An evaluation of tagging mortality and tag retention in age-0 humpback chub, *Gila cypha*

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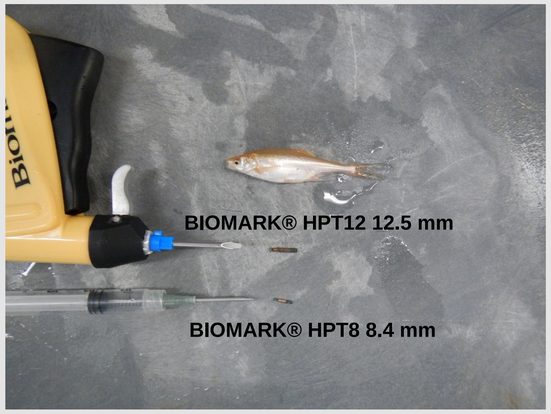
Juvenile humpback chub with a dorsal VIE tag

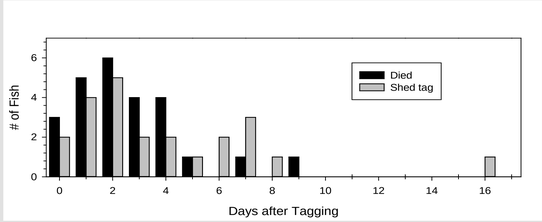
Southwestern Native Aquatic Resources wet lab

Summary

A reliable marking method is needed for age-0 humpback chub *Gila cypha* (<100 mm TL) in Grand Canyon to evaluate movement and growth of this endangered fish at early life history stages. New smaller passive integrated transponder (PIT) tags may allow effective marking at reduced fish sizes, but little is known about potential tag loss or tagging induced mortality in these small fish. We evaluated the smallest size of captive reared humpback chub which could be effectively marked using three different tag types (Biomark® 12.5 mm PIT tags, 134.2 kHz injected into the body cavity with a 12 gauge needle; Biomark®, 8.4 mm , 134.2 KhZ, injected with a 16 gauge needle; and Northwest Marine Technology®, Visible Implant Elastomer (VIE) tags injected under the skin with a 29 gauge needle). Estimates of tag loss, tagging induced mortality, and growth were evaluated for 60 days with each tag type at four different fish sizes: 40-50 mm, 50-60 mm, 60-70 mm and 70-80 mm total length. Mortality at 40-50 mm TL was almost two times higher with 12 mm PIT tags (20 %) than with 8 mm PIT tags (12.5 %) and tag loss was almost 3 times higher with the larger PIT tags (30 %). VIE tagged fish at this size had no mortality but 17.5 % tag loss at the smallest two size classes. These results will be used to determine optimal marking methods for juvenile humpback chub in the Little Colorado River and Colorado River in Grand Canyon.



Sizes of Biomark® PIT tags and needles used

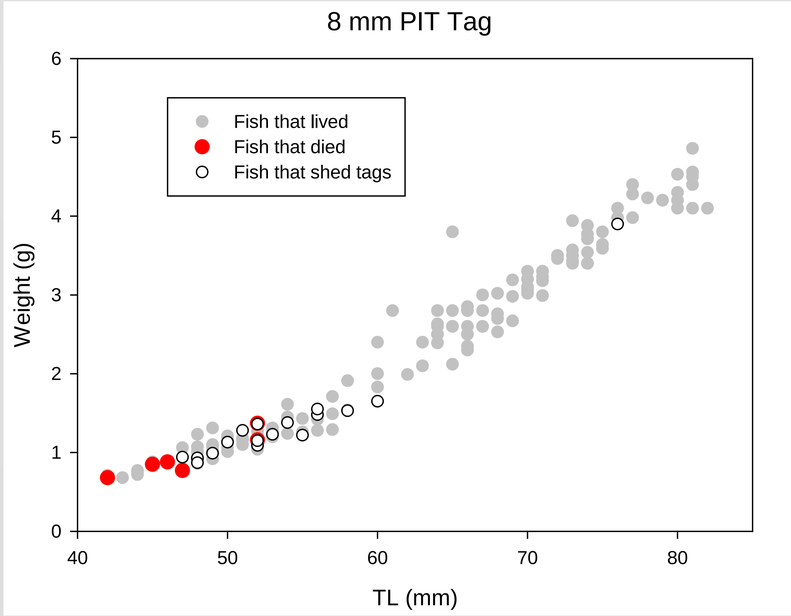


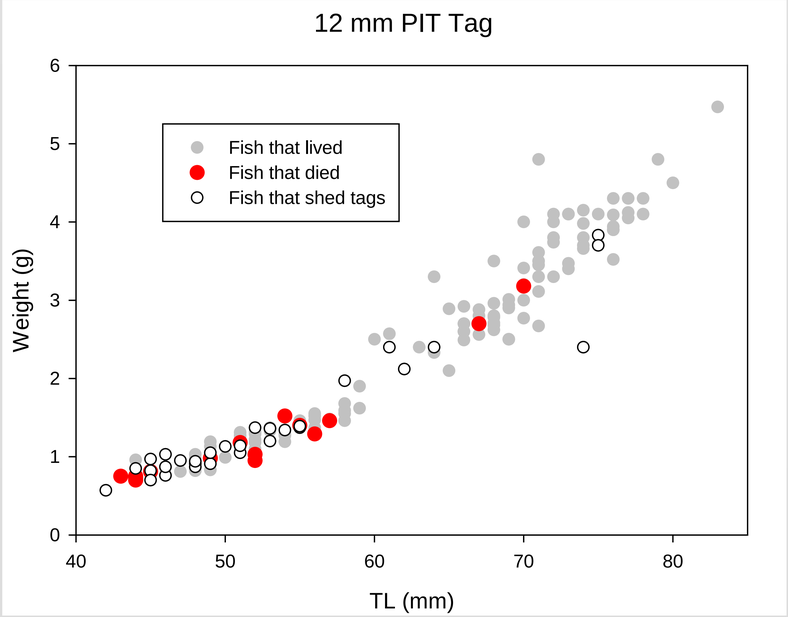
Days after tagging that death or tag loss occurred

Fish Size	Tag Type	# that Died	% that died	# of Shed tags	% of shed tags
40 - 50 mm HBC	8 mm	5	12.5	5	12.5
	12 mm	8	20	12	30
	VIE (2 marks)	0	0	7*	17.5
	Control	0	0	NA	NA
50 - 60 mm HBC	8 mm	3	7.5	10	25
	12 mm	8	20	9	22.5
	VIE (2 marks)	2	5	7*	17.5
	Control	1	2.5	NA	NA
60 - 70 mm HBC	8 mm	0	0	0	0
	12 mm	2	5	5	12.5
	VIE (2 marks)	1	2.5	5*	12.5
	Control	0	0	NA	NA
70 - 80 mm HBC	8 mm	0	0	1	2.5
	12 mm	0	0	2	5
	VIE (2 marks)	0	0	3*	7.5
	Control	0	0	NA	NA

* some VIE tagged fish lost only 1 mark

Results of tagging evaluation for 4 size classes of humpback chub





Sizes of humpback chub that died or shed tags within 60 days

Preliminary Data – Do Not Cite

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