AN EVALUATION OF TAGGING MORTALITY AND TAG RETENTION IN AGE-0 HUMPBACK CHUB, *GILA CYPHA*

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Purpose/Need

- Protocols/Permitting >99mm
- Info gaps
  - 100mm ~ 1-5 year old fish
- Literature
  - Rio Grande silvery minnow > 60mm (Archdeacon et al. 2009)
  - Moapa springfish > 47mm (Dixon & Mesa 2011)
  - Lost River sucker > 72mm (Burdick 2011)
- New 8mm x 1.4mm PIT tag

Study Objective:

- Determine the smallest size that age-0 humpback chub can be effectively PIT tagged with 12.5mm x2mm and 8.4mm x1.4 mm tags.

Approach:

4 size groups

- 40-50mm; 50-60mm
- 60-70mm; 70-80mm

3 treatments/1 control:

12mm; 8mm; VIE

- 40 fish/treatment; 160 fish per size group; 640 total

Fish spawned, reared & implanted at SNARRC

Held w/in size & treatment groups - 60 days

Assessed:

- Mortality, Retention - Daily
- Growth/Weight – Post 60 days
- Logistic Regression, JMP

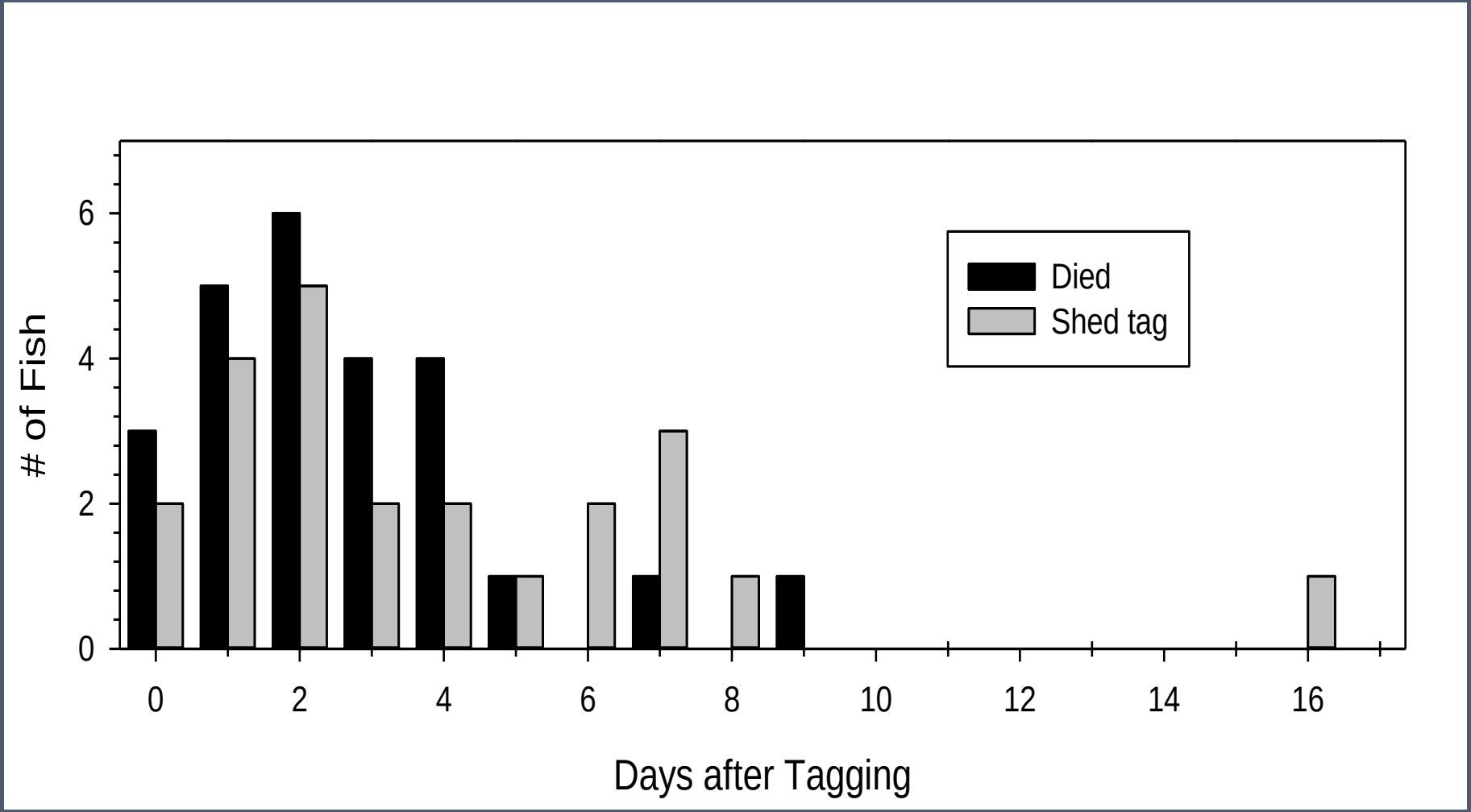
Sizes of Biomark PIT tags and needles used

Dorsal VIE tag

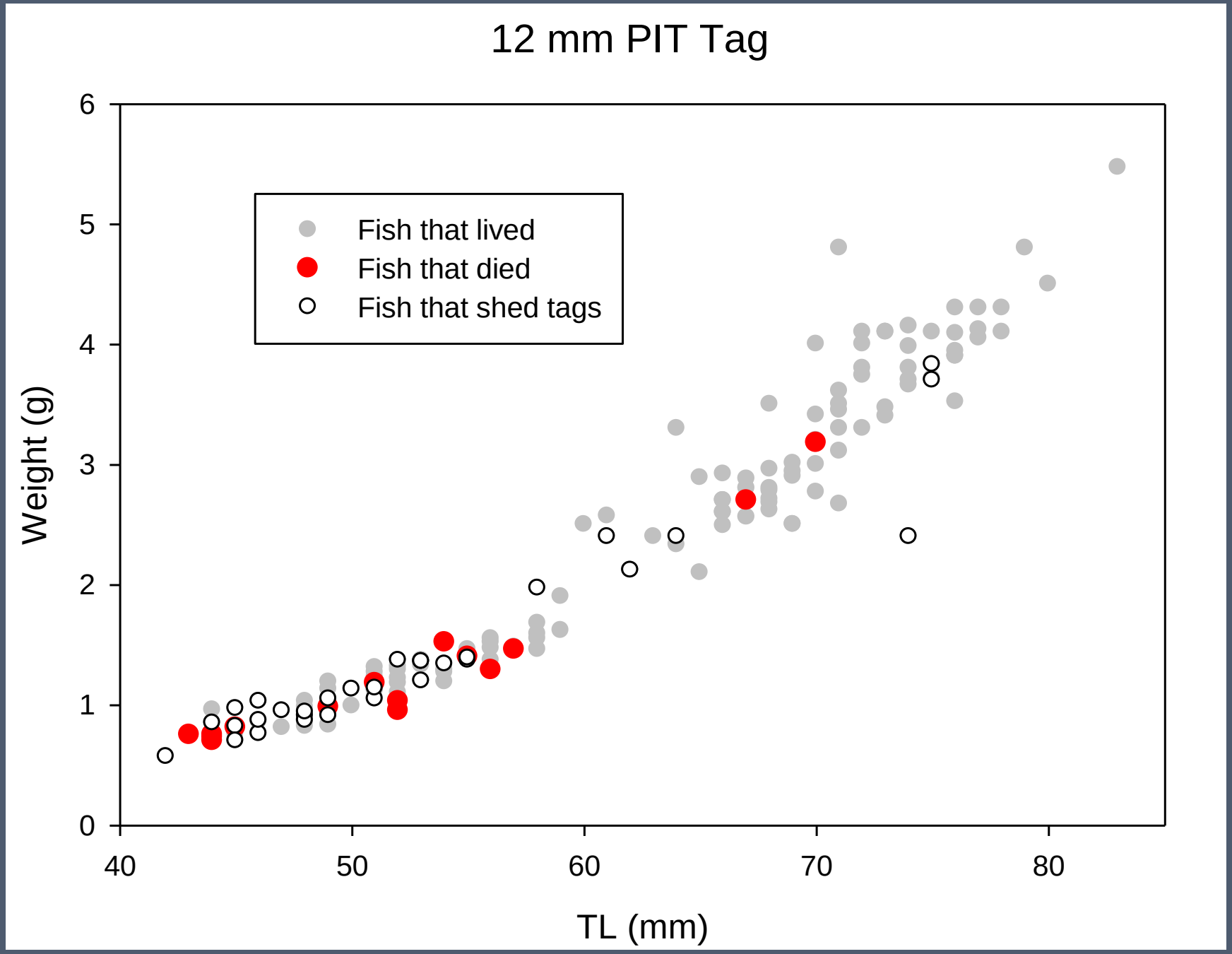
Southwestern Native Aquatic Resources Recovery Center

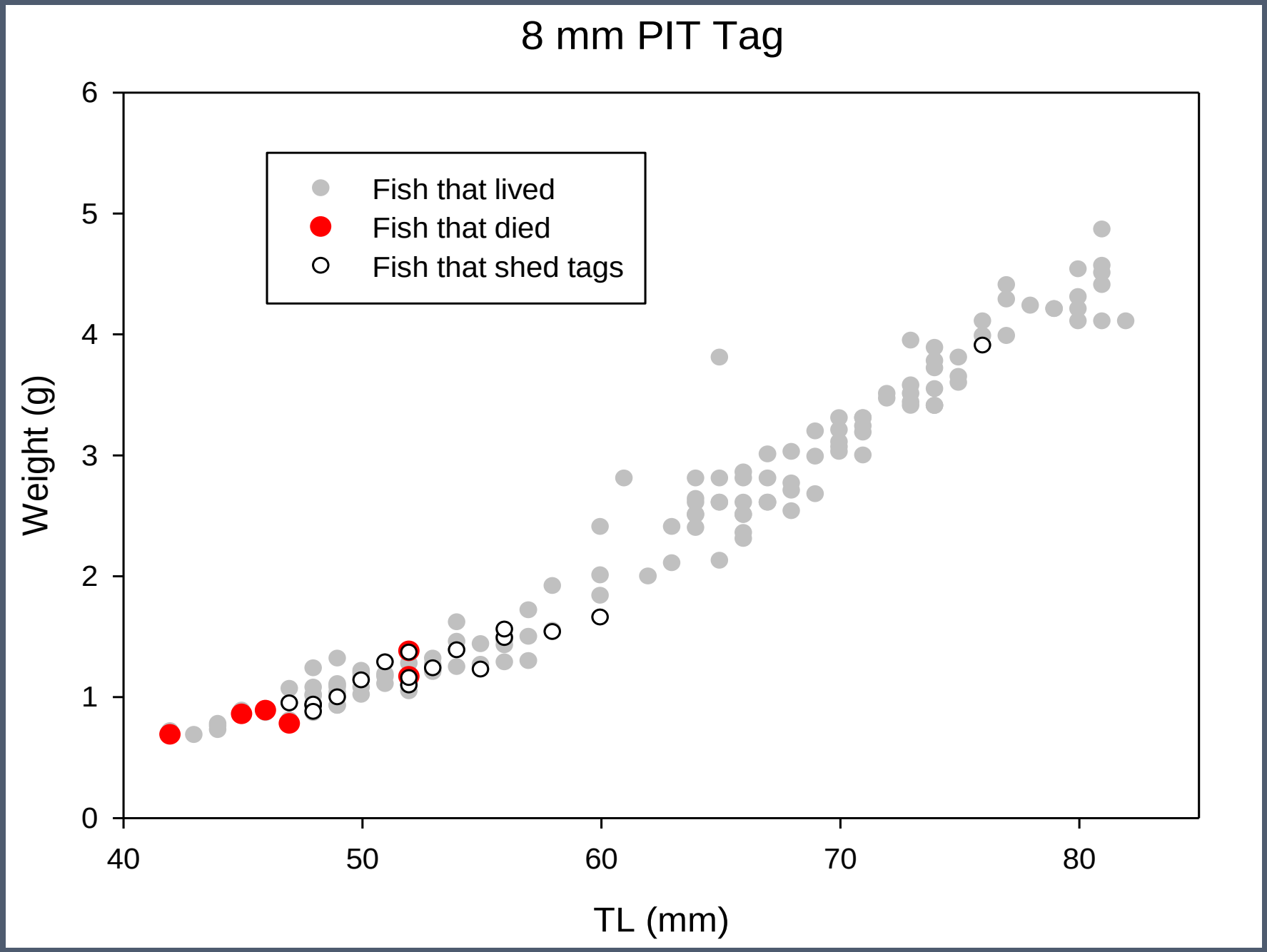
Results:

Shed & Mortality- Temporal

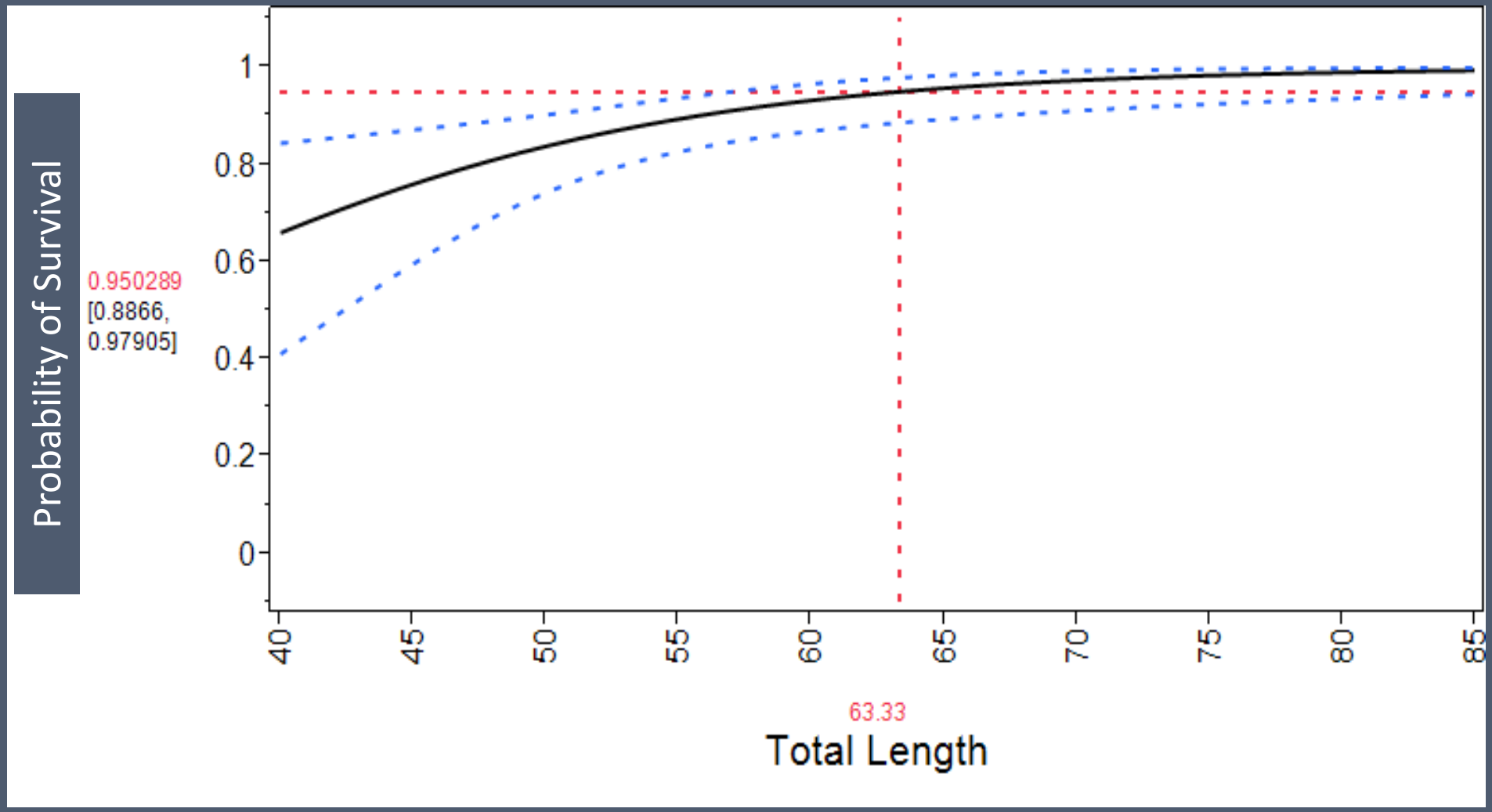


Fish Size	Tag Type	# Died	% Died	# Shed	% Shed
40 - 50 mm HBC	8 mm	5	12.5	5	12.5
	12 mm	8	20	12	30
	VIE (2 marks)	0	0	7*	17.5
	Control	0	0	NA	NA
50 - 60 mm HBC	8 mm	3	7.5	10	25
	12 mm	8	20	9	22.5
	VIE (2 marks)	2	5	7*	17.5
	Control	1	2.5	NA	NA
60 - 70 mm HBC	8 mm	0	0	0	0
	12 mm	2	5	5	12.5
	VIE (2 marks)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

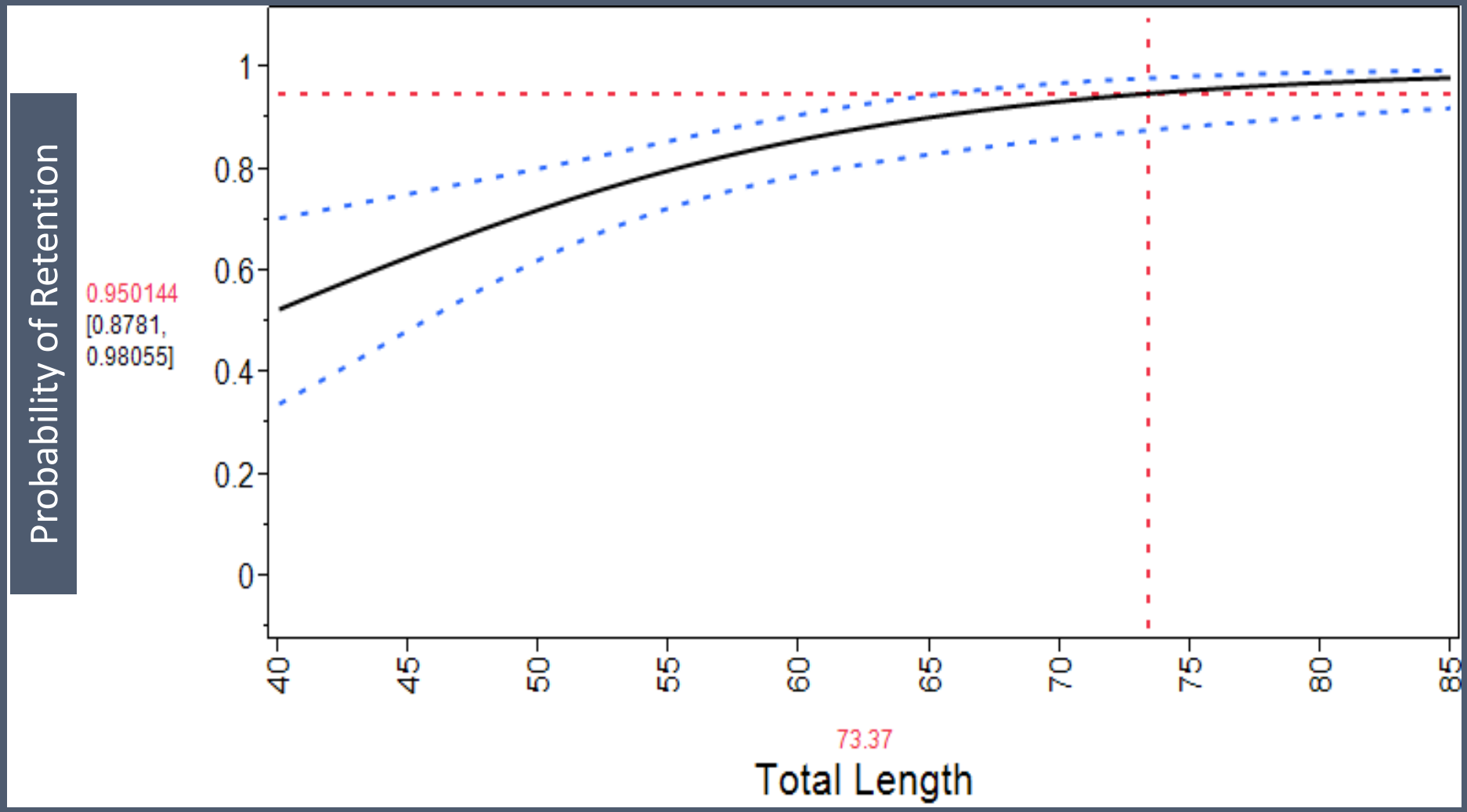

12 mm PIT Tag
Fish that lived
Fish that died
Fish that shed tags
Weight (g)
TL (mm)
0
1
2
3
4
5
6
40
50
60
70
80


8 mm PIT Tag
Fish that lived
Fish that died
Fish that shed tags
Weight (g)
TL (mm)
0
1
2
3
4
5
6
40
50
60
70
80

Probability of Survival - 12 mm PIT tag



Probability of Tag Retention - 12 mm PIT tag



Percent Probability of Survival

Total Length (mm)	8mm PIT	(95 % CI)	12 mm PIT	(95% CI)
45	83	(64 - 93)	76	(60 - 87)
50	94	(86 - 98)	84	(74 - 90)
55	98	(90 - 99)	89	(82 - 94)
60	99	(92 - 100)	93	(87 - 97)
65	99	(93 - 100)	96	(89 - 98)
70	99	(94 - 100)	97	(91 - 99)
75	99	(96 - 100)	98	(92 - 99)
80	100	(96 - 100)	99	(94 - 100)

Percent Probability of Retaining a PIT Tag

Total Length (mm)	8mm PIT	(95 % CI)	12 mm PIT	(95% CI)
45	77	(61 - 87)	63	(49 - 75)
50	83	(74 - 89)	72	(62 - 80)
55	88	(81 - 92)	80	(72 - 86)
60	91	(85 - 95)	86	(79 - 91)
65	94	(88 - 97)	90	(83 - 95)
70	96	(89 - 98)	93	(86 - 97)
75	97	(90 - 99)	96	(88 - 98)
80	98	(91 - 99)	97	(90 - 99)

Considerations & Outcomes

- Ideal environment & Fish were in excellent shape/ body condition - results may differ in field
- 8mm vs. 12mm – tag conflict? still work to do
- VIE tags short-term tag loss higher than expected – location and fast growing fish (temp)
- Will use this information to inform permit limits
- Investigators may use this information to inform PIT tag–based studies
- Management Note – Journal of Fisheries Mgmt.

Thank You