POST-STOCKING FATE OF RAZORBACK SUCKER IN TOPOCK MARSH, AZ

CHASE EHLO, U.S. FISH AND WILDLIFE SERVICE

Razorback Sucker

Federally Endangered (Threatened)

Negative interactions with nonnative aquatic species and habitat alterations

Little if any recruitment

Exist solely through an intensive stocking program below Hoover Dam

Topock Marsh

A large backwater (1618 hectares) adjacent to the Colorado River located on the Havasu National Wildlife Refuge.

Created from a historic river meanders controlled by outlet gates on the South Dike

Encompasses a diverse array of habitats (open water, cattails, river channels, flooded timber)

In 2010, approximately 3000 Razorback Sucker were stocked into Topock Marsh

Tracking

Active tracking occurred with a directional hydrophone and omni-directional towable hydrophone

A series of 8 SURs were placed in the Marsh and downloaded monthly

Telemetry Contacts

Passive Contacts

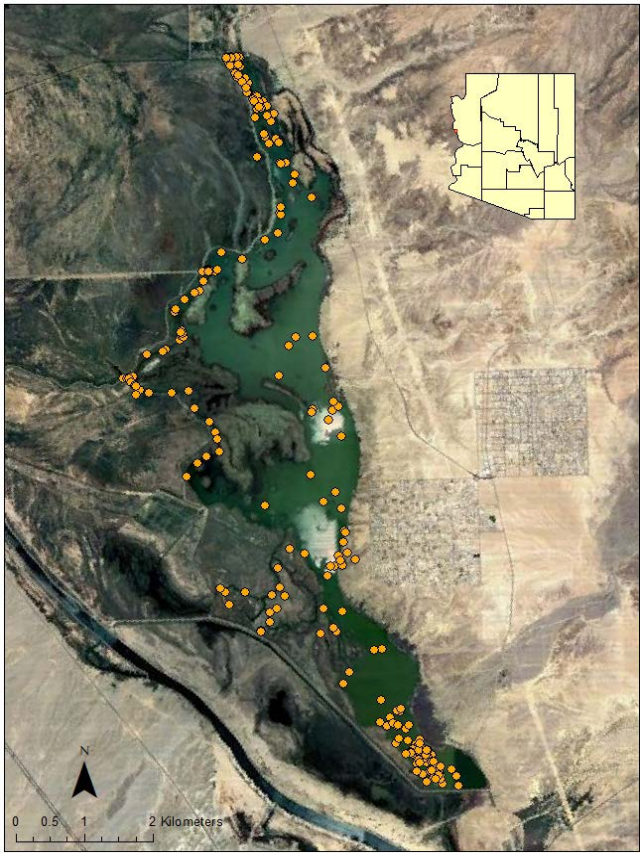
- 703,511 contacts of all 40 fish on all 8 SURs

Active Contacts

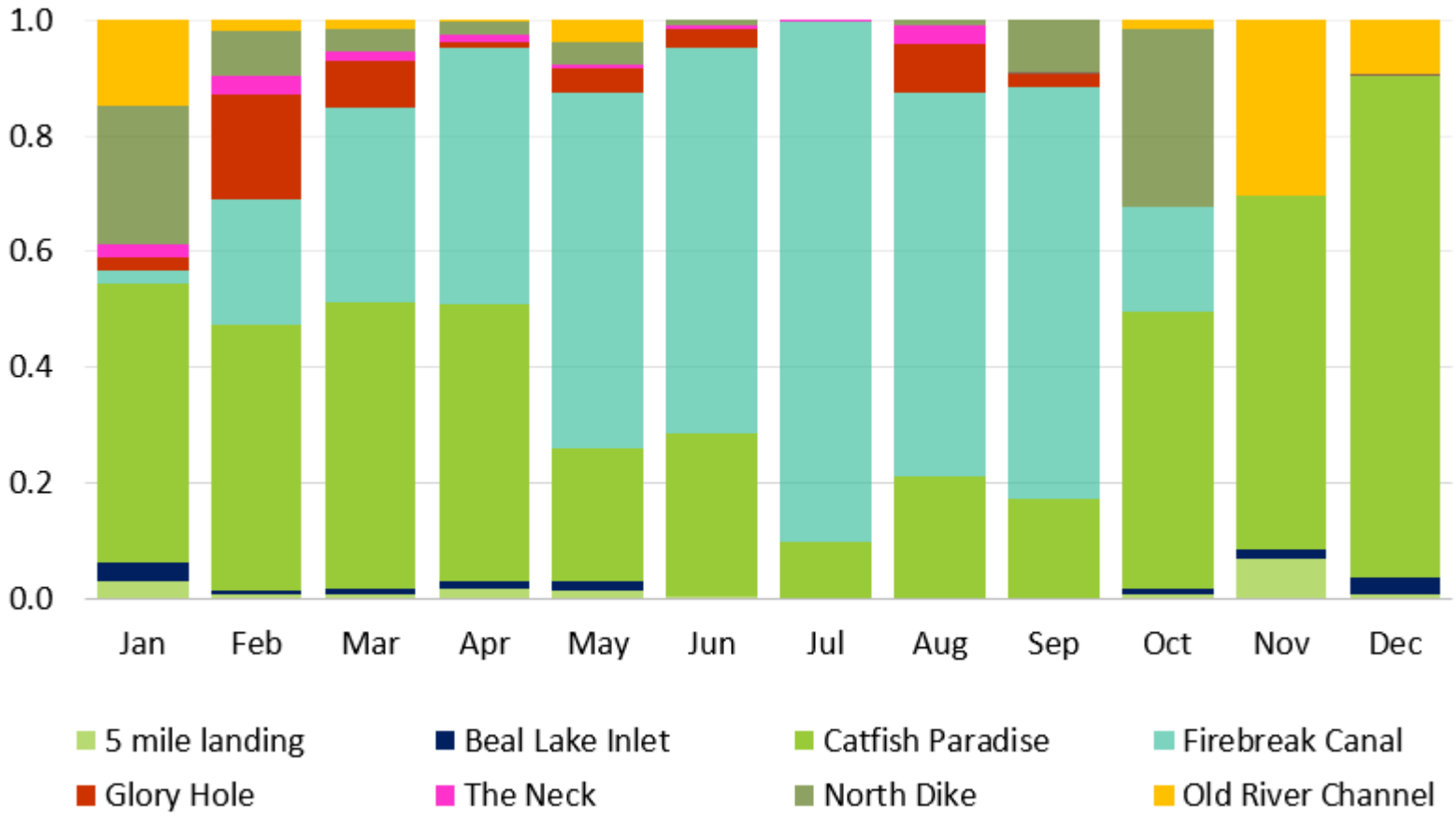
- 307 contacts and 39 of the 40 fish

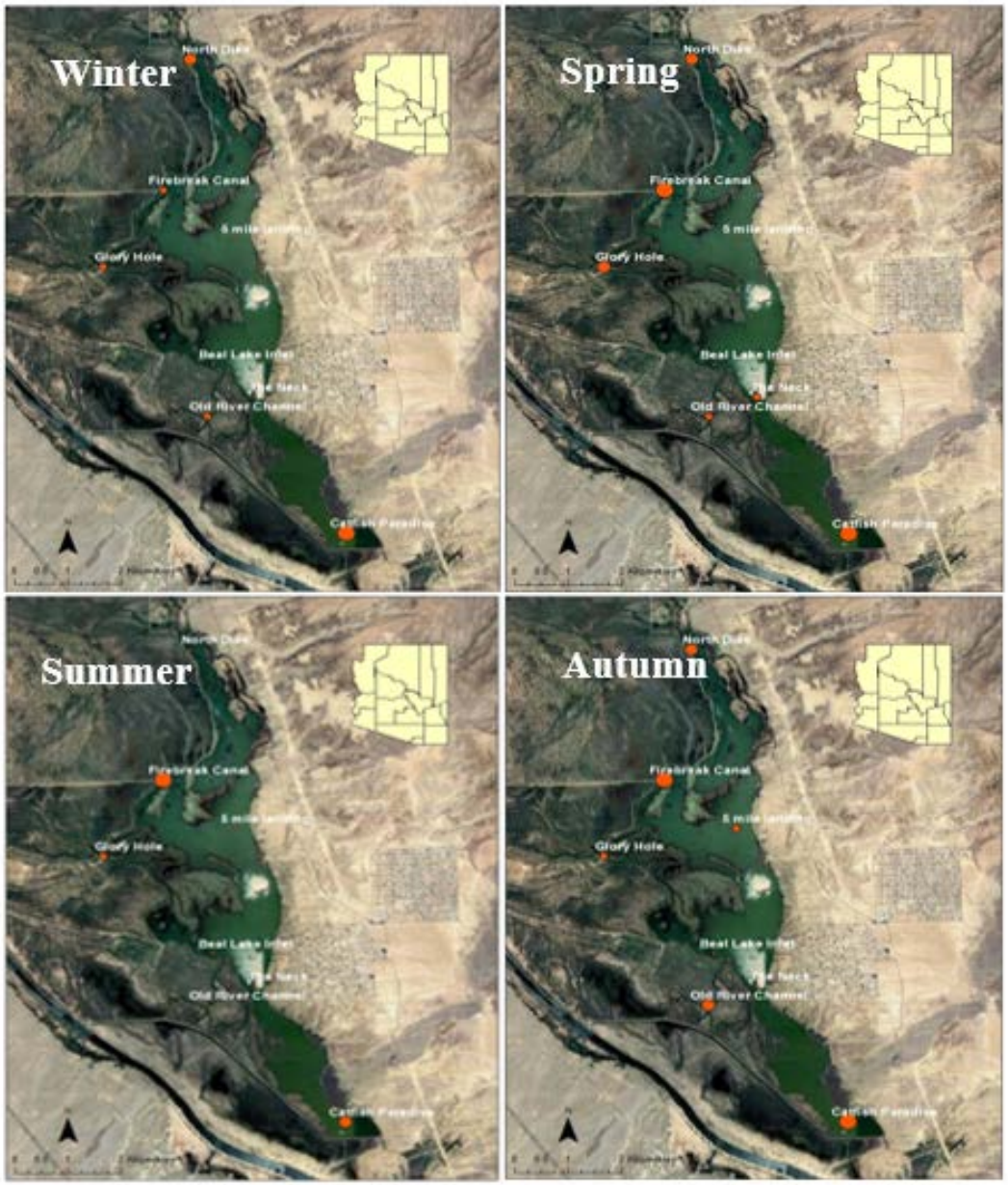
Majority of the contacts occurred in the first half of the study

Active Tracking Contacts



SUR Relative Contacts



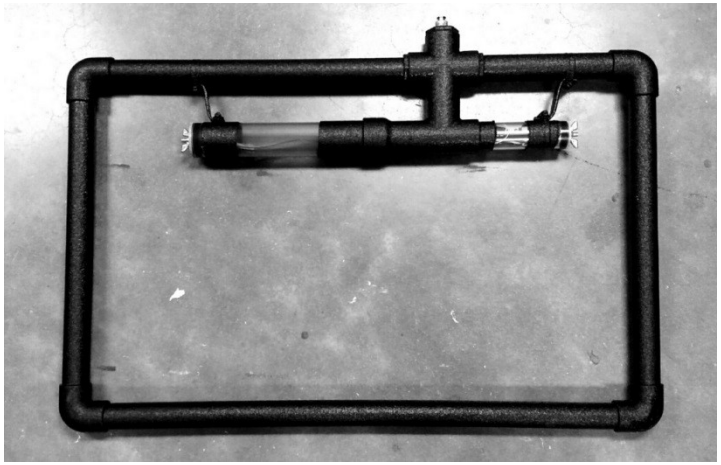

Winter
Spring
Summer
Autumn
North Dike
Firebreak Canal
5 mile inlet
Goofy Hole
Beal Lake Inlet
Neck
Old River Channel
Catfish Paradise

Remote PIT scanning

Scanners varied in size from 1.2 meter (m) x 0.6 m to 0.9 m x 0.6 m.

Deployed in known ‘hot spots’ from the tracking efforts

A total of 5 individual scanning trips in 2017, 2 scanning trips in 2018, and 1 scanning trip in 2019



Stockings

Focused on 3 significant Stocking events in Topock Marsh:

- 3242 Razorback Sucker at a mean length of 349 mm in January 2010.
- 283 Razorback Sucker at a mean length of 395 mm in December 2016.
- 917 Razorback Sucker at a mean length of 369 mm in May 2017.

An additional 397 Razorback Sucker at a mean length of 401 mm were released in October 2018.

*All fish were implanted with PIT tags prior to release.

Mark-Recap

Modified Peterson formula:

$$N^{\wedge *} = \frac{(M+1)(C+1)}{(R+1)}$$

M is the number of fish contacted in the designated mark period (2017).

C is the number of fish contacted in the second period of the paired data (2018)

R is the number of fish contacted in both mark and catch periods for the estimate.

95% CIs were calculated using Poisson approximation tables

*Only on the 3 stockings

Remote PIT scanning summary

Date	Deployments	Total Contacts	Uniques	Scan Time (Hrs)
April 2017	3	2202	149	213
April 2017*	6	1674	145	731
May 2017	5	324	85	706
June 2017	56	3123	324	1202
May 2018	19	801	193	1754
Sept 2018	19	315	45	1779
May 2019	20	1013	189	1974

*One Bonytail contact

Mark-Recap estimates

Stocking Date	2018 (M)	2019 (C)	Recaps	Pop Est. (95% CI)	% of Originally Stocked
1/28/10	153	146	75	**298 (240-379)**	9%
12/9/16	17	4	2	**30 (12-66)**	11%
5/4/17	61	19	3	**310 (136-682)**	34%
Total	231	169	80	**487 (394-618)***	-

*Mark-Recap Estimate for 2018: **800 (652-987)**

Bonytail Telemetry

20 Bonytail were implanted with telemetry tags and released in April 2018.

Immediate post-release tracking contacted 10 of the individuals, one month-post release contacted 8, and subsequent tracking events contacted 0 individuals.

SUR data indicated that at least four fish persisted for one month post-release, and only one had persisted for two months post-release.

Summary

Telemetry fish utilized the whole of Topock Marsh in cooler months and aggregated around the Firebreak Canal in the summer months

Telemetry data allowed for successful deployment of Remote PIT scanners

Mark-recap data suggests that up to 10% of the original stocked population persist in the Marsh over almost a decade post-stocking

Discussion

Marsh et al. (2005) estimated first-year survival of Razorback Sucker was less than 10%

The persistence of the January 2010 fish suggests that first-year survival in Topock Marsh could be higher

- Low sample-size of the May 2017 potentially 34% of that cohort survived post-stocking

Ward et al. (2016) saw evidence that higher turbidity reduced predation pressure on Humpback Chub

- Topock Marsh is a higher turbid system in contrast to the clear oligotrophic water in much of the Colorado River lake basins.

Future?

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