REDFISH STOCKING INITIATIVE OCTOBER 2024

RFRI Founder, Marine Fisheries Biologist and former Head of Fisheries. State Management of Red Snapper, La Creel & ROLP.

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ABOUT US

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RFRI was founded in 1998 as a non-profit.

To promote marine fisheries conservation and restoration through education and public involvement.

Since its inception, RFRI has been an integral part in developing improved data collection. TAG LA & the Anglers Almanac.

RFRI gathers data for *proactive management* rather than the industry standard, reactive.

TEXAS

In 1985, Dow , CCA TX, and TPWD helped by the Sport Fish Restoration Act combined their resources. This team conceived a plan to construct a red drum hatchery and education center.

Today, red drum and spotted seatrout populations are stable in response to TPWD's coastal management plan. Along with TPWD’s other 2 marine hatcheries, Texas produces quality sport-fish species for stocking Texas bays to counterbalance the effects of habitat degradation, natural catastrophes and fishing pressure on the species.

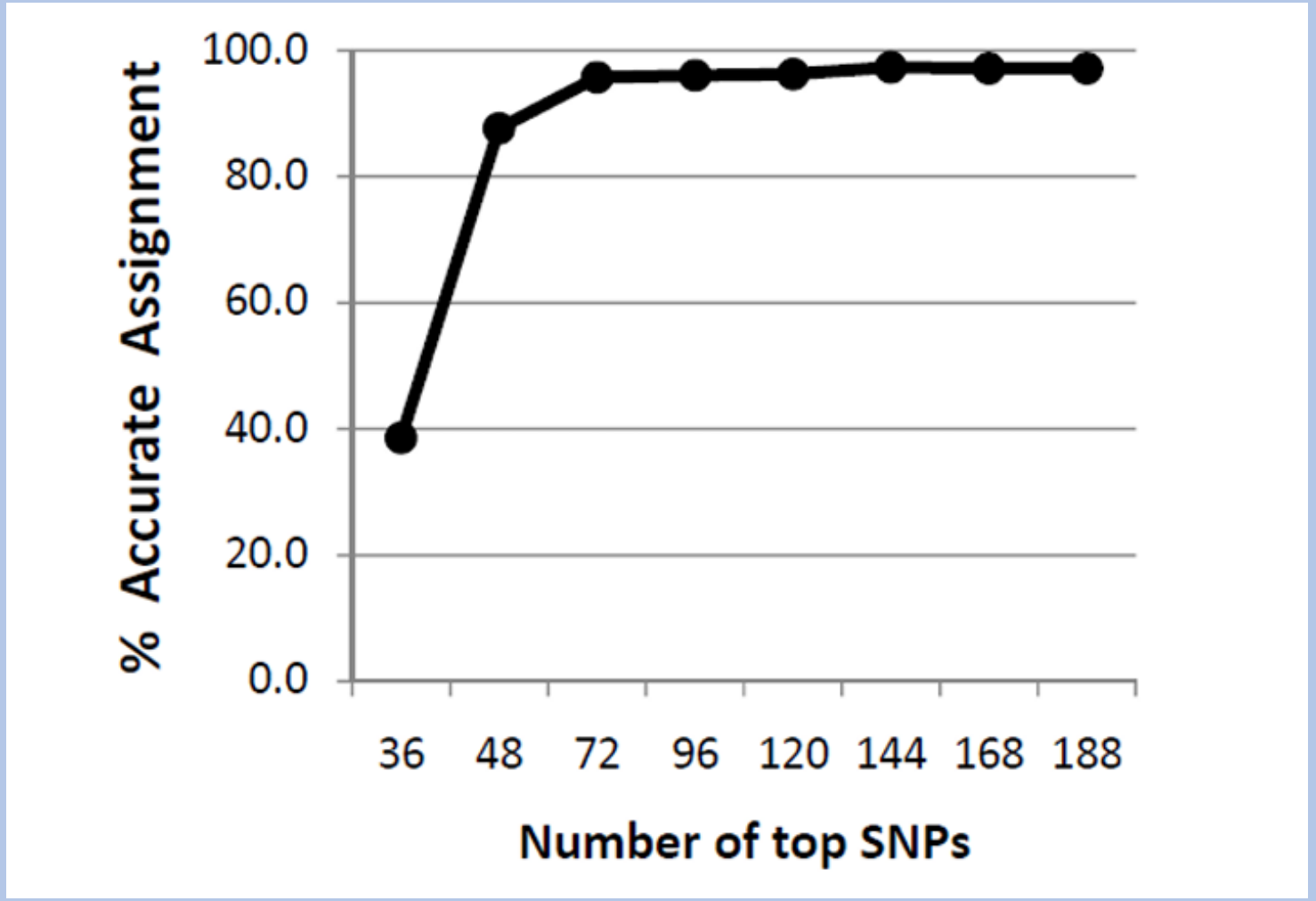
TEAM

Hatchery Production???

- What percentage of hatchery produced fish recruit into the fishery?
- Economically relevant question?
- Allows one to quantify the value of hatcheries?

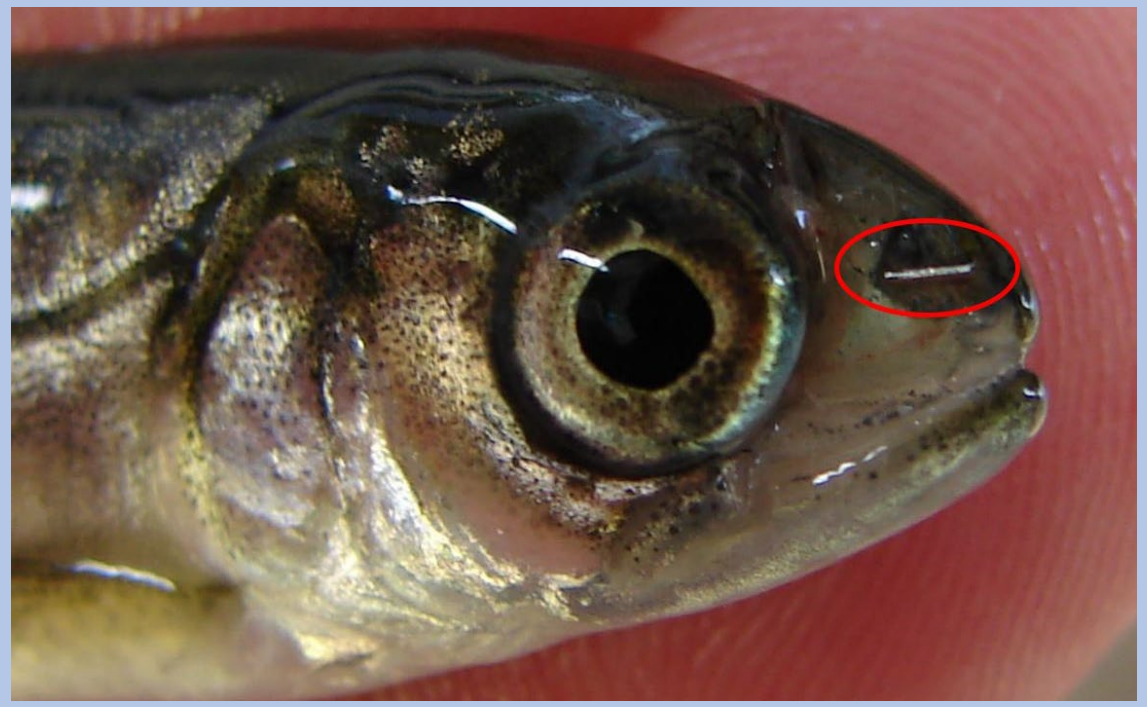
Parentage-based tagging (PBT)

- A large- scale, non-lethal genetic tagging technology for monitoring and evaluating hatchery stocks
- High accuracy (>95%)
- **single-nucleotide polymorphisms**

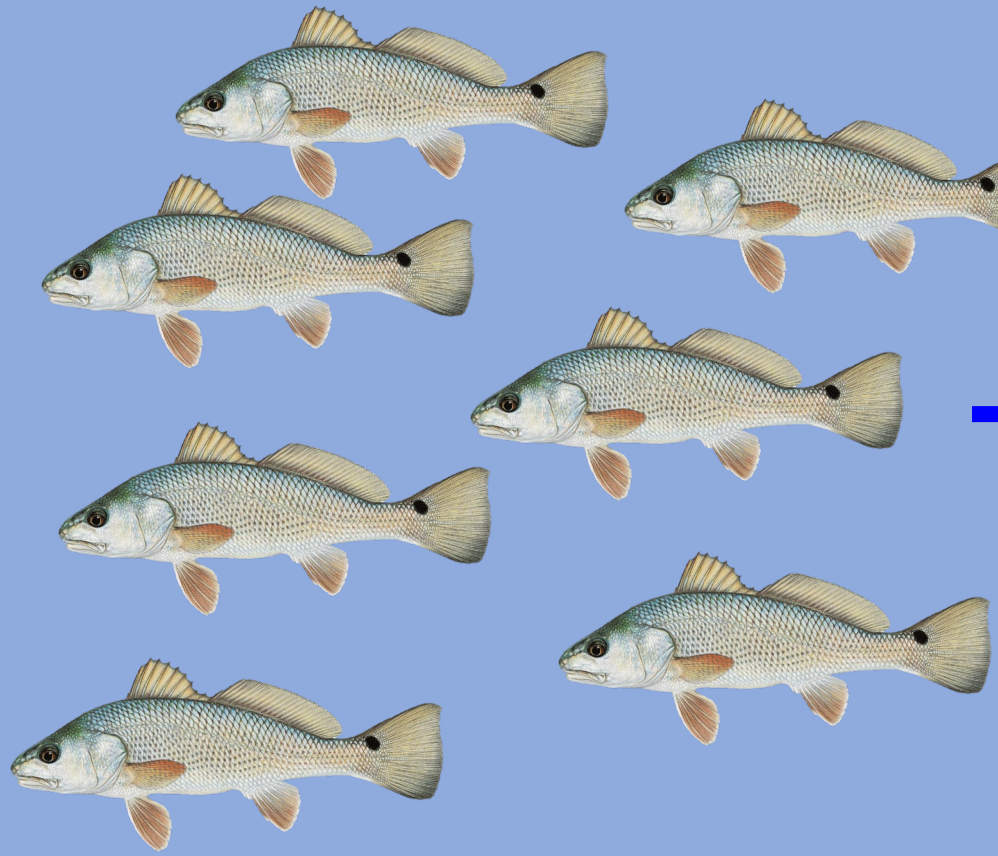


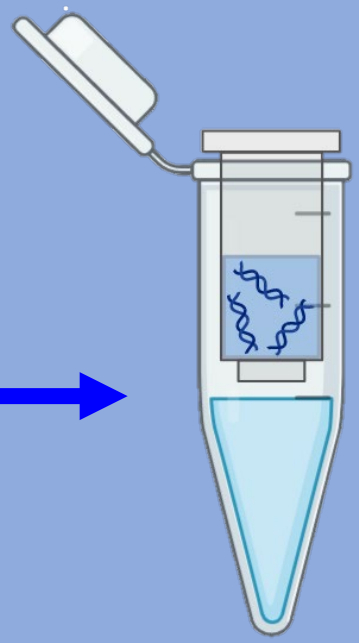
Advantages of PBT

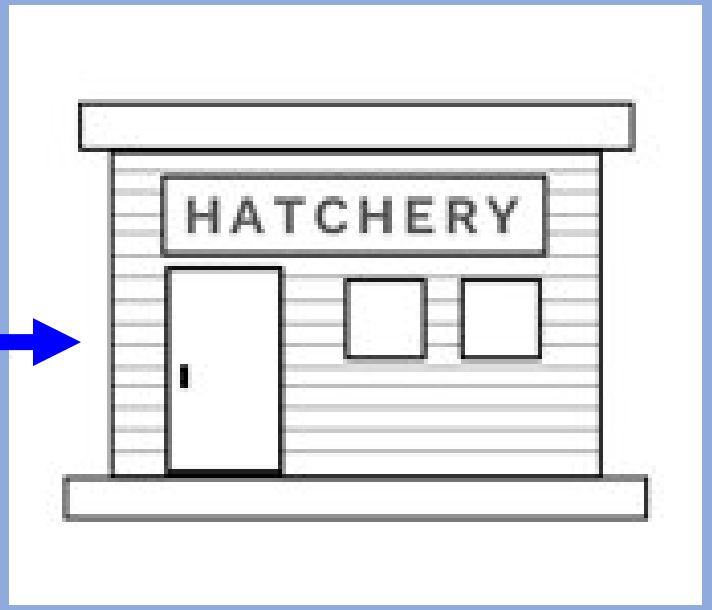
- Reduced tagging effort
  - Mass production/tagging
- No tag loss
- No tag induced impacts
- Non-lethal sampling
- Track at all life stages
- High resolution
  - Brood year
  - Hatchery



Parentage-Based Tagging (PBT)





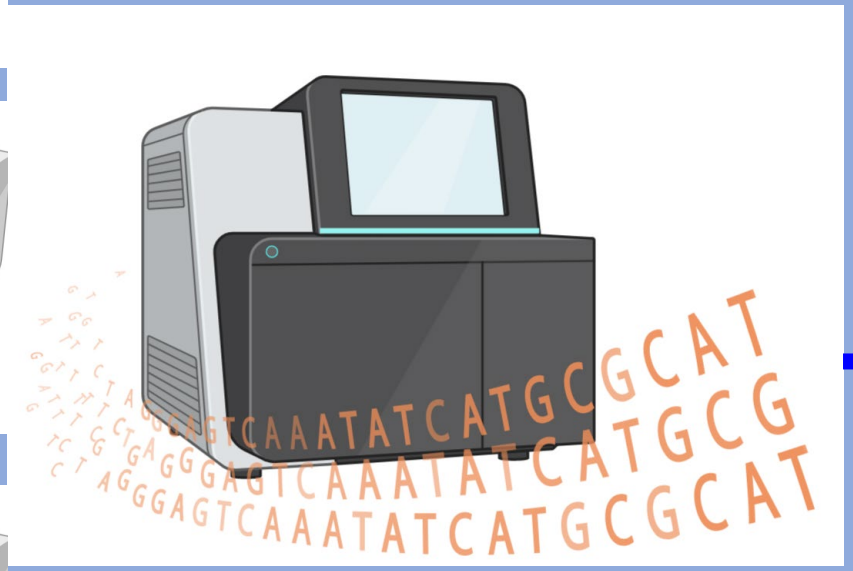


1. Collect broodstock

2. Collect tissue samples from broodstock (=fin clip)

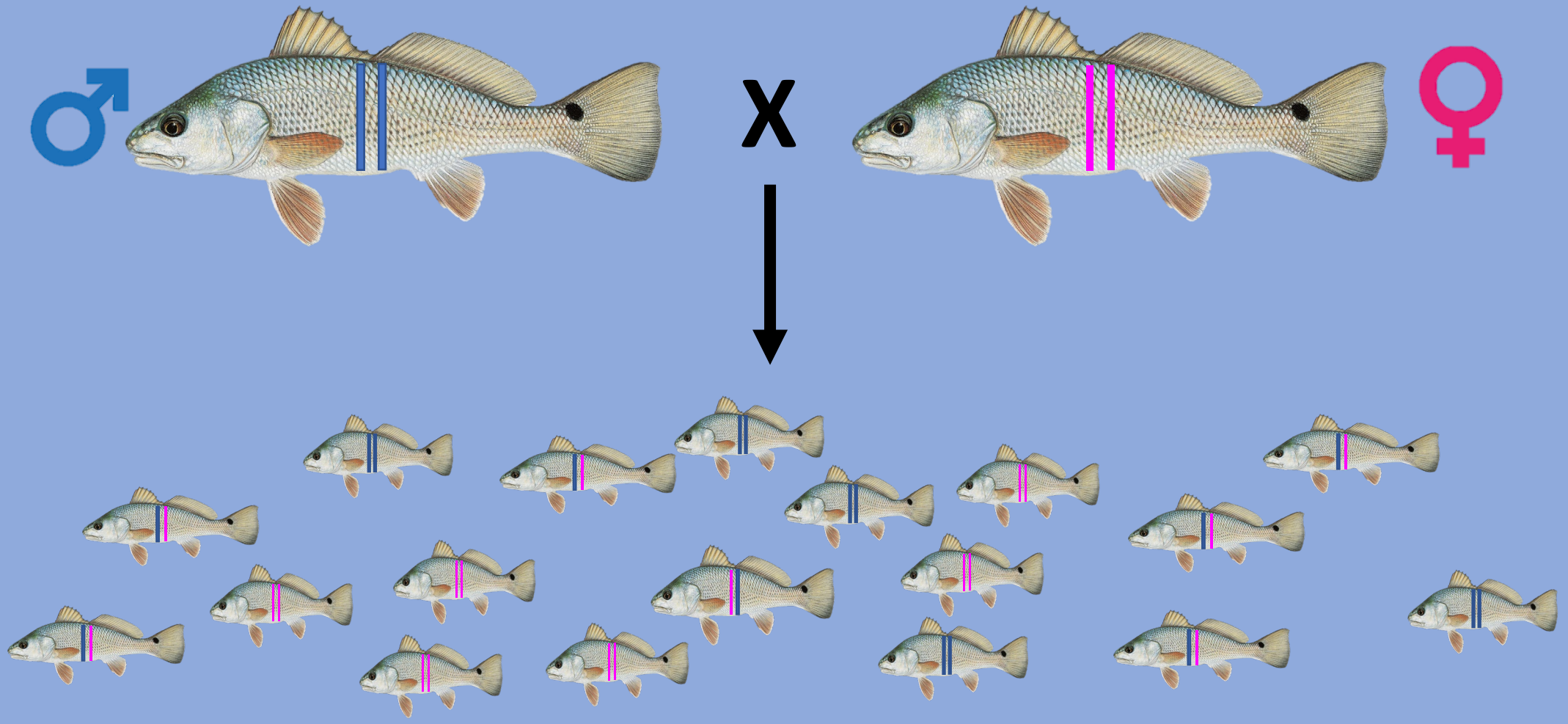
3. Spawn broodstock

Parentage-Based Tagging (PBT)



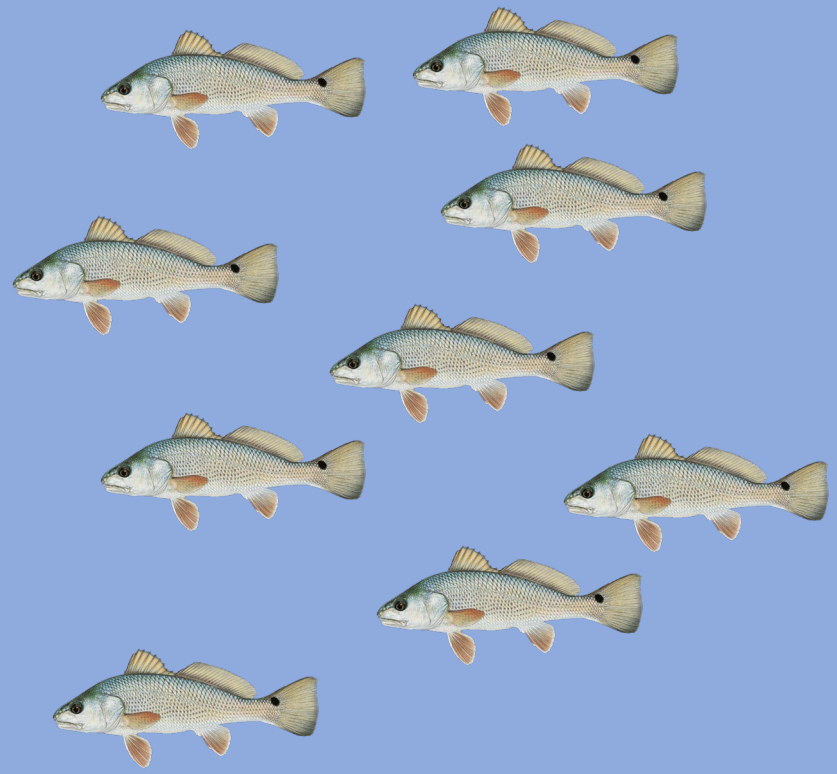
4. Gather genetic data from broodstock (SNPs=single-nucleotide polymorphisms)

5. Computationally develop diagnostic SNP panel based on the broodstock



By knowing the genetic composition of the parents (=broodstock), every possible combination of alleles in the hatchery offspring can be calculated computationally. Essentially all fish are “genetically tagged” because every possible combination is known.

Parentage-Based Tagging (PBT)



Hatchery Derived

Wild Produced

6. Capture fish from the wild and genotype using diagnostic panel

7. Determine if the fish are hatchery or wild produced using the broodstock diagnostic panel

State Specific Diagnostic SNP Panels

Diagnostic SNP Panel (Texas)

Diagnostic SNP Panel (Louisiana)

Diagnostic SNP Panel (Mississippi)

Diagnostic SNP Panel (Florida)

Texas
Austin
San Antonio
Houston
Louisiana
Mississippi
Baton Rouge
New Orleans
Alabama
Montgomery
Tallahassee
Jacksonville
Orlando
Tampa
Miami
Straits of Florida
Gulf of

State Specific Diagnostic SNP Panels

1. Louisiana or Texas hatchery fish?
Or naturally produced?

2. Without shared diagnostic SNP panels we would not know that a recapture is wild produced or from another state's hatchery

Texas, 1992-2016, 25M survived to fishery. Of those **6.1%** or 1.5M are HF. They release fry! Genetics. Texas stocking program has worked effectively to supplement the fishable stock and has insured against the adverse effects of catastrophic events.

Florida, Preliminary data from **CWT** indicates that hatchery contributions to one local stock of subadult red drums are at least **4.2%** and has the potential to be much higher.

California, White seabass HF contribution to the wild adult & subadult population is nearly 30**%,** 4xs as CWT contribution estimates of 7.4%. Mexico 0 to 7.5%!

SC, A HF contribution of **28.7%** from stocking effort in 2020 & **12.4%** from stocking effort in 2019.

LA 1st…Dr. Piller estimates 25%, we will use 15%.

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Traditionally, scientific literature from stocking programs elsewhere states the percent of recaptures equals only about 1.9%

CONCLUSION

- Genetics vs CWT/Dart Tags.
- SNPs (markers) increased from 36 to nearly 200 improving detection rate from 40% to 95%!
- PBT also allows detection of offspring.
- Centralized Dataset (Panels & Samples).
- A Robust Standardized Monitoring Program.

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Traditionally, scientific literature from stocking programs elsewhere states the percent of recaptures equals only about 1.9%

THE ASK

Looking for 5 State Support of this effort:

Action Items

- Document Support
  - Standing Agenda Item at GSMFC
- Actively Recruit Funding
  - Donations
    - Individuals, Corporate, Local, State, Federal (GRANTS)
- LEAD (I will find the $$, need 5 State Support)

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