

September 28, 2015

Monterey Bay Salmon & Trout Project  
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To: Brian Ashton  
ARED  
730 Case Avenue, Box 406  
Wrangell, AK 99929

Brian,

I wish to express my gratitude for your creation and production of Moist Air Incubator Units. Becoming familiar with their use during my time with US Fish and Wildlife Service while in western Washington state, I have been using one of the prototypes at Monterey Bay Salmon & Trout Project's Kingfisher Flat Genetics Conservation Hatchery near Davenport, California since October, 2011.

Due to our state's CEQA restrictions, our facility cannot apply prophylactic chemotherapeutic treatments (formalin, hydrogen peroxide) for prevention or control of parasitic aquatic fungus on developing salmonid eggs. Prior to use of the MAI, eggs were incubated in hatch jars which are historically used for catfish eggs, not salmonid eggs. The primary reason hatch jars were used was that with some fine tuning of upwelling flow, enough current could be generated to mildly turn eggs within the jar, not allowing fungal spores to seed and hyphae to grow and spread. Conversely, flow in jars had to be kept below a threshold that would not kill developing eggs with excessive agitation. This strategy did not always stave off all infestation and losses from smothering of healthy eggs by PAF occurred every season.

The hatchery conducts husbandry activities for two species; coho salmon and winter steelhead. Coho are federally listed "endangered" and ours is the only facility south of the Golden Gate Bridge capable of contributing to recovery of the species in the central California coast ESU, through artificial propagation. Being so critical, operations at the hatchery have to optimize survival from fertilization to release to the highest extent possible. The best foot forward to achieving that goal is to maximize survival from fertilization to emergent-fry stage and the MAI has done its job.

Consider the following:

- Prior to use, survival rate of coho during early egg incubation (fertilization to eye-up stage) was routinely below 10%.
- Since installation and use of the MAI, survival of coho eggs from fertilization to eye-up stage has averaged 63.58%.

A significant improvement, as you can discern, and an upward trend our operations intend to continue. It is clear to staff at our facility that this improvement would not have occurred if the MAI were used. Thanks again and you have my permission to share this with other interested parties.

Best regards,

Mark E. Galloway  
Hatchery Manager