Ocean Resources Enhancement and Hatchery Program Scientific Advisory Committee Meeting Minutes

Date: Tuesday, May 2, 2023
Time: 10:00 a.m. – 1:00 p.m. (PST)
Location: Microsoft TEAMs Video Conference only

Attendees:

Ocean Resources Enhancement and Hatchery Program (OREHP) Scientific Advisory Committee (SAC) members: Lee Blankenship; Ken Cain, Ph.D.; Tanya Darden, Ph.D.; Mike Franklin, Ph.D.; Jackson Gross, Ph.D.; Ken Leber, Ph.D.; Kai Lorenzen, Ph.D.; Matt Powell, Ph.D.; Nicole Williamson; Greg Wiens, Ph.D.; and Ron Zweig.

OREHP Advisory Panel members and alternates: John Balotti, Jojo Pemberton

California Department of Fish and Wildlife: Adam Frimodig, Kathryn Johnson, Kirsten Ramey, Valerie Taylor

California SeaGrant: Theresa Sinicrope-Talley, Ashleigh Palinkas

Guests and Members of the Public: Mark Drawbridge (Hubbs-SeaWorld Research Institute [HSWRI]), Ruari MacNamara (HSWRI), Mike Rabe, Ellen Reiber, Mike Shane (HSWRI)

Genetic Study Reviewers: Michael Tringali, Ph.D. and Mark Christie, Ph.D.

1. **Introductions and announcements**

   Ron Zweig and Valerie Taylor

2. **Discussion and vote of August 23, 2022, and February 22, 2023, meeting minutes**

   Ron Zweig and SAC

   - August Notes
     - Hatchery contribution estimates from coded wire tag information are not based on modelling but are a simple and direct calculation based on the percent of tagged fish collected through fishery dependent sampling of adult fish.
     - Estimates of hatchery contribution from juvenile sampling may be higher than the adult contribution because some sampling sites are relatively close to release sites and hatchery fish might be collected before they are widely dispersed.
     - Discussion about editing previous notes, but SAC agreed to keep the minutes as is to accurately reflect what happened at the meeting.
     - Chair Ron Zweig confirmed that a quorum is present
     - Motion to accept the August meeting minutes (Ken Cain and seconded by Tanya Darden)

    - Call for vote; motion passed unanimously (10 yays)
- February Notes
    - Motion to accept February minutes (Tanya Darden and seconded by Nicole Williamson)
    - Call for vote; motion passed unanimously (10 yays)

3. **Discussion and vote on amended SAC Bylaws**

   Valerie Taylor and SAC

   - Discussion on changing the bylaws to reflect the increase from 4 to 6 votes for a quorum
   - Valerie will ask legal if having a number is required in the future
   - Motion to accept the bylaws (Ken Leiber and seconded by Greg Wiens)
   - Call for vote; motion passed unanimously (10 yays)

4. **Receive and discuss California Department of Fish and Wildlife and HSWRI Research and Administrative Priorities List for the OREHP**

   Valerie Taylor and SAC

   - Department and HSWRI staff met to discuss program goals and funding needs
       - Working document of priorities created based on 2017 Evaluation Report and HSWRI's 5-Year Plan:
           - Broodstock collection
           - Genetics research
           - Fish ID (CWT)
           - Communication and Collaboration; bi-annual meeting with SAC, HSWRI and CDFW, OREAP
           - Health management
           - Post-release assessment
           - Population modeling
           - Adaptive management
   - Mark Drawbridge- HSWRI is available to make a presentation on how the OREHP is being run if members of the SAC are interested
   - Valerie Taylor is working on getting paperwork completed to allow for SAC members to get paid for their travel for an in-person meeting

5. **Discussion of SCDNR's additional analyses of genetics study to quantify the level of false assignments associated with the method when used to assign mixed samples of wild and hatchery fish**

   Tanya Darden, Ph.D., Michael Tringali, Ph.D., Mark Christie, Ph.D., and SAC

   - Kai Lorenzen gave a brief summary of reviewer comments and additional analysis report provided by SCDNR,
       - Overall approach was deemed suitable and well implemented for identifying released hatchery fish and determining wild white seabass population structure and characterizing genetic health.
       - Concern over the method used to assign parentage in mixed samples that it may result in substantial mischaracterization of wild fish as hatchery fish

    - Additional analyses conducted by Tanya Darden and Ellen Reiber:
        - Simulated wild white seabass population using randomly selected 456 fish as broodstock and 622 as “wild” samples. CERVUS protocol provided very few false assignments.
        - Unable to randomly assign “wild” samples to broodstock and samples as requested since many of the “wild” samples were incompletely genotyped. Analyses approximating the request resulted in high rates of false assignments for incompletely genotyped samples.
        - Analysis of 280 mostly incompletely genotyped samples from known hatchery-origin samples resulted in a high rate of false rejections. A high proportion of these samples were genotyped at 10 loci or less.
- Tanya Darden – verbally disagreed with Kai’s summary presentation as it did not accurately reflect what was stated in the report.
- Tanya Darden – given the incomplete genotyping, the rates of false assignments aren’t that high. Normally, parent-pairs are used, but in this study, single-parent assignments were also used due to missing genetic samples of all hatchery broodstock.
- Mark Christie – Possible interpretations of the much higher hatchery contribution results in the genetics study:
    - If the assignments are correct, then 28% of the “wild” white seabass samples tested were of hatchery origin – this is a lot and worth thinking about. How much of a hatchery contribution do you want in the wild population?
    - The samples of the “wild” white seabass are not representative of the natural wild population (perhaps some hatchery fish are mixed in with these samples).
    - The false parent-offpring assignments is increasing the percentage of the contribution estimate.
- Mark Christie ran some simulations by creating 1,000 data sets with 50,000,000 individuals each and used trios. The results indicated that the number of mismatching loci affects the number of false parent-offspring assignments.
    - If there are 2 or more mismatches, it is almost impossible to distinguish them from those matching by chance alone. If there are no mismatches, it gives the highest probability that the match is not by chance alone.
    - Tanya Darden – CERVUS knows what allele frequencies are and builds that into critical delta scores used in the actual parentage model. Set the confidence level very high in the initial model.
    - Discussion of base rates, other simulations that could be used, other models and minimum number of loci needed.
- Tanya Darden – the estimate of hatchery contribution in the initial study should be taken for what it is: an estimate. There are errors in this dataset, but what it does show is that there are more hatchery fish out there than we thought. What’s next? Switch the focus to the question you want to answer with good samples on all sides. Save the model and use it for when you have completely genotyped broodstock families and better wild samples.

6. **& 7. Formulate SAC conclusions regarding SCDNR genetics study, and discussion of implications of SCDNR genetics study and development of next steps**

- The OREAP has put together a motion about using funding for a genetics study for the next fiscal year depending on what the SAC advises.
    - The SAC is required to present a report to the Legislature by 2027, so this must be kept in mind when deciding which questions to ask and how long a study is recommended.
- Kai Lorenzen makes the suggestion to use the existing microsatellite panel with a different model, fishery dependent sampling of wild fish and assessing the contribution rate. Another thing of note is that there aren't any juvenile sampling surveys being conducted right now.
- Ken Leber – What would the public like to see? What is the contribution rate of the hatchery to the fishery? Updating the sampling to include genetics in addition to coded wire tags. Recapture studies can give lots of valuable information on dispersal and survival but because we don't have that sampling program anymore, how do we look at release strategies?
- John Ballotti – expectations of the OREAP are: 1) What is the contribution of the hatchery program and how will that inform the Request for Proposal for future genetics study? and 2) Is it worth what we're doing? Is it successful or not?
- Tanya Darden does not support or see the value in development of new parentage model. We won't have all the parent genomes. She suggests doing aging work to look at contribution to different age classes and a juvenile sampling program to get answers more quickly.
- Mike Tringali – the Bayesian model published in 2006 could be extended to single-parent assignments.
- Discussion of budget issues
    - Not enough money to make all the improvements to the program that were suggested by the Evaluation in 2019.
    - Next OREAP meeting is scheduled for June - will likely be requesting an increase in spending authority (effective FY 24/25)
    - Budgeting subcommittee is trying to plan out the next 4 years
        - Not enough information to move forward on requesting additional funding because the SAC hasn't yet identified priorities.
        - When asking for additional funds, it's best to provide the Legislature with specific projects and spell out exactly how the money will be spent to increase the likelihood of the request being approved.
        - Kai Lorenzen - the SAC is getting closer to being able to define what is needed for the RFP. Agrees that a different model or fully genotyped tissue samples might allow for a more reliable estimate of hatchery contribution. Concern with rushing forward without taking time to fully vet these results.
- Discussion about sampling
    - Should fin clips be collected instead of or in addition to scanning heads?
        - For now, might be best to try and collect tissue samples only from fish that have also been scanned.

        - Need to be able to connect the sample to the outcome of the scan (tagged or no?)
        - HSWRI's plan for this summer is to continue scanning fish for CWT but also sending tissue samples of all fish whether tagged or not to South Carolina.
- John Ballotti – Does the SAC feel that there is enough information to develop an RFP? If yes, what will be that process and if no, what else is needed?
    - Tanya Darden, Michael Franklin, Kai Lorenzen, and Matt Powell volunteer to form a sub-committee
    - Valerie will contact these members and schedule a call for RFP development.

8. Public comment on agenda items and closing of meeting

Valerie Taylor and Ron Zweig

- No public comments
- CASG have completed the first part of their contract with CDFW
    - CDFW will finish reviewing the situation analysis and post on Teams for the SAC to review.
- Valerie Taylor will send out Doodle poll to schedule the next meeting to discuss the contract, the situation analysis, and next steps.