Lower Colorado River Multi-Species Conservation Program

Balancing Resource Use and Conservation

Lake Mohave Razorback Sucker Larval Fish Program

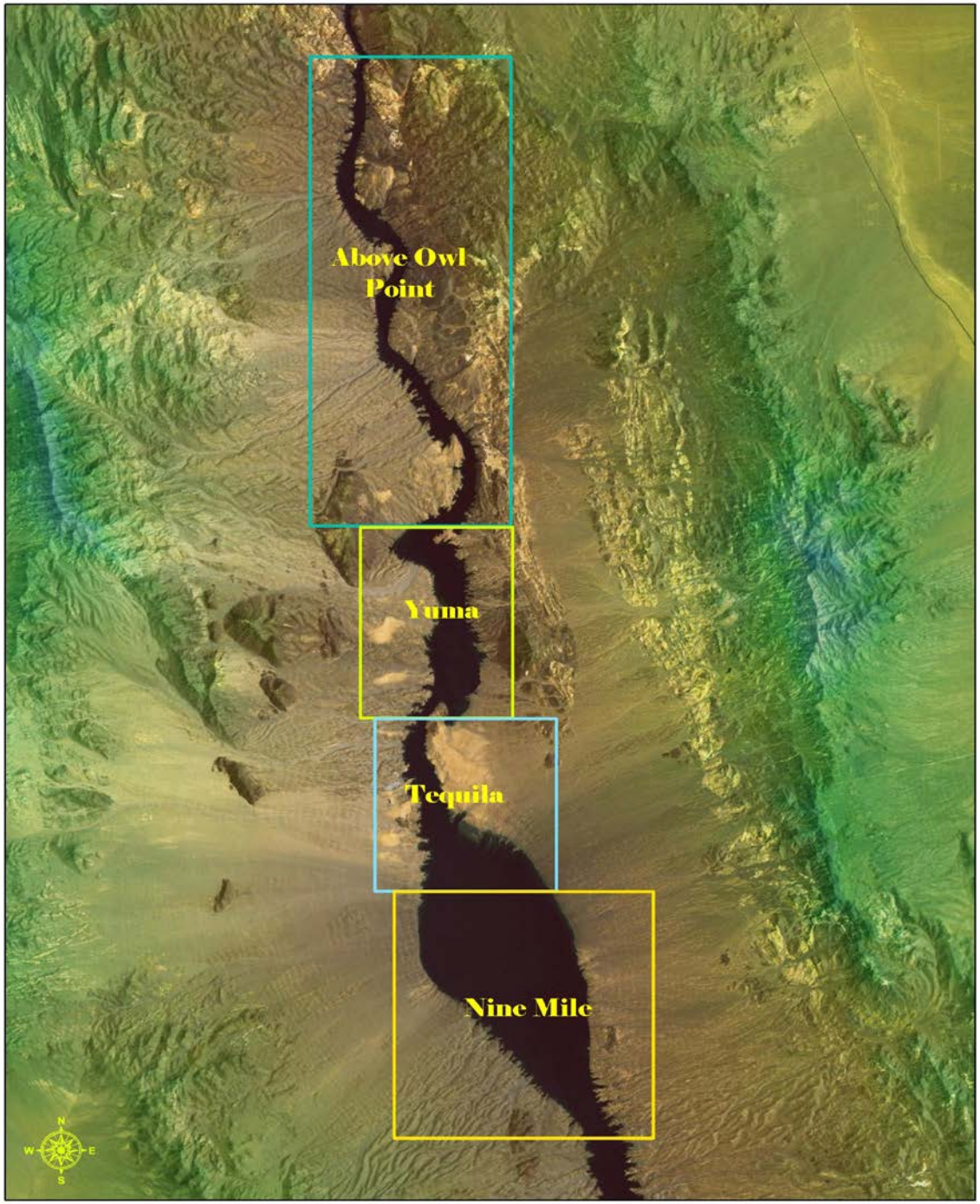
Trish Delrose

History

- Endemic to the Colorado River drainage
- 1:4 main-stem big river fishes in the basin
- Lake Mohave population exceeded 100,000 fish
  - 1991 = 44,000
  - 2001 = fewer than 3,000
  - 2009 = 1,741
  - 2019 = 3,649
- 1991- became federally listed as endangered;
  - decline in the adult populations due to non native fish predation on larvae and habitat alterations from regional water development

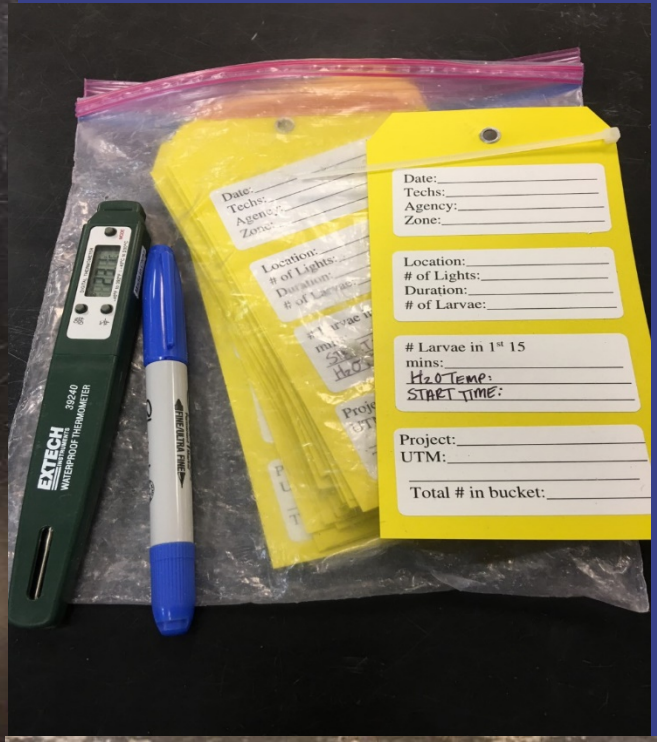
- 1994- the NFWG began larval collections on Lake Mohave
- Used to help rebuild and maintain a genetically diverse adult population
- Goal is to use the repatriated adult population as a brood stock for recovery
- Larvae are reared at WBNFH and LMH and are repatriated back into Lake Mohave
- Collection is a joint effort by federal/state agencies and private entities
- Each January, yearly goals are set by the NFWG and incorporated into the MSCP

- Larvae are collected from late January to the end of April/beginning of May
- Larvae is collected on both the Arizona and Nevada shorelines
- Lake is divided into 4 zones
- In each zone, the collection goals are spread out spatially and temporally to capture the genetic diversity of the adult populations
- Every other week, a subsample of 25 larvae are collected from each zone and sent to Dr. Tom Dowling for genetic analyses.
  - Helps determine if the adult population's genetic diversity is being maintained


Above Owl Point
Yuma
Tequila
Nine Mile
N
W
E
S

Methods

- Gather necessary equipment from the shed at Cottonwood Cove
  - 12 volt car or lithium battery
  - Submersible light: 12v50w Brinkman Q-Beam Starfire II or LED style
  - Aquarium dip net with a wooden dowel attached
  - Buckets and lids
  - Tag bag: tags, zip ties, thermometer, sharpie
- Larval lights are hung off the back of the boat and submerged in the water to attract the larvae
- Larvae display positive phototaxis- they are drawn to a light source



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- As the larvae are drawn to the light, they are dip netted, counted and placed in a bucket.
- Each bucket receives 150 larvae and a data tag.
- The needed information on the larval tag:
  - Date, techs, agency, zone, location, # of lights, duration of collection, # collected, # larvae in the 1st 15 mins, H_20 temp, start time, project, UTM's, and total # in the bucket

- 1994 collections began
- 2005 MSCP began
- Total collected: **983,629 larvae**
- 2020 goal= 30K

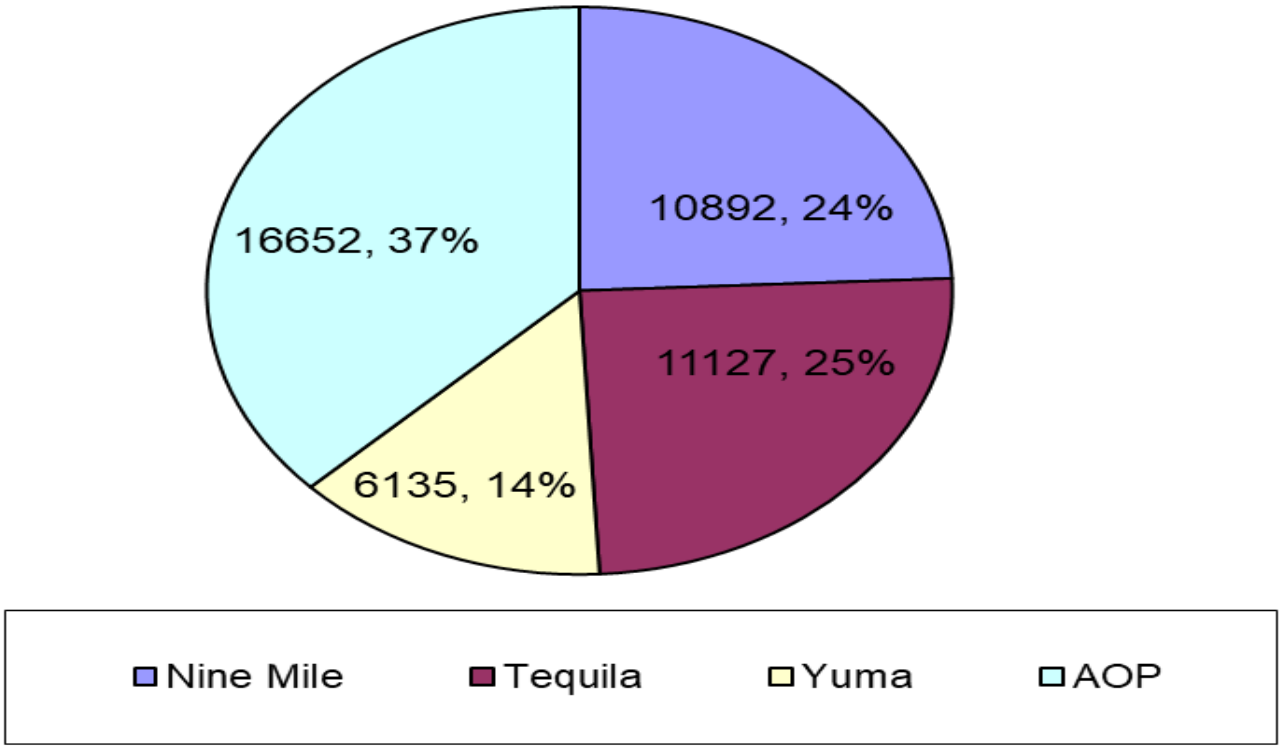
  Over one million larvae will have been collected at the end of the season

YEAR	NINE MILE	TEQUILA	YUMA	AOP	TOTAL
1994	2171	4689	4648	325	11833
1995	2997	11419	3740	1031	19187
1996	4143	33247	18112	12736	68238
1997	16520	45174	20637	26546	108877
1998	4878	17181	19168	7001	48228
1999	4112	36394	45403	5660	91569
2000	14604	18003	18664	3975	55246
2001	4124	8325	8490	3742	24681
2002	4368	4017	4603	2930	15918
2003	8270	8125	10200	1891	28486
2004	6273	6805	6486	5854	25418
2005	18104	27052	14835	521	60512
2006	5949	35400	21729	897	63975
2007	4987	6010	7875	1696	20568
2008	7031	9016	9850	3871	29768
2009	6025	8490	8985	4012	27512
2010	8094	12070	8661	5064	33889
2011	7097	6946	7853	3122	25018
2012	6799	8739	6962	2503	25003
2013	7527	7820	7272	2305	24924
2014	9805	9493	8788	851	28937
2015	3779	4950	5987	3125	17841
2016	5111	5002	5492	2445	18050
2017	8019	7589	12660	6273	34541
2018	8062	7933	8542	6067	30604
2019	10892	6135	11127	16652	44806

2019 Collections by Month

	January	February	March	April	May	Total
Nine Mile	74	1583	8046	1189	0	10,892
Tequila	42	8905	2180	0	0	11,127
Yuma	775	1950	2096	1314	0	6135
AOP	887	1683	2015	12,067	0	16,652
Total	1778	14,121	14,337	14,570	0	**44,806**

2019 Larvae Collection by Zone

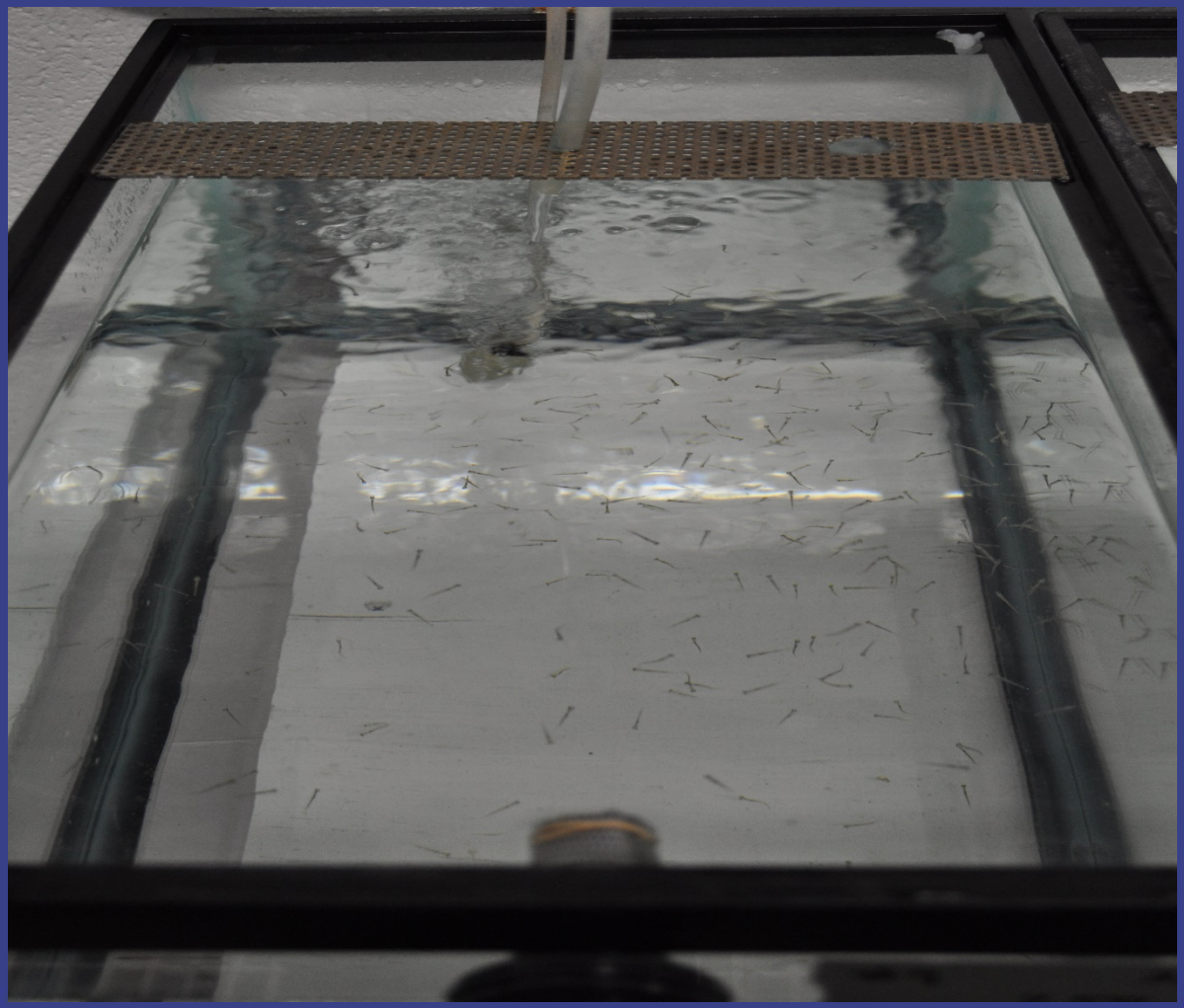


Future of the AOP Zone

- This years effort was focused on finding new locations in the river section near Willow Beach Hatchery.
- Looking for areas where the larvae would get washed into a cove and concentrate in numbers
- Of the 16,652 larvae caught in the AOP zone:
  - 14,645 came from the area around Willow Beach down to Monkey Hole
  - 2007 came from the true AOP Zone
- We need a few more years of data to determine if these locations and numbers are consistent to:
  - Make the river section it's own zone
  - Assign half the goal to this location

2019 Deliveries

- Willow Beach Hatchery: 28,857
- Lake Mead Hatchery: 15,949
- Genetics Samples: 690
- 2020 Goal: 30,000

Questions

- **Thanks to USBR, NDOW, NPS, USFWS, and M&A for all the help collecting larvae over the years!**