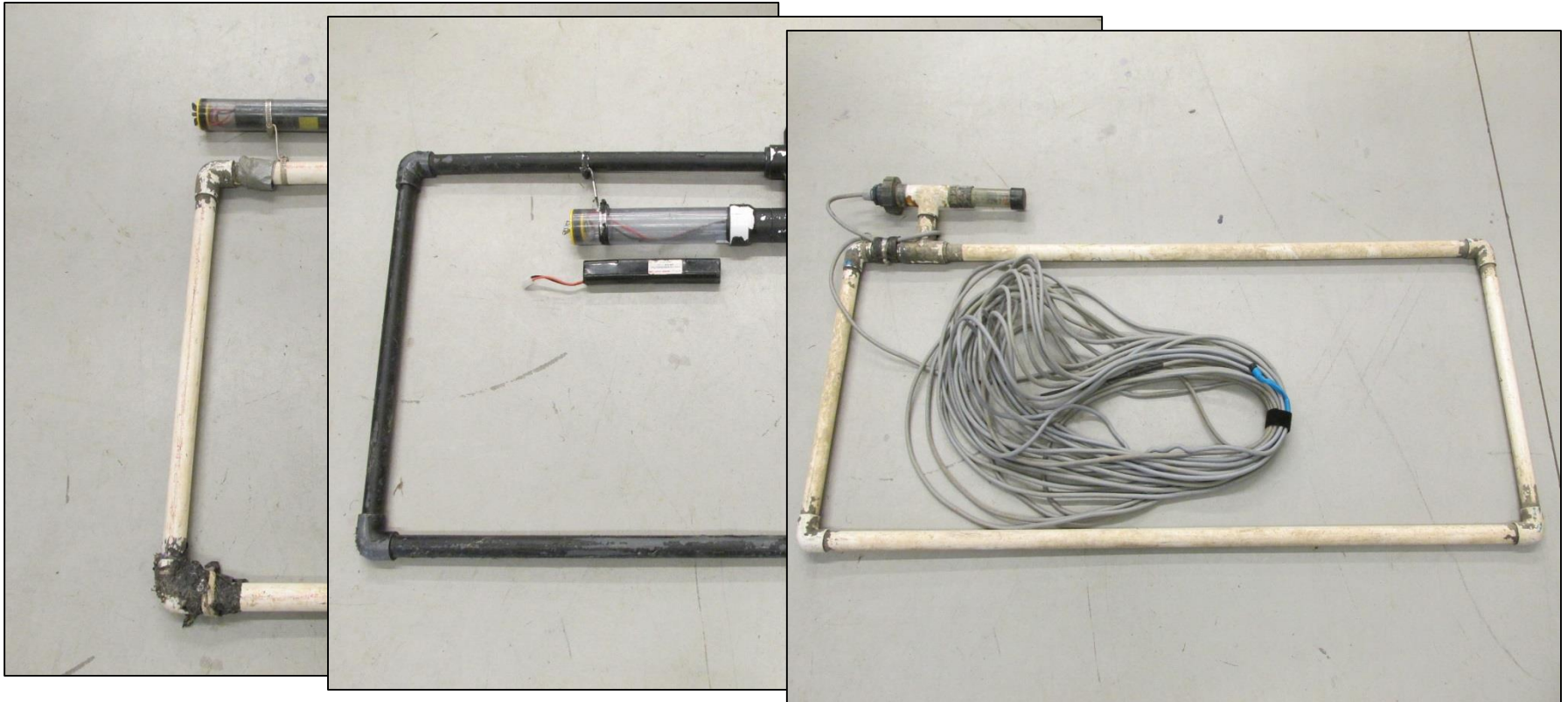
Objectives

- 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

Methods



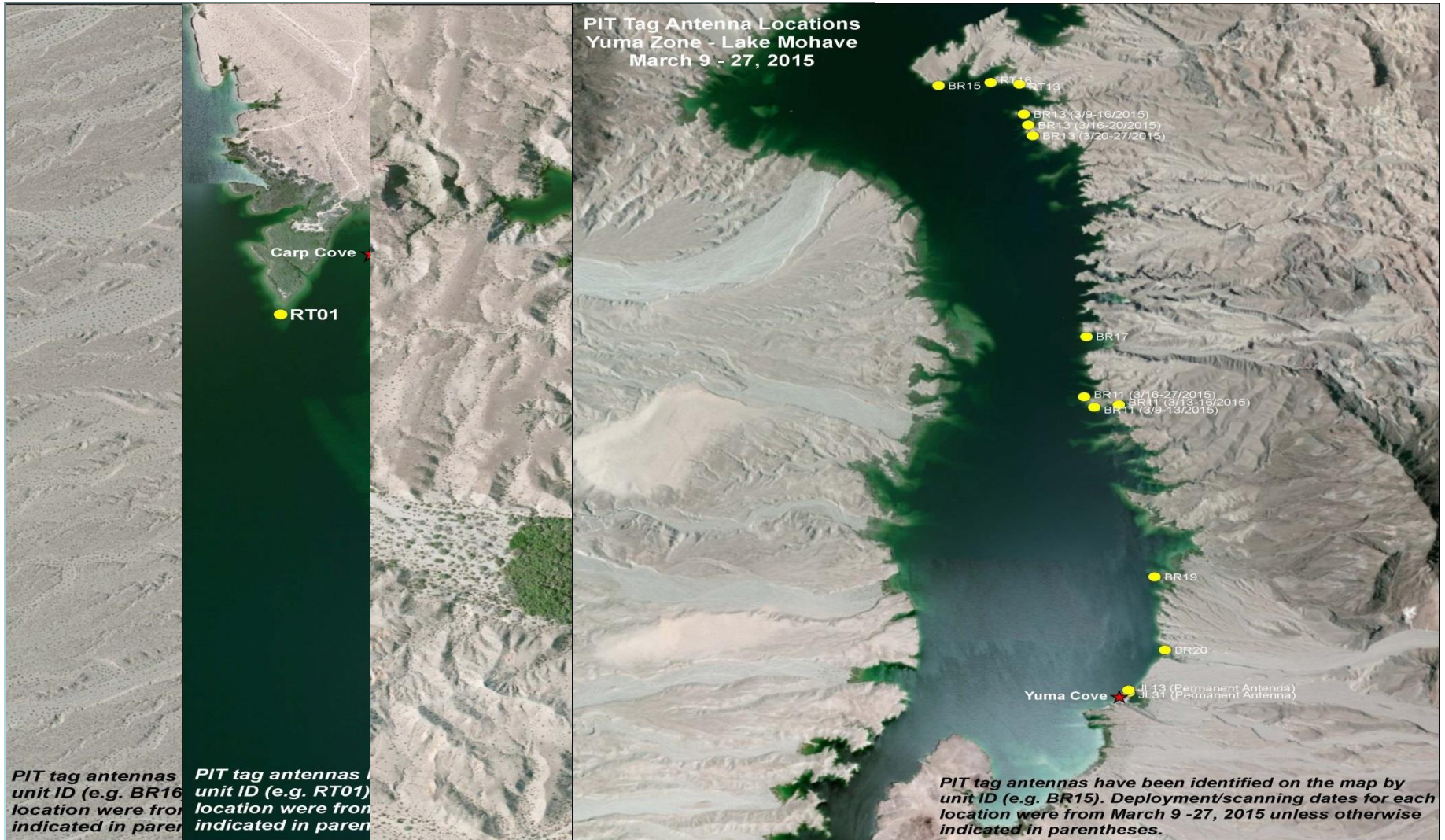
- 22 mobile and 3 permanent scanning units were deployed in four areas of the lake from March 9-27, 2015
- 20 mobile and 5 permanent scanning units were deployed in four areas of the lake from March 7-25, 2016



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 and 4 total download periods from 2015 and 2016 respectively)
- Same-year population estimates were examined by comparing several closed population methods (2015)
- Recaptures were defined as being separated by at least one download period
- Population estimate for 2016 is based on data from the 2015 and 2016 study scanning periods

Results



2015 Summary (Roundup Week Only)

- 185 unique PIT tags scanned
- 139 total net captures (excludes same week recaps)
- 31 fish both scanned and netted
- 293 unique fish contacted and captured
- 10.6% scanned and netted, 52.5% scanned only, 36.9% net only
- 28 400 kHz/no tag captures (20% of net caps, 9.5% of total)
- Revised total available for scanning (134 kHz only): 265 fish
- 11.7% of 134 kHz tagged fish were scanned and netted

2015 Summary (Full season scanning)

- 66/111 (59.5%) 134 kHz net captures were scanned during the full scanning season
- Without netting efforts, 73 unique fish would not have been sampled during 2015

Results



2016 Summary (Roundup Week Only)

- 256 unique PIT tags scanned
- 89 total net captures (excludes same week recaps)
- 42 fish both scanned and netted
- 303 unique fish contacted and captured
- 13.9% scanned and netted, 70.6% scanned only, 15.5% net only
- 17 400 kHz/no tag captures (19% of net capture, 5.6% of total)
- Revised total available for scanning (134 kHz only): 286 fish
- 14.7% of 134 kHz tagged fish were scanned and netted

2016 Summary (Full season scanning)

- 66/72 (91.6%) 134 kHz net captures were scanned during the full scanning season
- Without netting efforts, 23 unique fish would not have been sampled during 2015

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 |

Results



Multi-Year Population Estimates

Table 1. Repatriate razorback sucker population estimate for 2016, based on field data from all of March and using annual single census population estimate, N^* (Chapman modification of the modified Peterson method; Seber 1973). [Pacey 2016]

| Data Years | N^* | 95 % Confidence Interval | |
|------------|-------|--------------------------|-------|
| | | Lower | Upper |
| 2015/2016 | 1,707 | 603 | 3,897 |

Table 2. Repatriate razorback sucker population estimate for 2016, based on data from March scanning study periods, N_c (Chapman modification of the Lincoln-Peterson model [Seber 1973]).

| Data Years | N_c | 95 % Confidence Interval | |
|------------|-------|--------------------------|-------|
| | | Lower | Upper |
| 2015/2016 | 1,259 | 1,091 | 1,453 |

Questions and Discussion



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