



Recent trends in the Lees Ferry tailwater rainbow trout fishery

Luke Avery

Arizona Game and Fish Department

Research Branch



Project objectives and monitoring strategy

- **Monitor status and trends in RBT population for:**
 - Population abundance and CPUE
 - Population size structure
 - Growth rate
 - Relative condition
 - Whirling disease (samples collected by AGFD & GCMRC since 1999)
- **June 2002 through 2009, 27 random and 9 fixed sites sampled 3 times/year**
- **2010, 36 random sites, only 2 trips**
 - Fish receive Floy tags in random sites (beginning 2007)
 - Fish receive PIT-tags in sites near old fixed sites (beginning 2002)
- **MLFF began in 1991**
- **HFE March 2008**
- **Fall steady flows begin in 2008**





Total Fish Caught

Trip ID	Total catch		
LF20100428	<u>RBT</u>	<u>BNT</u>	<u>FMS</u>
04/27-04/29/2010	849	1	1
LF20101026	<u>RBT</u>	<u>BNT</u>	<u>FMS</u>
10/26-10/28/2010	1404	3	2
Total	2253	4	3
Percent of catch (%)	99.69	0.18	0.13

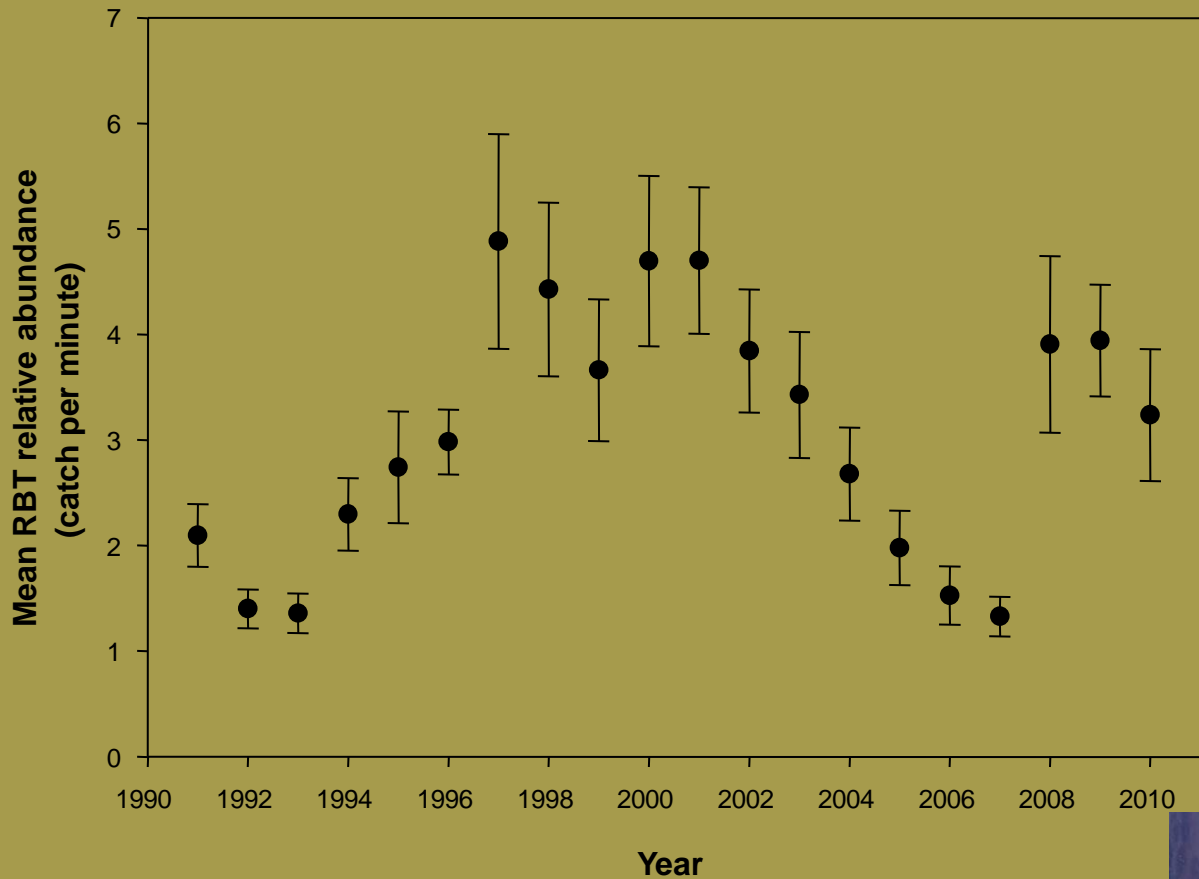


Recaps

Tag type	Species	Tag number	Date marked	Mark location (RM)	Date recaptured	Recap location (RM)	Days out	Mark length (mm)	Recap length (mm)	Distance moved (miles)	Instant growth (mm/day)
<i>Floy tag</i>											
	RBT	AGFD 2016	7/16/2009	-6.7	4/28/2010	-6.64	286	382	382	0.06	0.0000
	RBT	AGFD 2627	11/5/2009	-8.1	4/28/2010	-8	174	223	286	0.1	0.3621
	RBT	AGFD 3130	4/29/2010	-12.6	10/27/2010	-12.6	181	273	304	0	0.1713
<i>PIT tag</i>											
	RBT	43447B0A68	2/29/2008	-14.7	4/29/2010	-14.7	790	152	354	0	0.2557
	RBT	4364012C1C	2/29/2008	-14.7	4/28/2010	-14.62	789	352	369	0.08	0.0215
	FMS	3D9.1BF255FF29	6/14/2006	127.8	10/28/2010	-12.6	1597	269	431	-140.4	0.1014

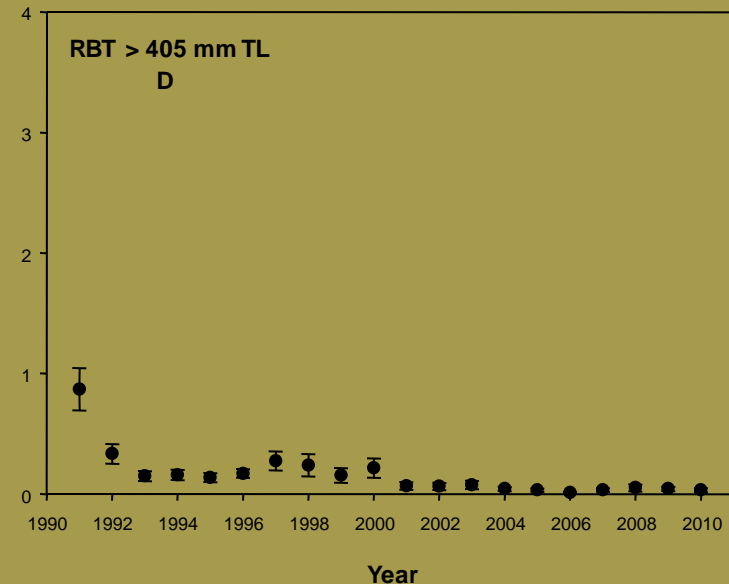
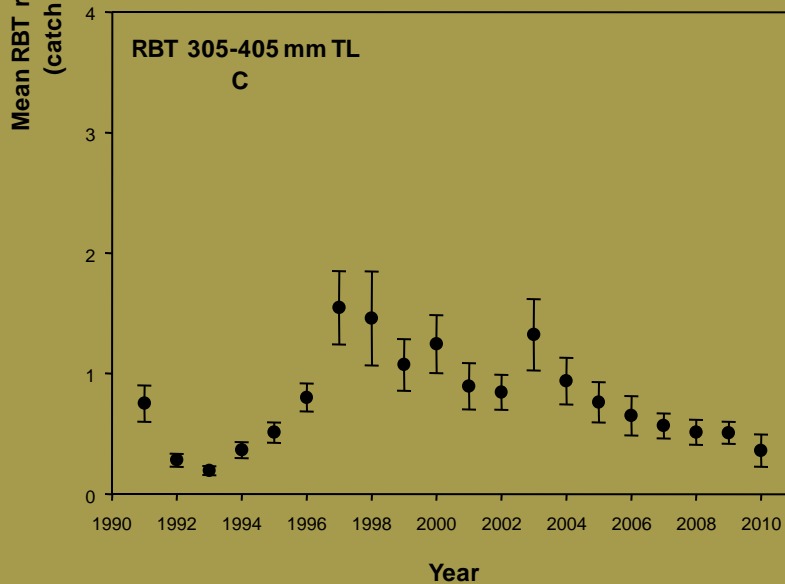
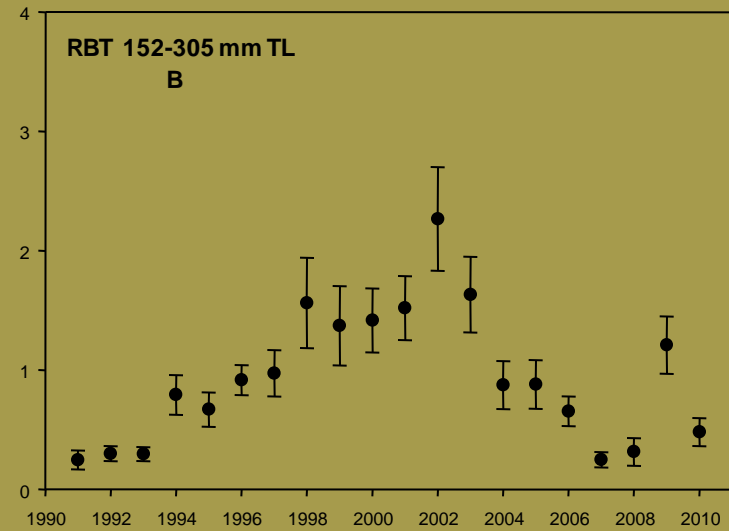
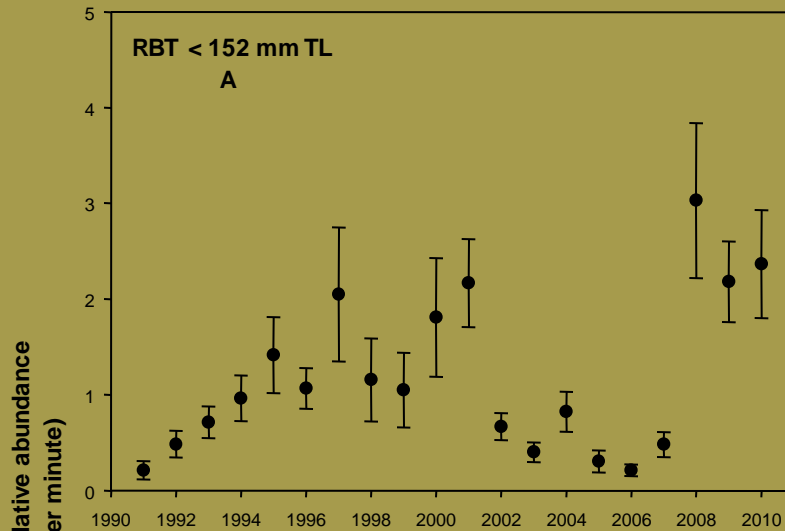


Relative abundance



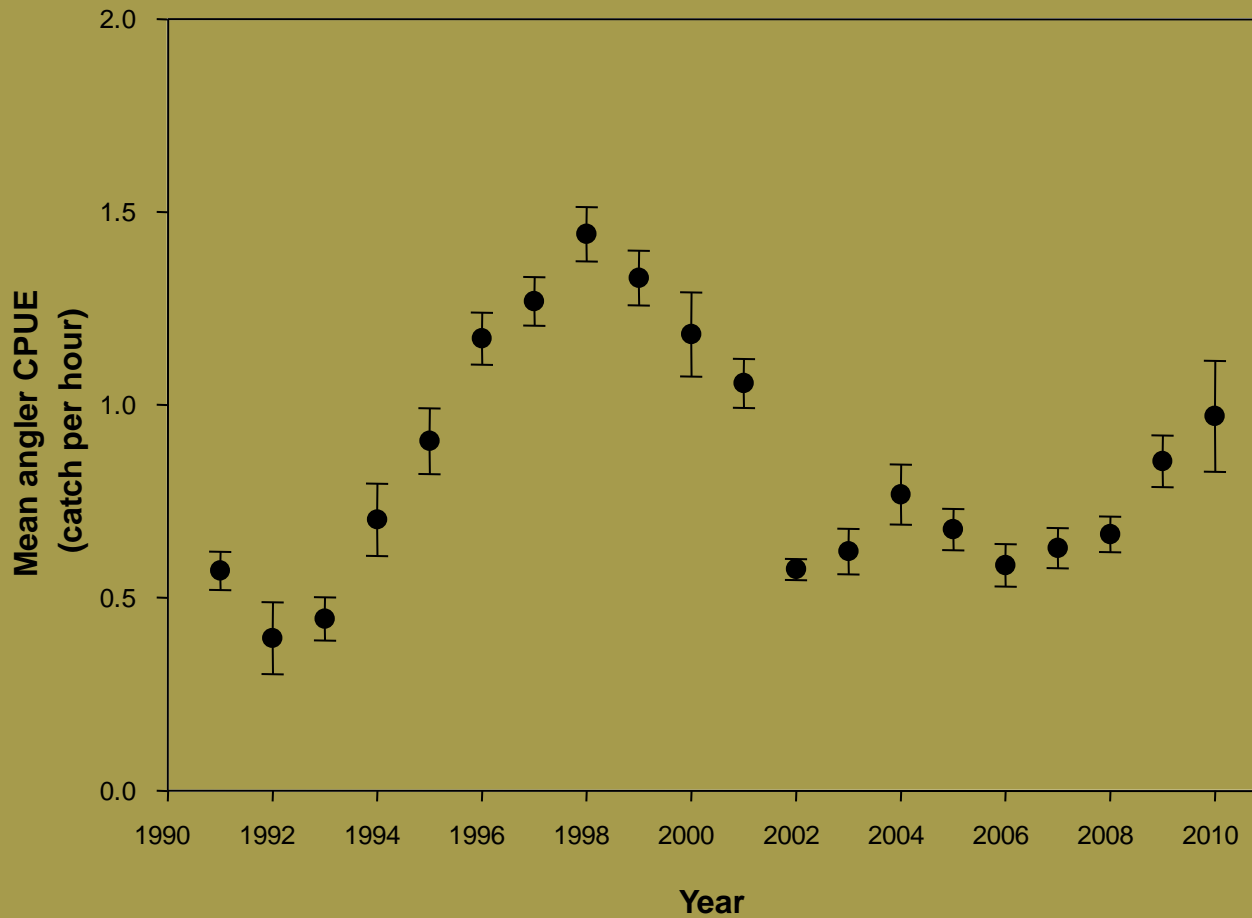


Relative abundance/Size structure



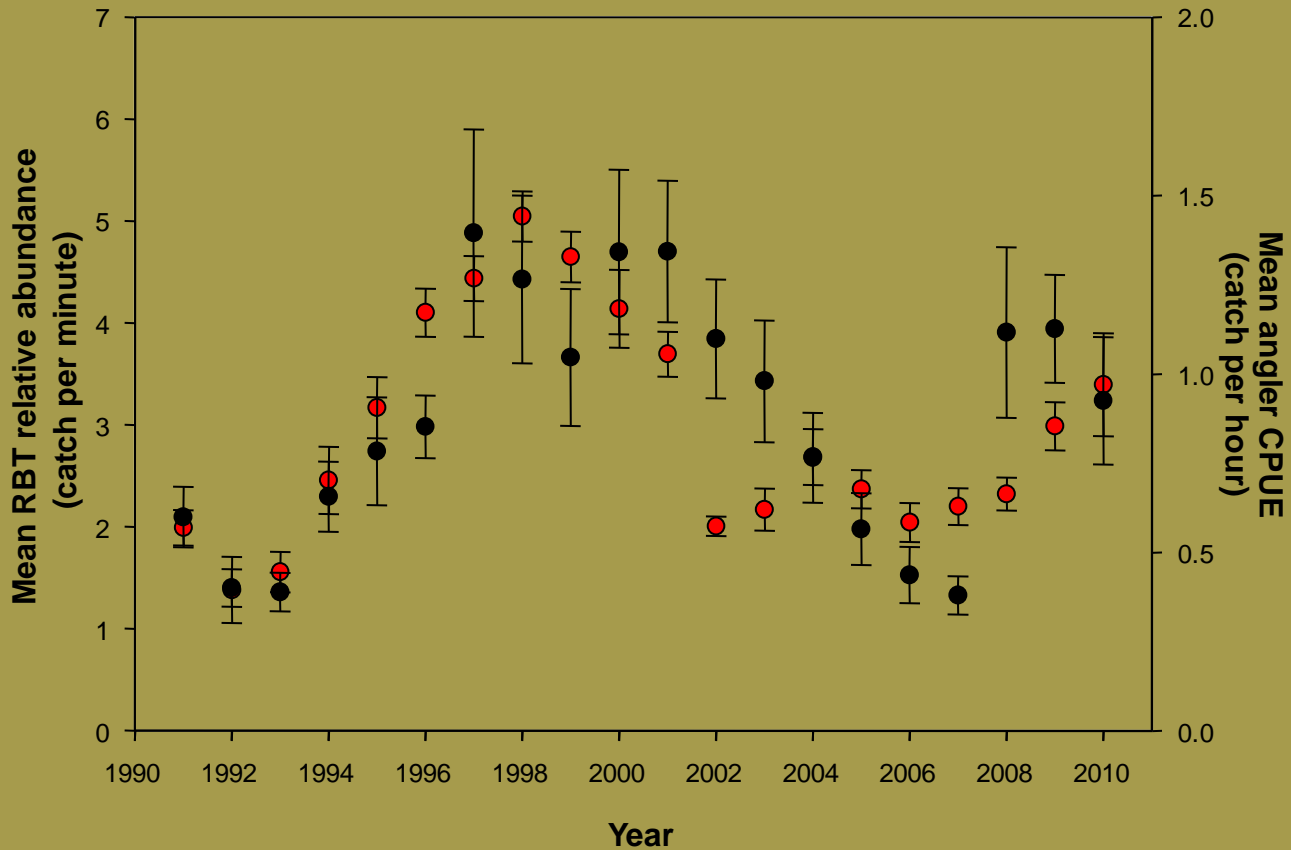


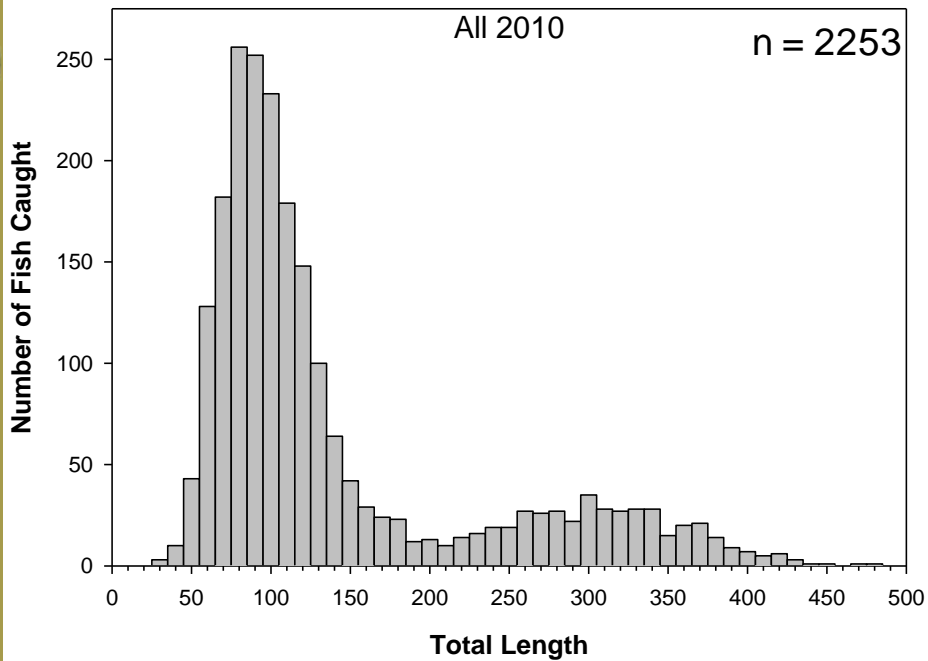
Angler creel survey



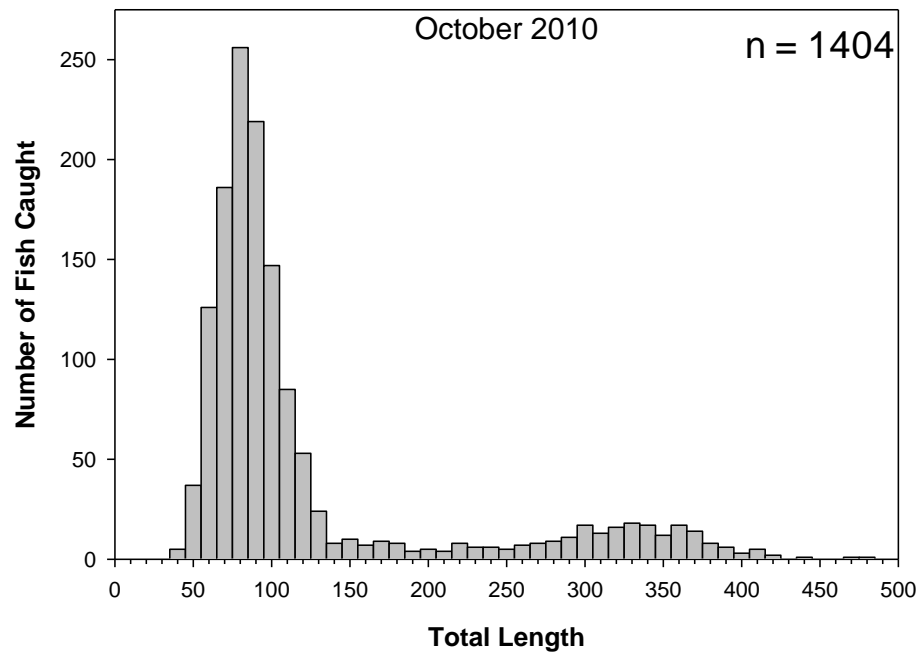
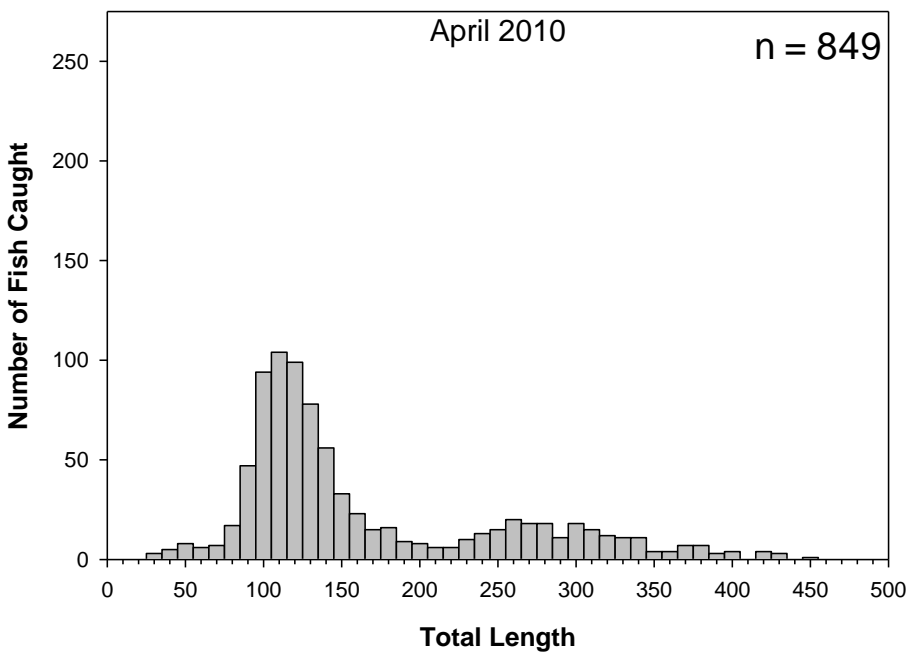


Angler creel survey



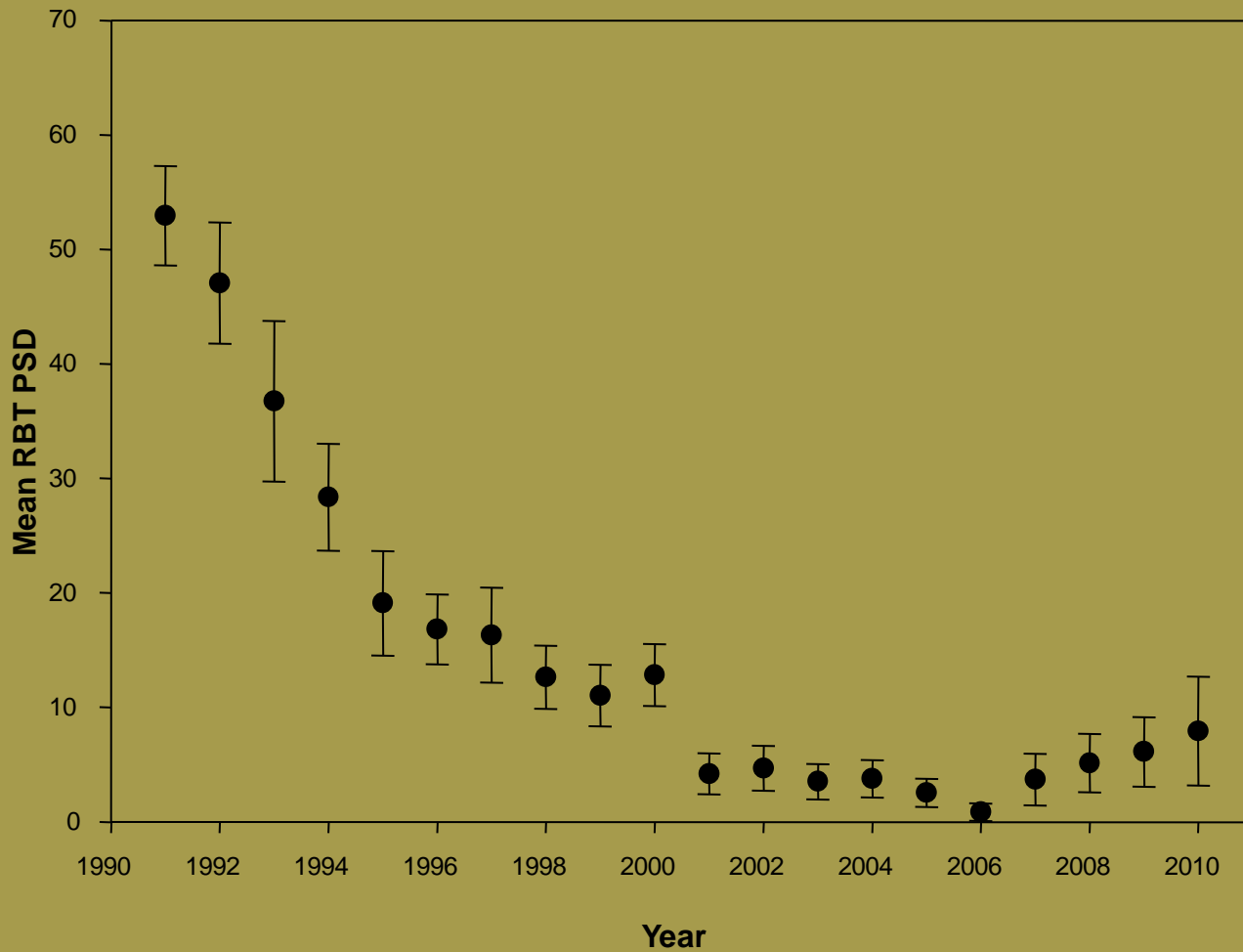


Size structure





Size structure





Size structure

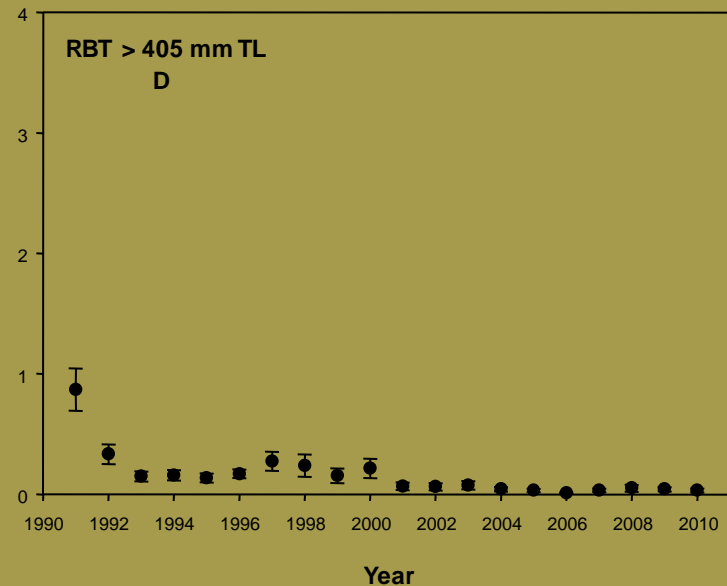
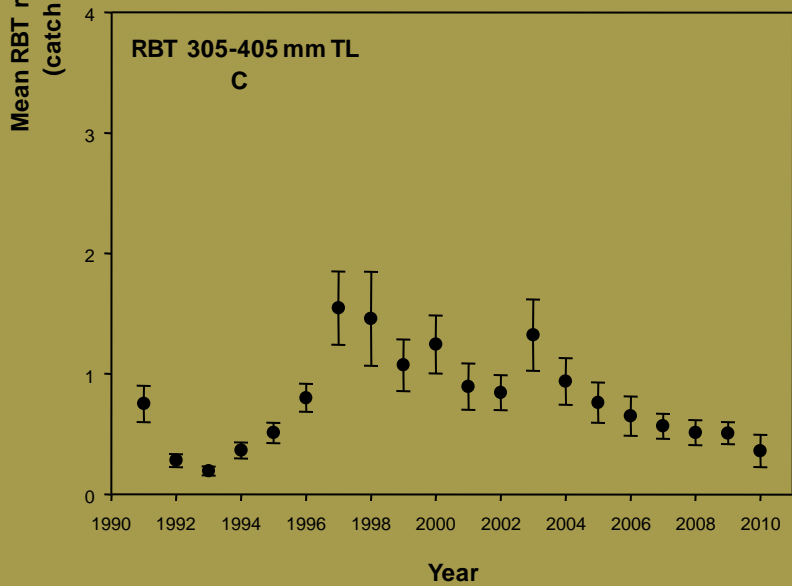
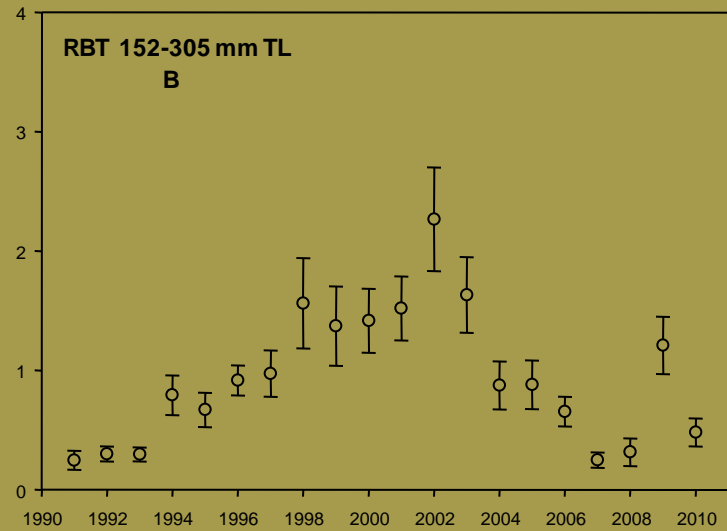
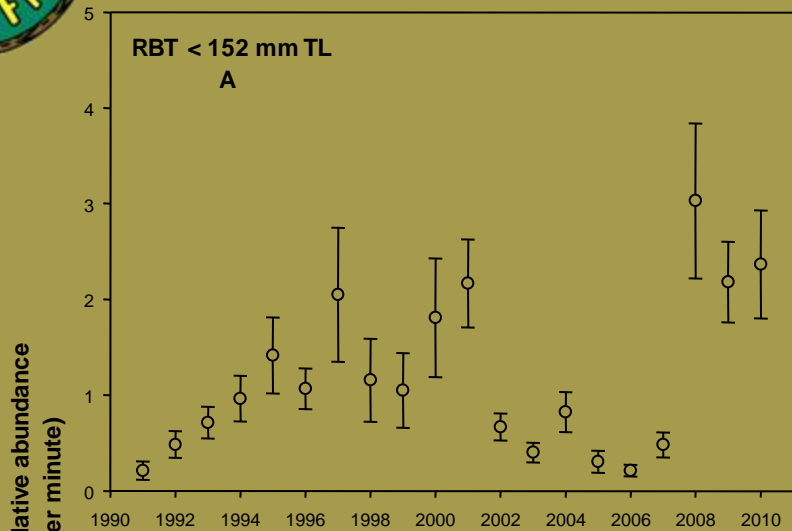
- Is PSD still relevant?

$$PSD = \left(\frac{RBT \geq 406}{RBT \geq 305} \right) * 100$$

- If $RBT \geq 406$ increase in abundance, PSD goes up
- OR, if $RBT 305 - 405$ decrease in abundance, PSD goes up, but it doesn't mean the fish are getting any larger
 - Currently an irrelevant metric?



Relative abundance/Size structure





PSD Alternatives

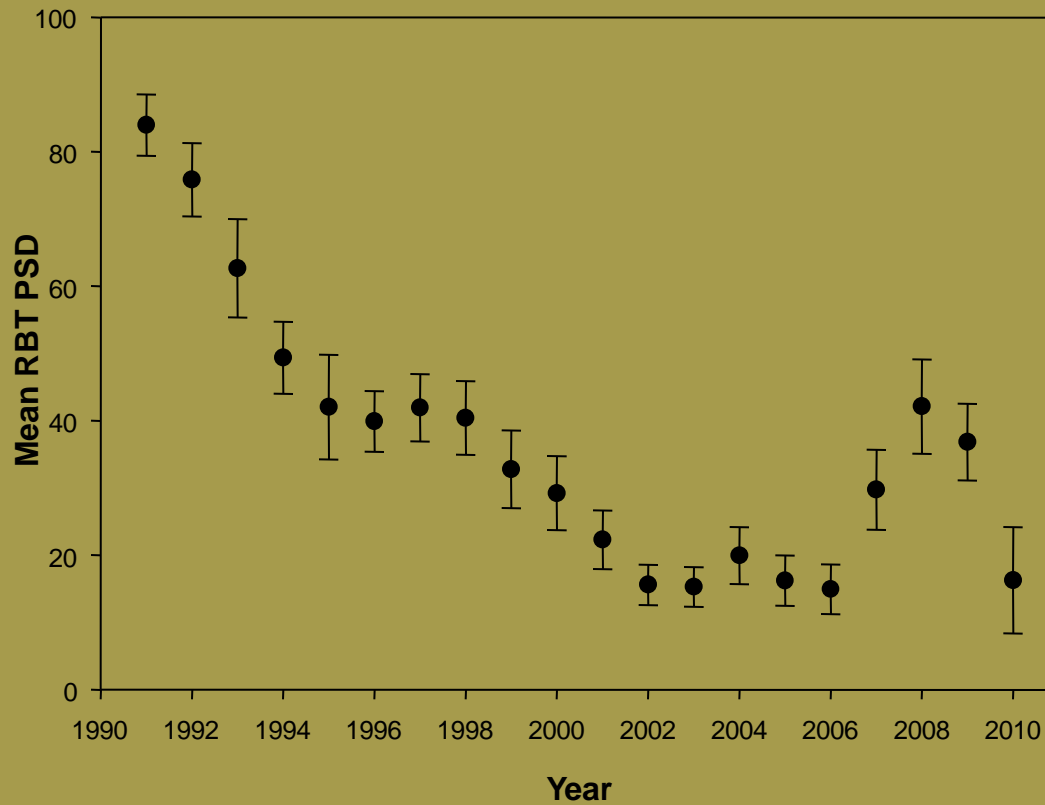
- Change standard length cutoffs

$$PSD = \left(\frac{RBT \geq 356}{RBT \geq 254} \right) * 100$$

- New regulation: ≥ 356 mm (14 inches) must be released (quality)
- 254 mm (10 inches) catchable (stock)

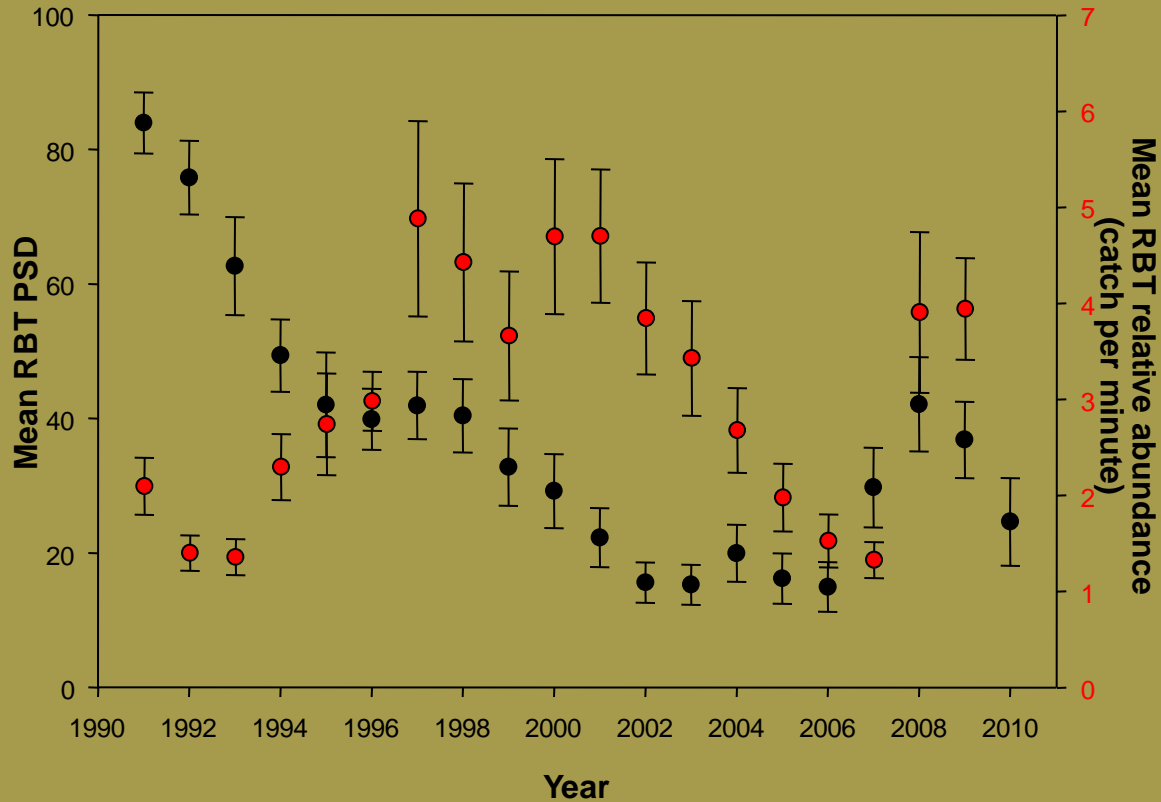


PSD Alternatives



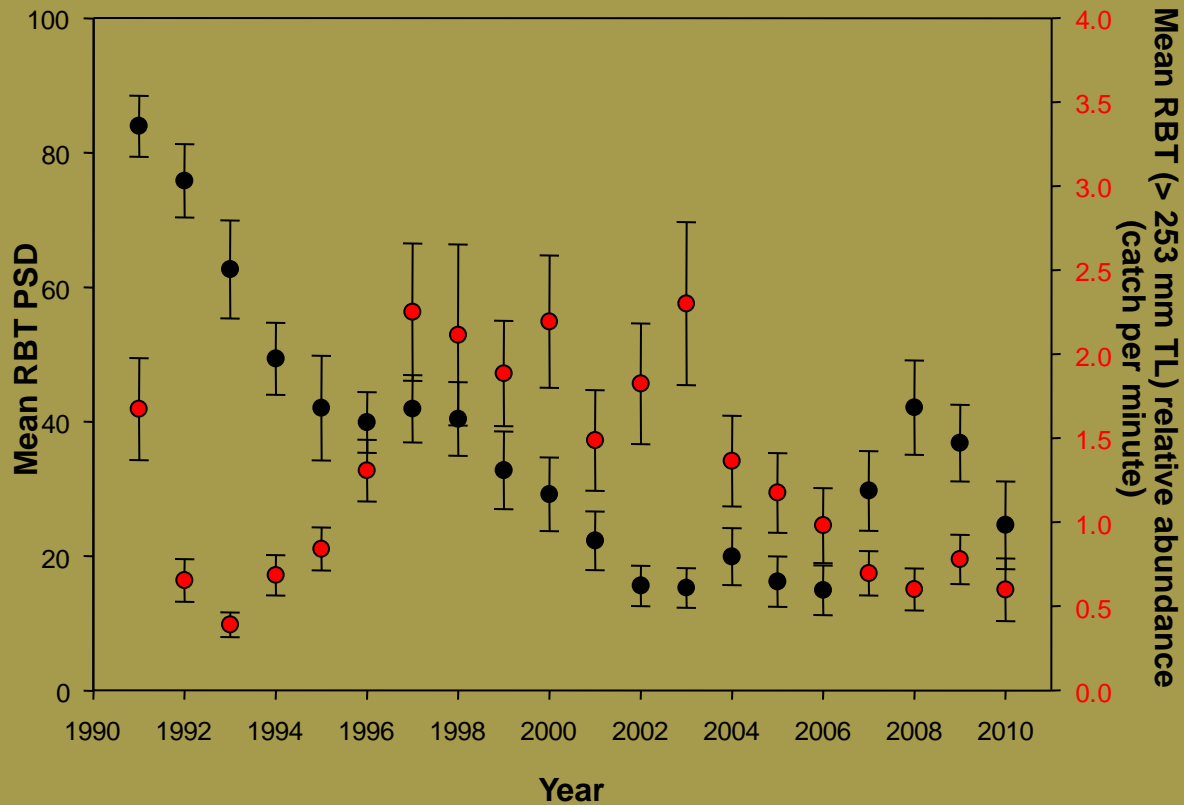


PSD Alternatives



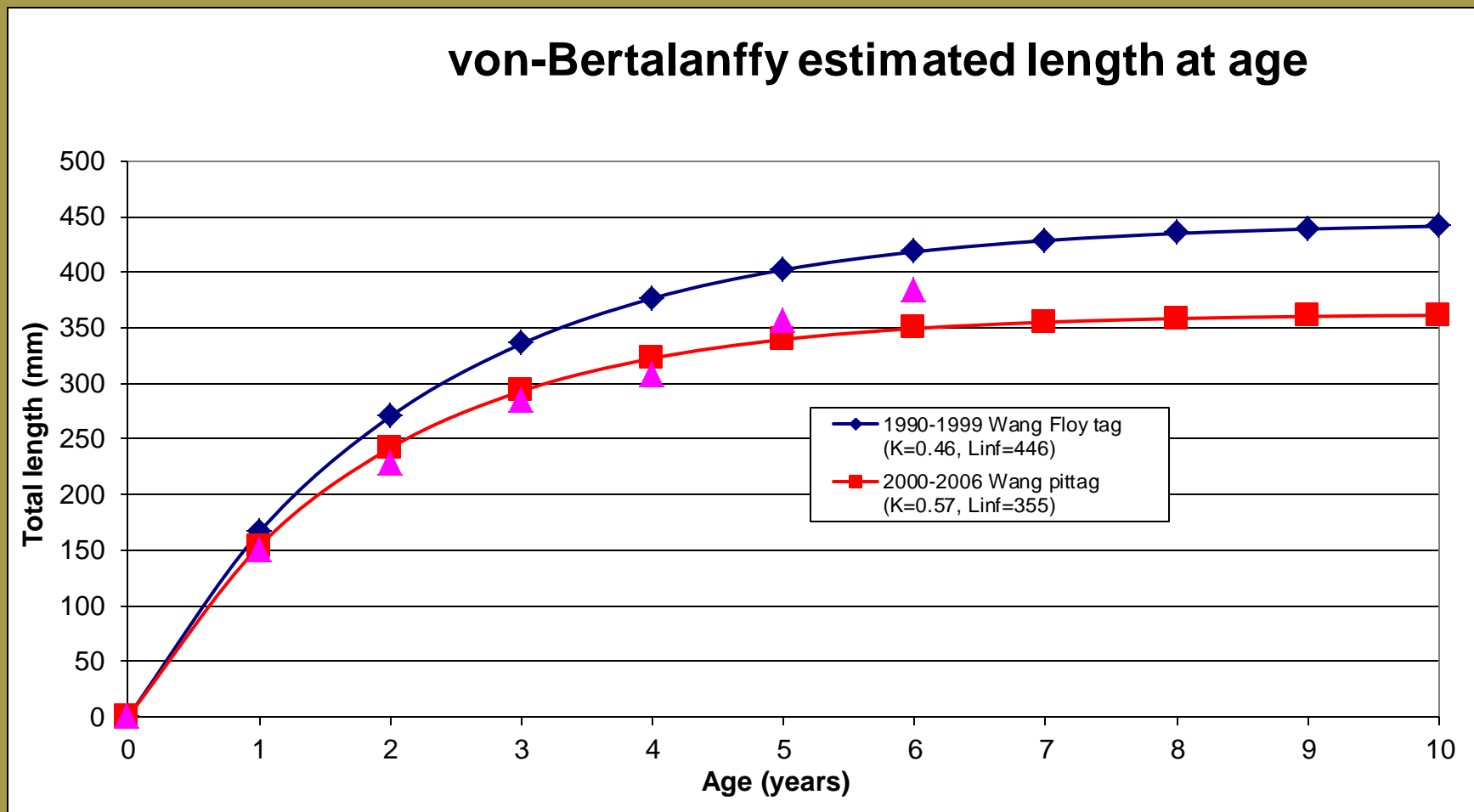


PSD Alternatives





Growth rate





Relative condition

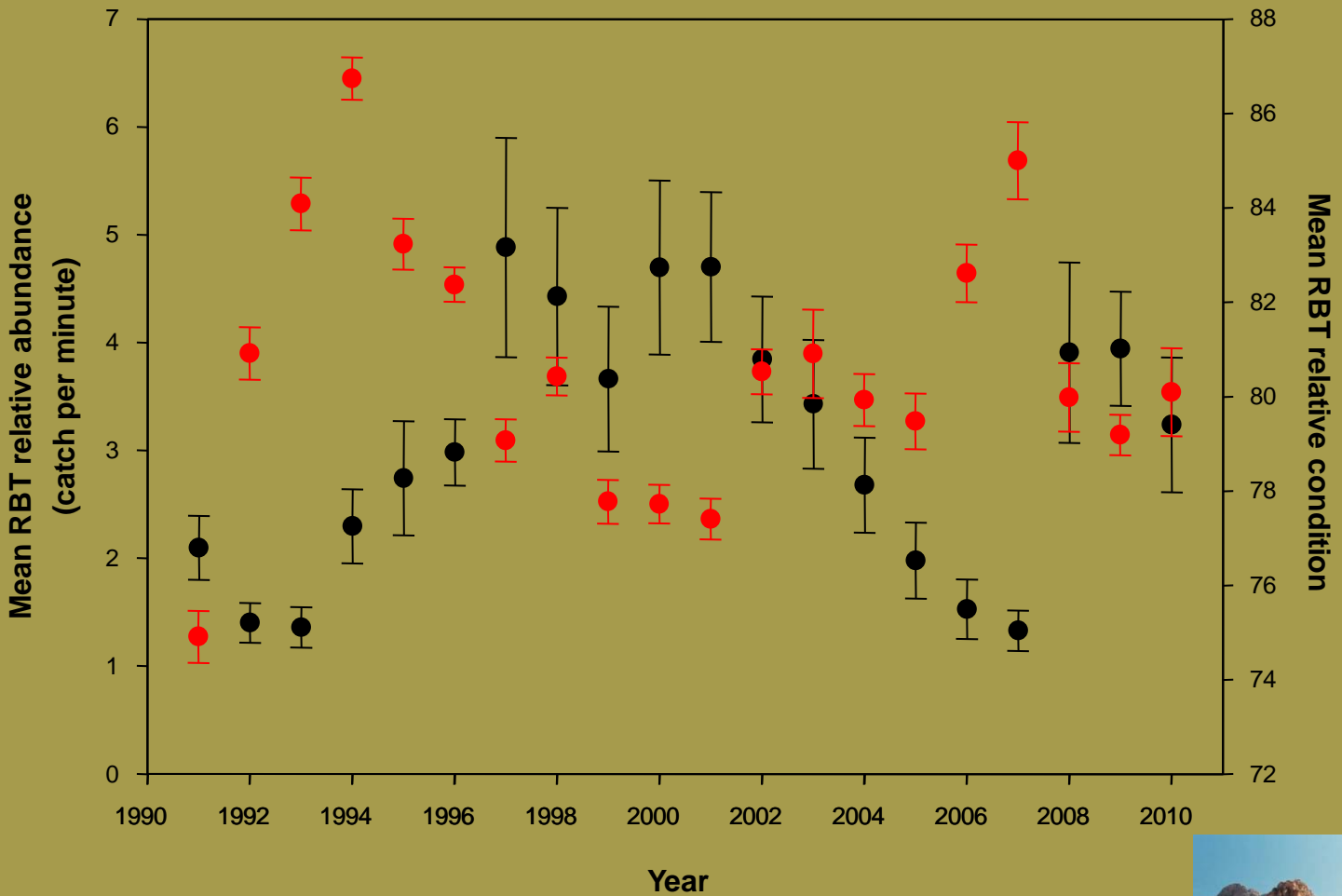
$$K_n = \left(\frac{W}{W'} \right) * 100$$

W = weight

$$W' = e^{[(-4.6 + 2.856) * \ln TL]}$$

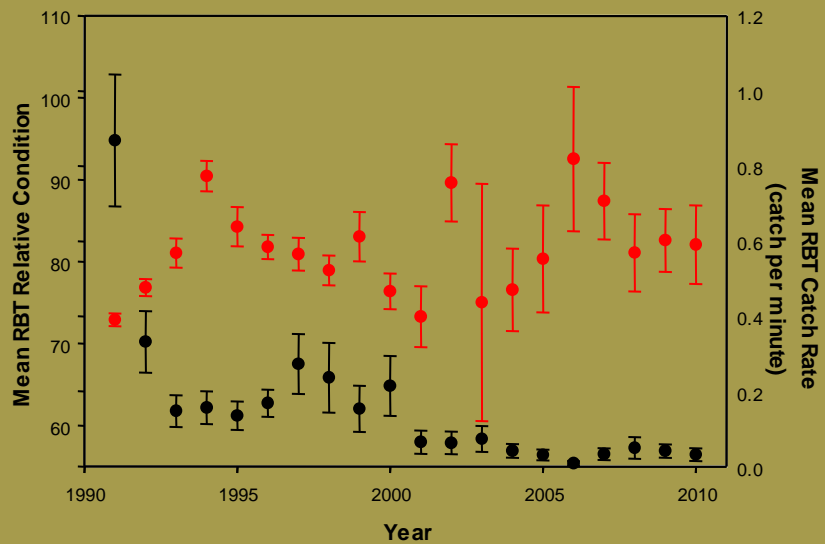
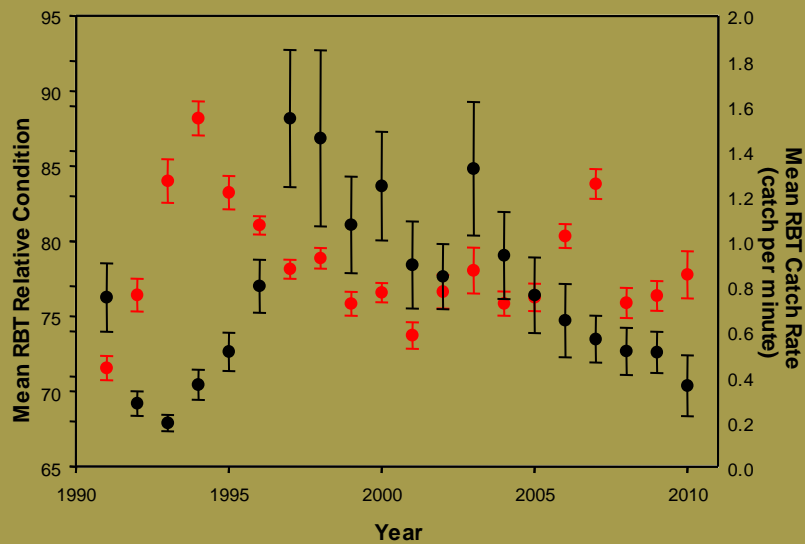
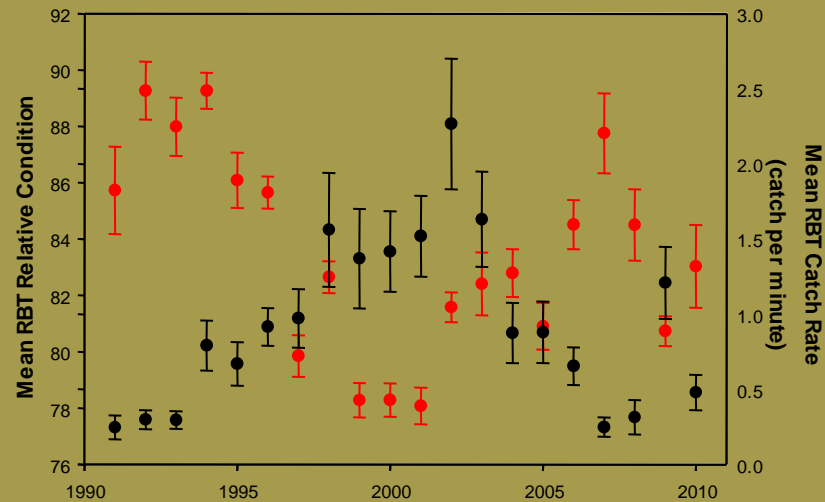
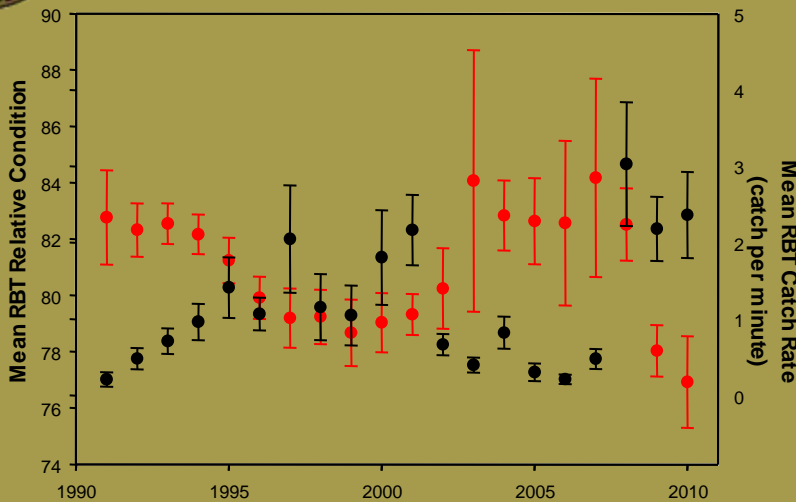


Relative condition





Relative condition





2009 PEP recommendations

- 1. Reduce effort to sample adult RBT population in Lees Ferry to 2 trips/year and get rid of fixed sites**
- 2. Redirect efforts for more non-native sampling**
- 3. Incorporate Rainbow Trout Early Life Survival Study (RTELLS) work**

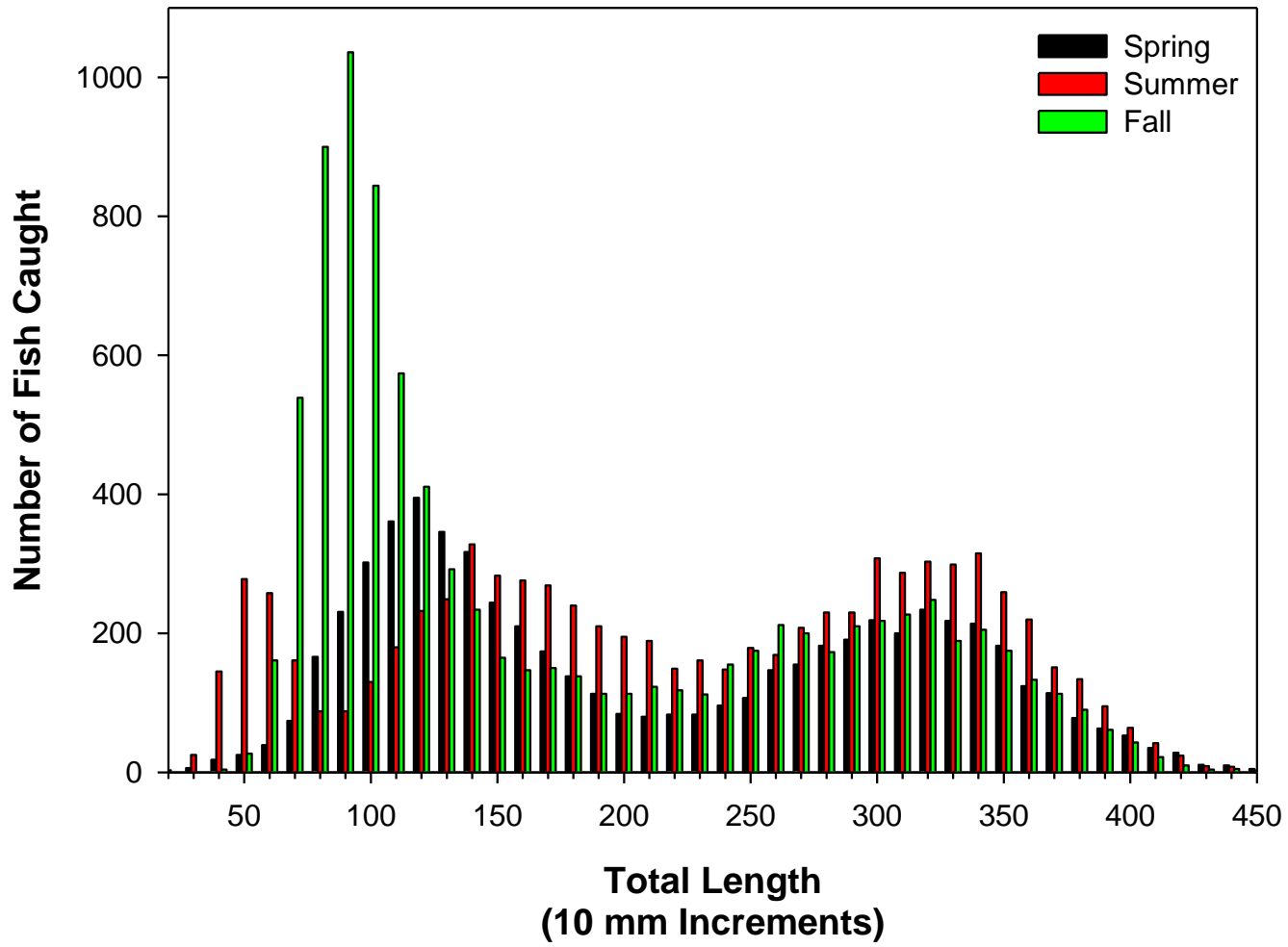


Recommendation 1

- **Adult sampling trips to occur in spring and fall**
 - Spring serves as decent indicator of adult population
 - Fall is best opportunity to detect WD and cohort strength
 - Do we miss any information with the loss of the summer trip?

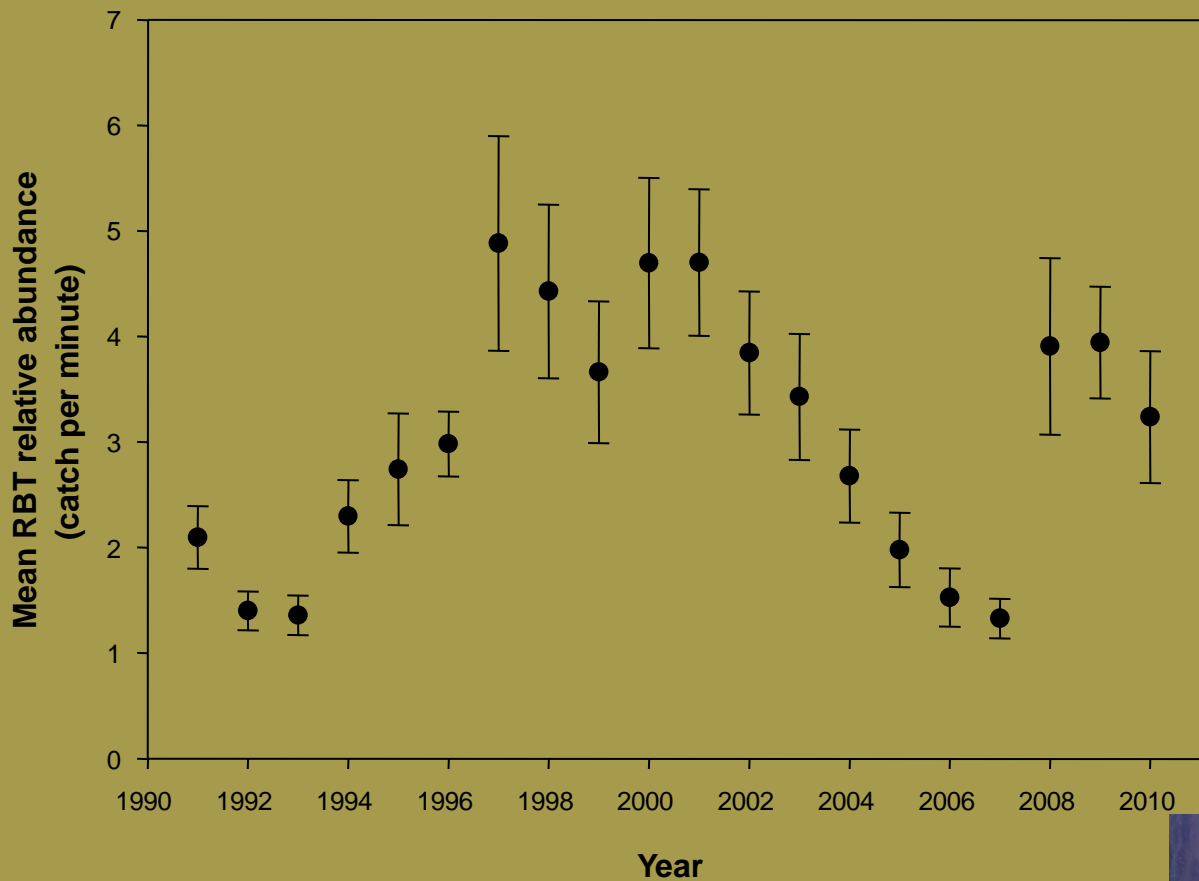


2001-2009



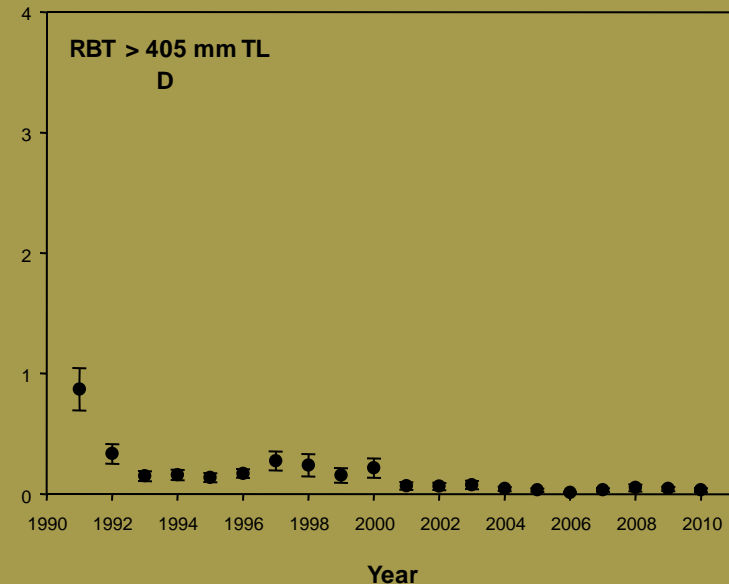
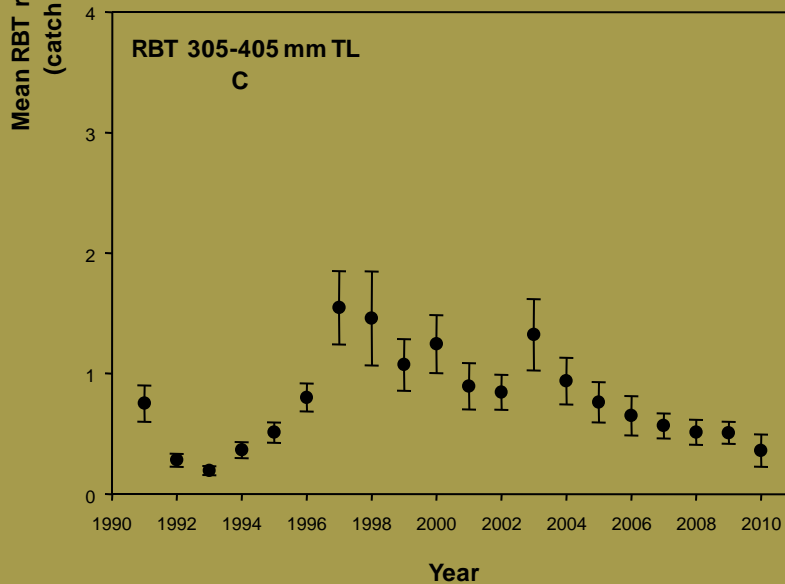
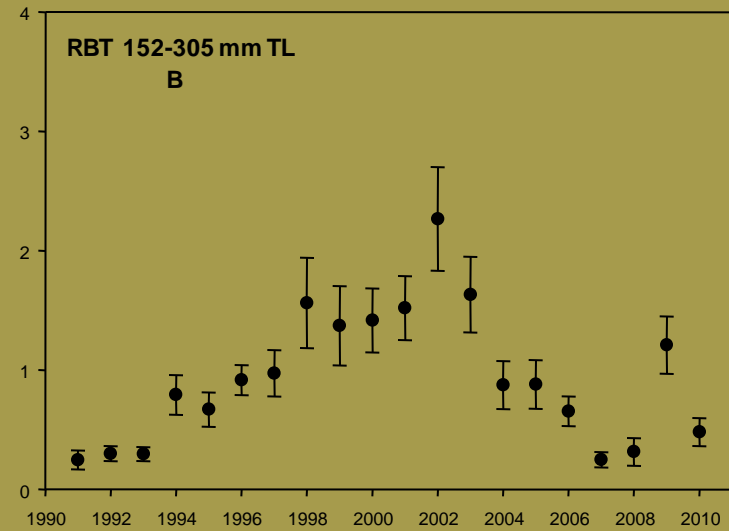
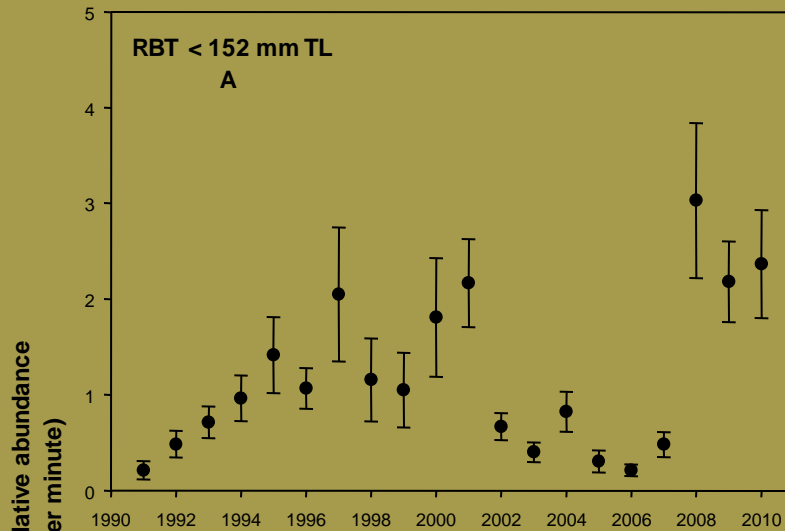


Relative abundance



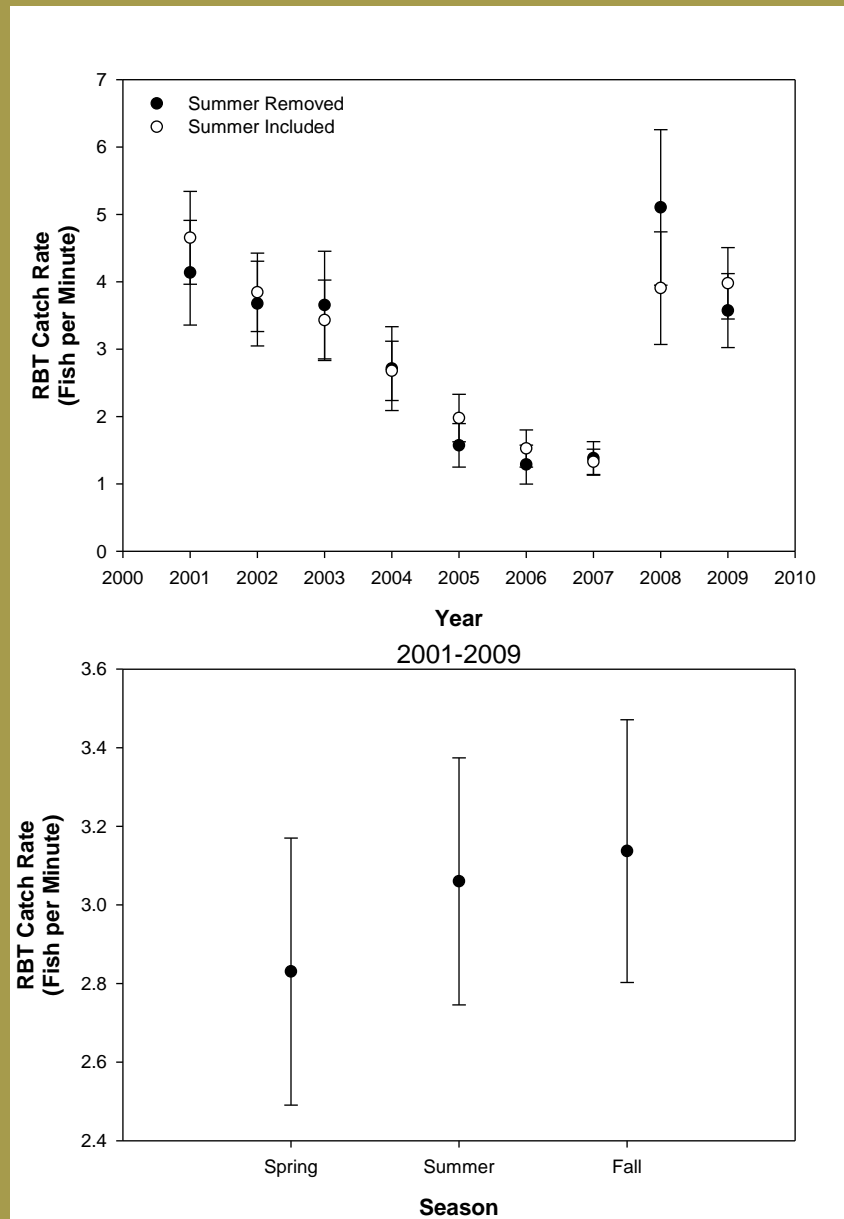


Relative abundance/Size structure





Do we need the summer trip?





Recommendation 2

- **Summer sampling trip geared towards non-native fish**
 - Robin Osterhoudt

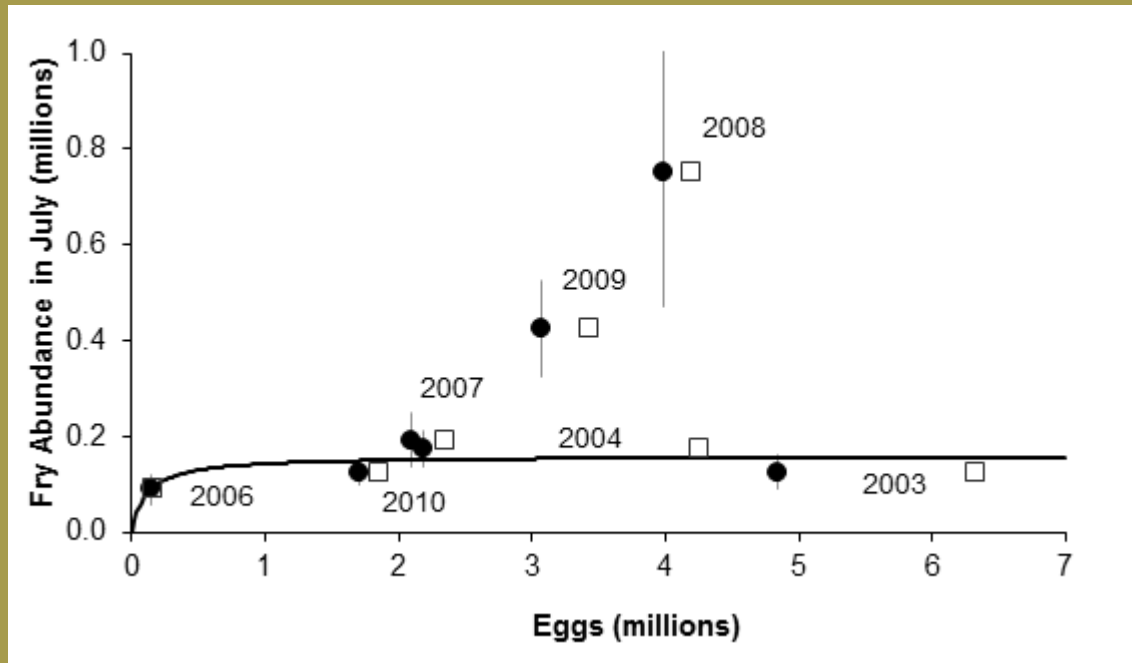


Recommendation 3

- **Coordination with Korman and Foster**
- **AZGFD perssonel doing much of the work in coordination with Foster**
- **Korman still custodian of the data**
- **Incorporating results into the annual report**



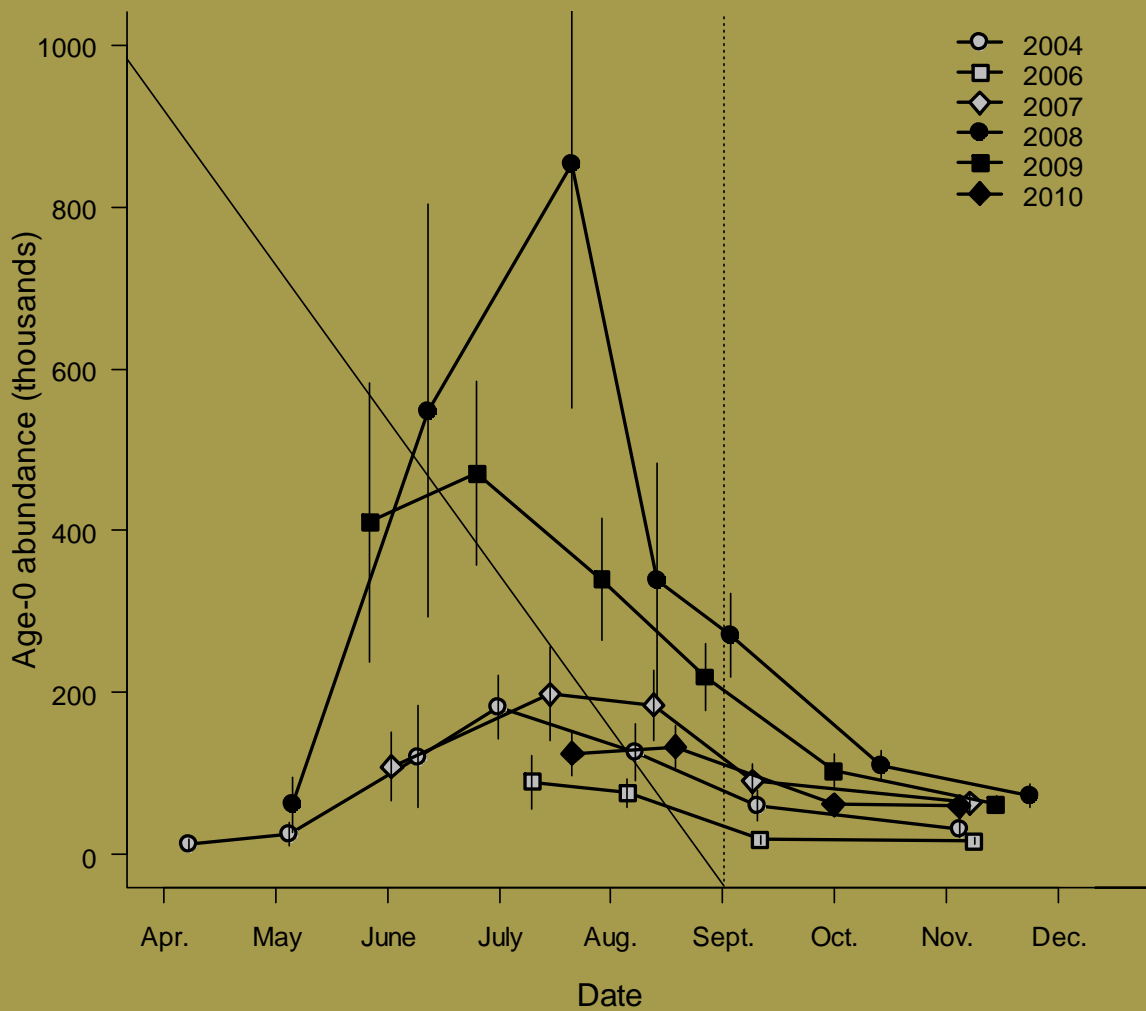
RTELLS



Josh Korman, 2010 preliminary data



RTELLS



Foodbase

- Preliminary results available through Ted Kennedy
 - Started in ___?
- Very informative and, along with RTELLS, helps explain recent trends
- Provides better picture of Lees Ferry ecology and rainbow trout population responses to various flow regimes
- Recommend this work to continue and possibly expand



Conclusions

- **Lees Ferry fishery monitoring**
 - Last year it was concluded that fall steady flows aided in YOY and juvenile survival. It now looks as though the spring HFE and it's impact on the foodbase had more to do with that and the effects are diminishing.
 - Recruitment of 2008 cohort into young adult population. Not so much with the 2009 cohort.
 - Numbers of small fish remain high while numbers of large fish continue to decline.
- **Whirling disease**
 - First detected in June 2007
 - No detections since

