Crappie in Louisiana

Robby Maxwell and Inland Fisheries Staff | LWFC Meeting | Dec. 7, 2023

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Crappie

- White crappie *Pomoxis annularis*

- Black Crappie *Pomoxis nigromaculatus*

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Reproduction

- Begins when water temperature reaches 60-65°F
  - February in South LA through April in North LA
- Move to shallow water to spawn
- Females spawn with several males
- 30,000 – 200,000 eggs per season
- Highly successful spawn ~every 3-5 years
- "Boom and bust"

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Spawning success is likely based on temperature and water level stability along with minimal wave action.

Mortality

- Two sources, natural and angler-induced
- Annual mortality ranges from 41% (Caddo ‘11-’13) to 93% (Poverty Point ‘10-’12)
- Fishing pressure estimated at 31-68% of total mortality, on avg. 41%

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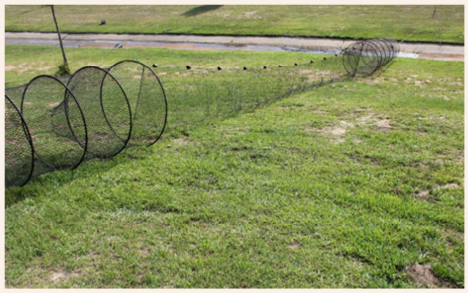
Annual mortality is the total percentage of fish in a population that die every year. Mortality comes from two sources: natural causes, i.e. predation, disease, injuries, spawning stress, complications from old age; and anglers either harvesting or fish dying post-catch

Sampling

- Difficult to sample effectively with electrofishing and gill nets
- Lead nets have been found to be best method
- Creel surveys
- No single method is perfect
- 21 population assessments completed or in progress



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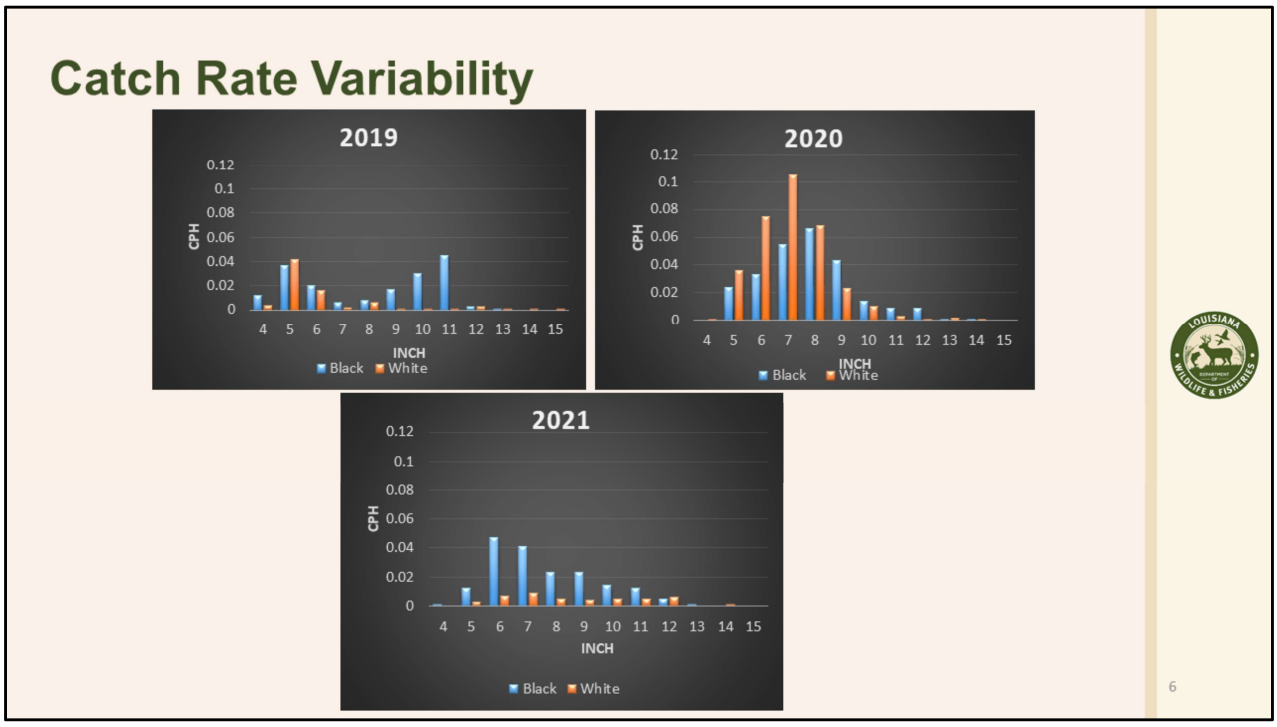
All sampling methods have biases, and we do our best to use adequate data sources and methods to answer questions.

Gill nets can catch larger fish in open water not sampled with other methods. Crappie also move between shallow and deep water seasonally, and different life stages utilize different habitats.

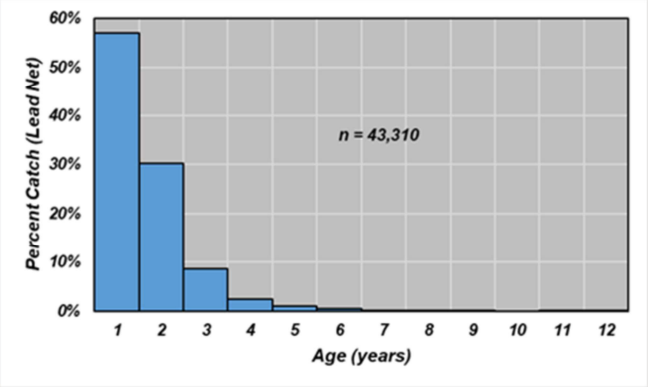


Crappie are on a boom and bust cycle, and prone to overcrowding and stunting.

This is an example of how different sampling can look year to year. D'Arbonne has relatively consistent recruitment for crappie, and is still highly variable in sampling, and this is why we do three year assessments on crappie. You can see shifts in species likely due to turbidity changes.

Statewide Age Structure

- Most crappie <3 years old
- Average waterbody maximum age 6.23



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Growth Rates

Statewide Growth	
Total Length	Avg Years
8"	1.72
10"	2.53
12"	3.88

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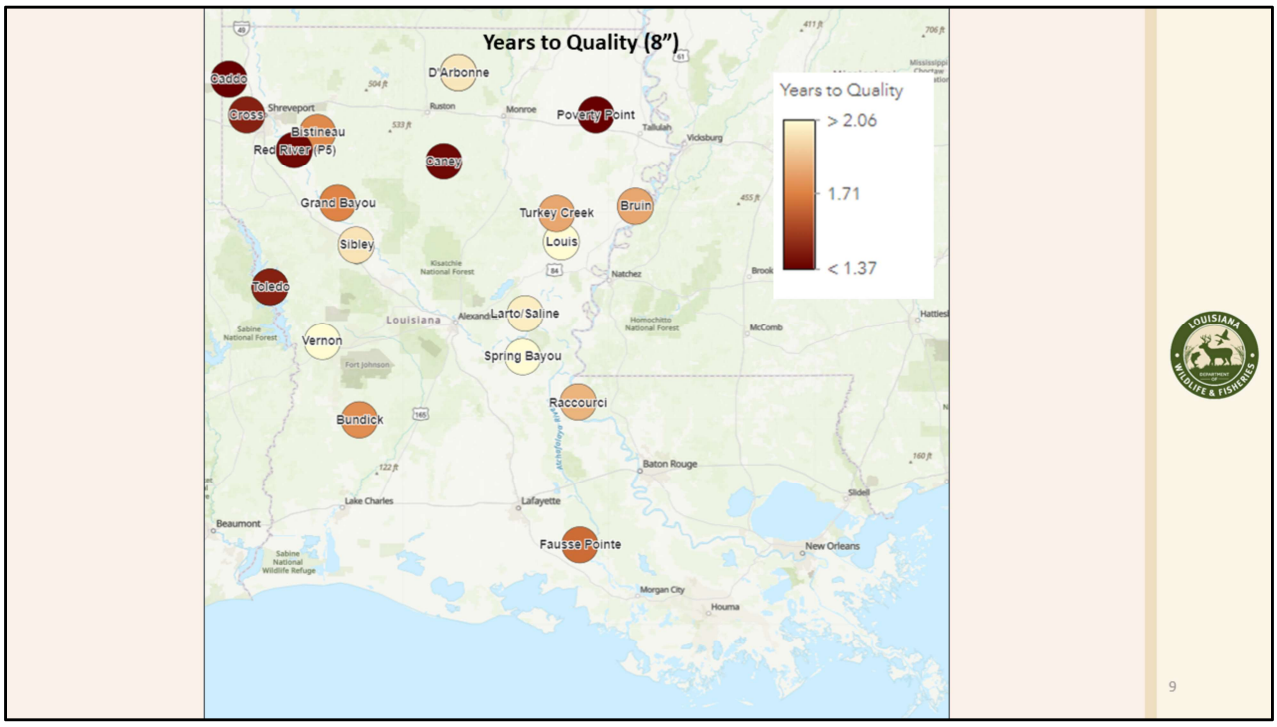
Growth rate is dictated by productivity, temperature, competition (in many forms), prey availability, habitat suitability, genetic factors, and other environmental factors.

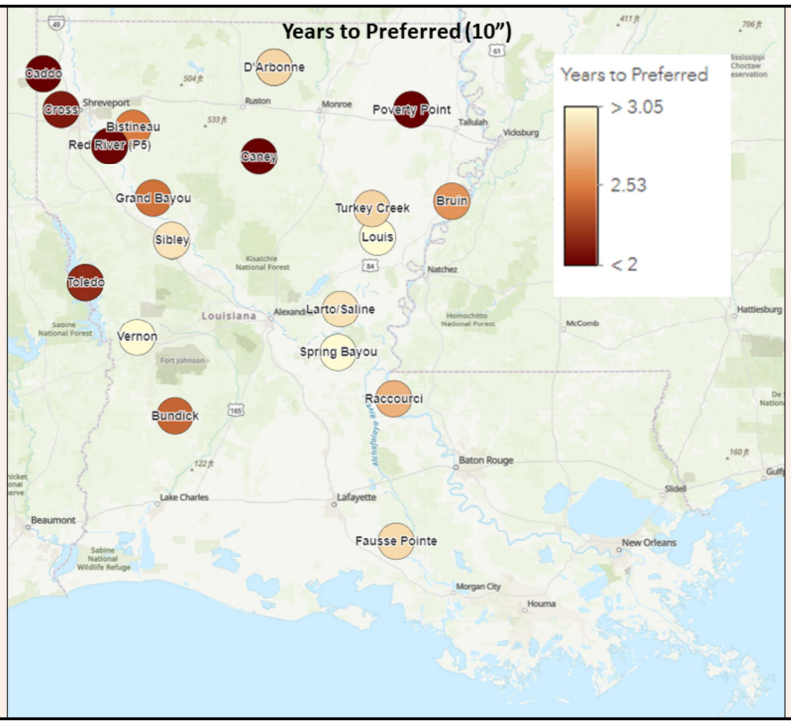
If hatched in March 2023, 8” in November 2024, 10” in September 2025, and 12” in January 2027

Crappie in Louisiana grow relatively fast compared to northern latitudes, but don’t live as long. For example, crappie in Wisconsin average 3” at 1 year, 7.2” at 3 years, 9.6” at 5 years, and 13.1” at 10 years.



Growth rates are generally higher in north LA reservoirs

D'Arbonne is outlier in north LA, and special regulations have been enacted to see if we can help speed up growth. Factors leading to that include reliable reproductive success, high abundance of small crappie, declining productivity,, and possible habitat issues


Years to Preferred (10")
Years to Preferred
> 3.05
2.53
< 2
Caddo
Cross
Red River (P5)
Bistineau
D'Arbonne
Ruston
Monroe
Poverty Point
Tallulah
Vicksburg
Caney
Grand Bayou
Sibley
Turkey Creek
Louis
Bruin
Natchez
Toledo
Louisiana
Larto/Saline
Spring Bayou
Vernon
Fort Johnson
Hattiesburg
McComb
Raccourci
Bundick
Baton Rouge
Lake Charles
Lafayette
Beaumont
Fausse Pointe
New Orleans
Slidell
Morgan City
Houma

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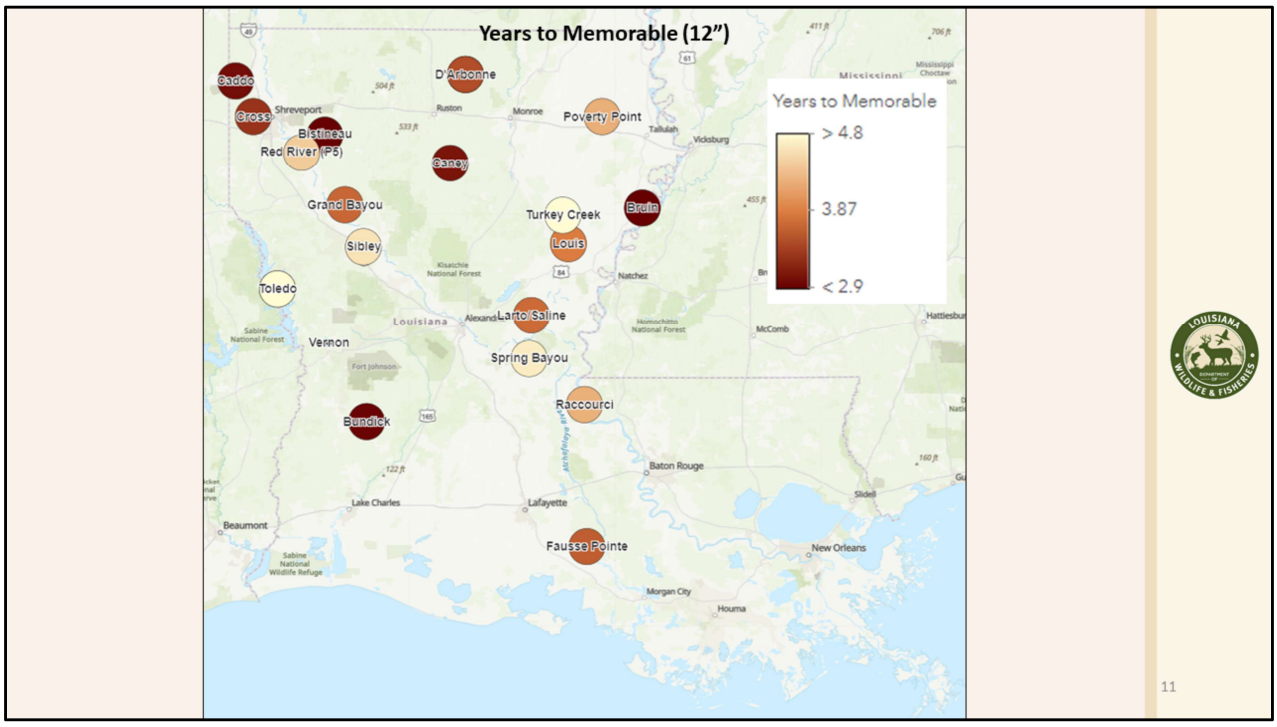

Growth to 12" is tricky to model due to dwindling numbers of individuals at that size. We have begun incorporating gill net data for growth rate estimates, and should get a better handle on large fish going forward.

Louisiana Crappie Regulations

LOCATION	SIZE LIMIT	DAILY CREEL LIMIT
All state waters EXCEPT as follows:	NONE	50 daily; 100 fish possession limit
Poverty Point, Caddo Lake, and Sabine River	NONE	25 daily; 50 fish possession limit
Toledo Bend Reservoir	NONE	25 daily; 100 fish possession limit
Eagle Lake (Madison Parish)	11" MLL	30 daily; 30 possession limit
Bussey Brake	10" MLL	25 daily, in the aggregate 25 fish while on the water and 50 fish while off the water possession limit, in the aggregate.
D'Arbonne Lake		50 daily, in the aggregate, of which no more than 7 may exceed 12" in length 50 fish while on the water and 100 fish while off the water possession limit, in the aggregate.

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Special regulations for Caddo, Sabine, Toledo Bend, and Eagle Lake are all border waters with agreements with neighboring states.

Poverty Point is a small and relatively new lake, and special limits were deemed necessary due to high pressure. Bussey Brake is a similar situation with the recent renovation.

In D'Arbonne we are seeing if a conservative change to regulations, limiting the number of large crappie that are allowed to be taken, can shift the population toward larger fish by encouraging the harvest of small fish.

Other States' Crappie Regulations

STATE	Daily Creel Limit	MLL	Special Creel Limits
Alabama	30	9 Inch	none
Arkansas	20 North – 30 South	none	10 - none
Florida	25	none	10 - 30
Georgia	30	none	none
Louisiana	50	none	25 – 50*
Mississippi	30	none	5 - 20
Missouri	30	none	15 – 30*
Oklahoma	37	none	6 - 15
Tennessee	15	10 Inch	10 - 50
Texas	25	10 Inch	5 - 37

* - limits number of fish over certain size

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Summary of crappie regs in some SE States: The statewide creel limits of most states have been around a long time and in place before tools were available to adequately assess populations.

Odd Oklahoma limit (37). Mention that 37 is simply the midpoint between two opposing proposals (25 & 50).

Call attention to Texas 10" MLL. We shared the results of our TB crappie mortality study with them. They agreed with our conclusions and repealed their 10" MLL on crappie for all LA-TX border waters (TB, Caddo & Sabine River).

IN SUMMARY:
The new tools we have available for crappie management are helping us understand the dynamics of Louisiana crappie fisheries and it's anglers. It's become clear that factors that affect recruitment are the most significant influence. Though environmental factors are unpredictable and beyond our

control, there may be potential for actions to ensure good recruitment in some cases.

Continued sampling of the resource and anglers that enjoy it are needed. That work is now underway.

LA Creel Surveys, 1989-2022

- No harvest difference between 1989-2005 and 2006-2022.

- 56 BOWs, 9,841 parties and 17,456 crappie anglers
  - 50 fish limits - 52 (0.30%)
  - 25 or more fish - 482 (2.8%)

- 22.9% of parties interviewed (2,251) harvested at least 1 crappie ≥12-inches

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Creel Limit Reduction

- Bag limits require significant reduction to lower harvest
- Would lead to decreased harvest of small fish

Creel Limit	%Fish Saved
5	50.0%
10	28.4%
15	16.4%
20	9.6%
25	5.4%
30	2.9%
35	1.3%
40	0.5%
45	0.1%

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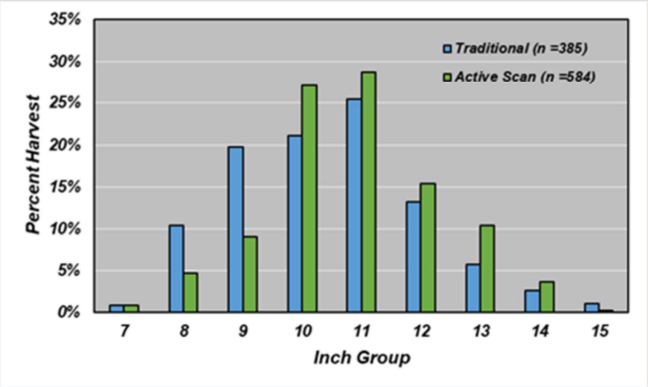
Live Imaging Sonar, D'Arbonne Example

- Harvest distributions significantly different (KS test, $p<0.0001$
- Higher harvest rate of smaller fish with traditional gear



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In AR, LIS users caught 2.4 crappie/hr, while non-users caught 1.1 crappie/hr. They did not show a difference in size.

D'Arbonne also showed about double the harvest rate.

Conclusion

- Population modeling used to test efficacy of regulations
- Most anglers do not catch 25 or 50 crappie; limits would have to be drastically lowered to impact harvest rates
- Lower harvest rates of smaller fish would impede growth rates
- LIS users show increase in catch of larger fish; we are monitoring

Questions?
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Louisiana Records-Black Crappie

RANK	WEIGHT (LBS)	ANGLER	SITE CAUGHT	DATE CAUGHT
1	3.84	R. Causey	Poverty Point Res.	April 2010
2	3.55	C. Tidwell	Caney Lake	February 2003
3	3.55	J. Crouch, Jr.	Toledo Bend	March 2004
4	3.47	F. Meche	Lake Henderson	September 2004
5	3.33	B. Nola	Caney Lake	January 2003

NOTE: All crappie verified by a biologist and weighed on certified scales. Information acquired from the Louisiana Outdoor Writers Association (LOWA; https://louisianaoutdoorwriters.com)

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Louisiana Records-White Crappie

RANK	WEIGHT (LBS)	ANGLER	SITE CAUGHT	DATE CAUGHT
1	3.80	T. Ricca	Lake Verret	May 2010
2	3.76	J. Reeves	Bussey Brake	February 2023
3	3.65	S. Hodge	Bussey Brake	February 2022
4	3.60	J. Griffin	Bussey Brake	February 2021
5	3.57	S. Adams	Bussey Brake	February 2022

NOTE: All crappie verified by a biologist and weighed on certified scales. Information acquired from the Louisiana Outdoor Writers Association (LOWA; https://louisianaoutdoorwriters.com)

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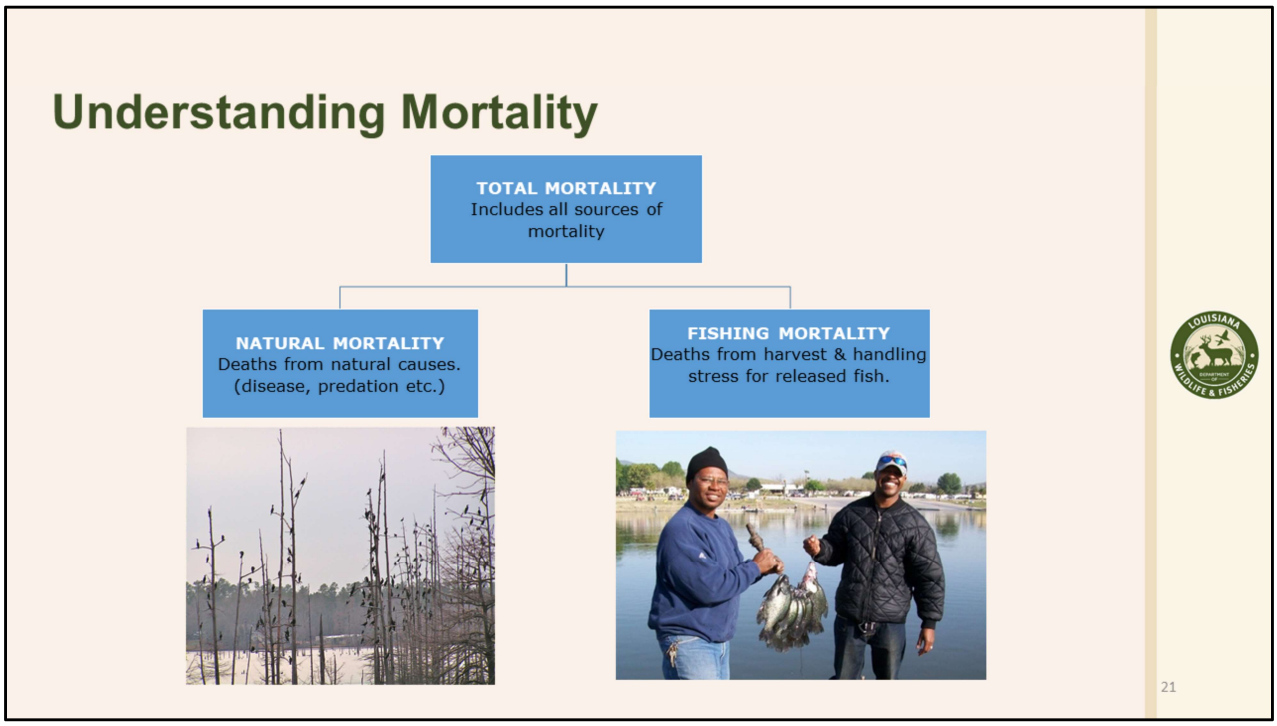
Bussey Brake dominates top five. Small, recently renovated impoundment. High harvest pressure and high productivity leads to large fish.



Total mortality is comprised of natural mortality (disease, predation, etc..) and fishing mortality (fish harvested or inadvertently killed by anglers)

FOR EXAMPLE:
We have already determined Total Mortality for two lakes:
Toledo Bend: 81%
Darbonne Lake: 73%

Simplified explanation of mortality:
1000 fish x 81% = 810 fish > 190 remaining Year 1.
190 fish x 81% = 154 fish > 36 remaining Year 2
36 x 81% = 29 fish > 7 fish remaining Year 3
7 x 81% = less than 1 fish remaining in Year 4