OREHP Advisory Panel Meeting

September 27, 2016

Los Alamitos, CA

Attendees:

Tom Barnes	Mark Kukura	John Riordan	Valerie Taylor
Gary Burke	Randy Lovell	Jim Salazar	Dallas Weaver
Mark Drawbridge	Jim Moore	Brice Semmons	
Kathryn Johnson	Mark Okihiro	Mike Shane	
Wayne Kotow	Kirsten Ramey	Bill Shedd	

Hatchery Update (Mark Drawbridge):

- Approximately 69,000 fish have been released so far in 2016
- There are currently about 15,000 fish at the hatchery
- Larval survivorship is high and consistent
- All active cages are stocked (MDR, Newport, both Catalina pens, SWYC, King Harbor, Huntington Beach)

Husbandry

- *Cryptocyon* parasite breakout in the cages partially attributed to warm water conditions
- Larger, deeper pens have maximum water exchange and reduce the prevalence of gas bubble disease (GBD)
- Shallow water pens are easier for pen operators, but lead to problems with husbandry (diseases including GBD)
- Adjust production so shallow pens don't have fish when water temperature is too warm
- Hatchery will look at starting production runs earlier in the year
    - Consider a mandatory cutoff date option - even if fish aren't 8 inches, get them released to lessen the likelihood of husbandry problems

Other Issues

- New people operating facilities, experience with different issues is lacking
- No longer have full time growout coordinator position
    - Half-time coordinator/hatchery manager instead
    - Growout coordinator tasks are assigned to the Assistant Hatchery Manager with other culture staff assisting
- Use of HSWRI divers to help clean nets at the Catalina Seabass Fund facility
- Treatment for parasites didn't work well

Broodstock

- Total broodstock at hatchery is 131
- Not enough resources to collect additional fish at the moment

Self-cleaning tank project update

- Funded by Sea Grant
- Technology/engineering project
- All-in-one tank
- Designed in Norway and customized for our application
- Tests underway to see how fish respond
- Reduces labor needed to clean
- Minimizes the number of fish that get siphoned up during cleaning process

NOAA-SK Grant with OSU

- Larval nutrition study
- Optimizing enrichment to mimic natural prey (copepods)
- Trying to make a rotifer that is similar to copepods
- Increasing levels of minerals and highly unsaturated fatty acids (HUFA) found in copepods

  Question
  Dallas Weaver: The HUFA's in copepods are wax esters rather than omegas. Have you looked at wax esters?

  Mark Drawbridge: I would have to ask about that.

Field Studies (Mike Shane):

Gillnet surveys

- In FY 15/16, 254 juvenile white seabass were recovered in the gillnet surveys
- Unable to do Oceanside site sampling in June due to weather
- Use October and June sampling when looking for long term trends
- Mean since FY 12/13 is about 19% tagged fish recovered

Fisheries sampling

- Total fish scanned in 2016 = 1,799
- 1,673 fish scanned from the commercial fishery
- 2 tagged fish were recovered from the commercial boats in Ventura
- Summary of 16 years of data used to determine effort
    - As we increase the number of fish scanned, the more tags we recover
    - Paper shows what should be expected for survivorship

- Herves, et al. published in 2010 modeled survivorship to 28" for hatchery released fish by season and release methd

Questions/Discussion

Bill Shedd: What is the ratio? Does the ratio remain the same as the number of fish sampled increases or does the percent stay the same?
Mike Shane: We've gotten as high as 0.3 percent recovery. It hasn't ever gotten over 1%.

Tom Barnes: So there's no consistent trend, then?

Mike Shane: No, no consistent trend.

Dallas Weaver: Larval survivorship has increased. We may see a shift on the percentage of tags recovered in the coming years.

Mike Shane: Wild recruitment is about 3 years after release.

Seabass in the Classroom

- Eleven schools participating in the Seabass in the Classroom program
  - All currently have fish
  - Will be releasing fish in December

Question

John Riordan: Does water temperature affect tag recovery?

Mike Shane: WSB landings decrease during warm water years (i.e. El Nino) and the number of tagged fish recovered is proportional to the number that are scanned for tags.

Pathology (Mark Okihiro):

- Three major problems occurred in 2016
  - Protozoa in broodstock
  - Gas Supersaturation (GSS) eye lesions in hatchery
  - Cryptozoan parasite in growout facilities
- Central nervous system (CNS) findings in broodstock Q1 tanks
  - Loss of 45 white seabass
    - All 37 fish in Q1 were euthanized
    - All fish in Q2 were euthanized
  - Especially virulent pathogen that enters olfactory pathway to the brain
  - If this parasite gets into the hatchery, it can disrupt hatchery production for an entire year because it's untreatable
  - Breakdown in biosecurity
    - Hatchery needs to take special care to reduce risk

        - Makeup water, UV filter, ozone filtration, use of sentinel fish
    - Avoid use of smaller and/or shallow raceways in summer

- With warmer water temperatures, the numbers of eye lesions associated with GSS increase
    - GSS is essentially irreversible
    - Gas gets trapped in the eye or cornea and leads to secondary bacterial infections
    - Recommendations are to avoid using raceways in summer, reduce the use of J2 system tanks, and avoid summer stocking of shallow growout pens

- *Cryptocaryon irritans* is a ciliated protozoan with an indirect life cycle
    - In July, MDR and Newport were affected by *Cryptocaryon irritans*
    - Treatment was ineffective - total loss of all fish in these pens
    - Fish die from osmotic shock and hypoxia
    - Recommendation is to minimize use of shallower growout facilities in warmer water years
    - 2008 King Harbor outbreak
        - Water temperatures are lower at this facility, so losses were not catastrophic

<u>Questions/discussion</u>

John Riordan: Did the pathogen in the quarantine tanks come in with the fish?

Mark Okihiro: That's a possibility, but it could also have come in from the lagoon. The Q1 tank had smaller fish caught coastally, while Q2 held older adults from Catalina. The Q2 fish had no exposure – possibly immune.

Dallas Weaver: In regards to GSS during El Nino conditions and warmer water temperatures, we need to increase the dissolved oxygen while decreasing the pressure. You can do this in pens like Huntington Harbor by flushing to increase the DO.

Mark Okihiro: Any recommendations you have are welcome because it's a massive problem.

Dallas Weaver: With catfish in south, they take cooler water from bottom and run it through to remove waste.

Bill Shedd: There are two sides to the story. There is concern that something's changing. The pen operators' opinion is that the health of the fish is improving. We don't see that. **Bill reads motion from the growout operators' meeting* (see attached)* This is anecdotal, but more information.

Mark Okihiro: In regards to the random sampling issue, I went back and sampled randomly.

What I found was a high level of deformities. I document with photos and numbers and I'm seeing a lot of deformities. It's an impossible task for hatchery personnel to screen out all deformities. Staff turnover rate is high. Hatchery can release millions of larval fish OR bigger fish to have more chance for survival. In the last group of fish I looked at last Thursday - 40% had swim bladder deformities. The growout guys don't look at fish like a pathologist.

Dallas Weaver: Swim bladder deformities and development – we don't have the data on development or variation. Wild specimens needed – have they been histologically tested?
Mark Okihiro: I personally, have never seen a swim bladder deformity in wild fish.
Dallas: Swim bladder is tied in with super saturation.

Mark Okihiro: Swim bladder deformities are just one example. There are things the growout guys can't see.

Bill Shedd: The question is - what does that mean? What impact does it have on the program? These things we're calling deformities- what affect do they have? Somewhere in the middle is the truth. Sky is falling vs. doesn't matter.

Mark Okihiro: These fish are in a protected environment where they're fed. Once released, they enter the food chain. If you have a jaw deformity or heart issues, it decreases the chance you'll be able to escape predators, find food, etc.

Wayne Kotow: Maybe that's good. Maybe it'll increase the chance of survival for the good ones.

John Riordan: Can you tie deformities to anything?

Mark Okihiro: Water quality, nutrition, genetics, etc.

John Riordan: Seems like we go through ups & downs. It would be nice if we could figure it out.

Bill Shedd: Is there a genetic basis?

Mark Okihiro: Deformities are coming from multiple broodstock tanks, multiple fish. It's more likely that it's water quality vs genetic.

Bill Shedd: Each adult produces one set of offspring. The question is whether or not phenotype variability as it relates to deformities. Some eggs are unfit in nature. In the hatchery context, these unfit fish are all kept alive.

Mark Okihiro: That supports my argument for releasing more fish. Letting nature decide who survives. Right now, the hatchery decides.

Bill Shedd: Are these deformities due to genetics or hatchery environment? This seems to be an important question.

Dallas Weaver: There are husbandry issues that cause deformities- if they're overfed at certain life stages. If a fish eats food from the bottom, Vitamin C leaches out. Now, the fish have a vitamin deficiency. Hitting walls can cause deformities. Some fish are surface oriented. Water quality is seldom an issue.

CDFW update (Valerie Taylor):

Budget

- Gillnet contract has been signed and executed
    - Terms of contract: September 2016 – December 2017
    - $85,000 but additional funding has been requested
        - Request for $113,000 for 4 months of sampling instead of 3
- Reduced amount of wand repair contract from $4,000 to $2,000

Evaluation

- Draft will be complete at the end of this week
- Report meeting will be held on December 6
    - CDFW, HSWRI, SeaGrant, and the SAC chair will participate
    - Discuss questions, issues, comments on first draft

Coastal Development Permits

- Changed to waivers on July 14
- Includes San Diego, Catalina Seabass Fund, Channel Islands Harbor, Newport, Huntington Harbor, Marina del Rey, Agua Hedionda
- Additional species have been pulled from the application for Hubbs' Catalina pen allowing the waiver to move forward to the Coastal Commission for approval

Discussion

Mark Drawbridge: Authorization to put other species in the Catalina cages has been put off because of permit issues. Species such as halibut and yellowtail can help bring in additional grant money. This waiver process is new. Something that's been a topic of discussion for many years is who makes these decisions? If OREHP changes species, will this be an issue again? Will it be another ten year process? This unique location is being underutilized. Feed studies, for instance. We could be doing a lot more, but are unable to get authorization and have to jump through hoops.

Bill Shedd: **I'd like to make a motion that CDFW work to provide leadership and provide permitting for the program to expand the use of Catalina growout pen for other species.**

John Riordan seconds the motion.

Dallas Weaver: Expand that to a universal experimental facility. Researchers looking at net cages and design.

Tom Barnes: The proposed amendment is intriguing. The Department is responsible for OREHP. The Department wouldn't be involved in other activities. There is a mismatch between OREHP and other uses which is outside the scope of the Department. This permitting is the under the purview of the California Coastal Commission not the CDFW. There is huge value in having the waiver in place. Let's look at the evaluation, not put the cart before the horse, not speculate. We haven't had these discussions yet. It would be nice to know what we're dealing with first.

Valerie Taylor: The [Coastal Development] permits are in the name of HSWRI - they would take care of it. The Department is still co-applicant on the growout pens.

Bill Shedd: CDFW should provide leadership and support for Hubbs to allow for experimentation of other species in the Catalina growout Pen. The sportfishing community is driving change and wants the Department to be more of a partner.

Mark Drawbridge: How many layers are needed for approval? We're stuck in the mud with too many layers. Who should be calling the shots on what aspects? Look at the history – experiments at hatchery are okay. White seabass as a standalone, granting agencies are not as willing to fund. Species like yellowtail can help bring in research funding to compliment the OREHP.

Bill Shedd: I'm willing to table this motion if it's not helpful.

Mark Drawbridge: The Program should seek to streamline the process to help take less time. It's not just about the Catalina site but other OREHP sites could be considered on a case-by-case basis.

Tom Barnes: The Department has done what we can with the resources available to make the program a success. California Coastal Commission is on the verge of approving waiver. Not up to me to decide what the California Coastal Commission thinks is necessary.

Mark Drawbridge: Table the motion until next time.

The motion is withdrawn by Bill Shedd.

Next Meeting will be held in April 2017