joe breskin

Added comments from Olympic Envidronmental Council on Burrowing Shrimp SEIS

There are several levels at which the economic analysis discussions to date have failed to address one of the most important realities now facing growers. No analysis is prepared to address the consequences to growers, especially the very different consequences to growers in different areas and growers using different methods, if the market wakes up and rejects the selection of poisoned shellfish that they are offering. It is the same sort of problem that will soon be facing the farmed salmon folks. But in the meantime, enormous damage is being done by the pollution, the parasites and diseases still being released from salmon farms that never should have been permitted in the first place.

DOE now has had to reevaluate and consider reissuing the permit that the growers “pulled” in the wake of public outrage and restaurateurs' panic when it was revealed that the Bay that had been getting poisoned with a now-banned neurotoxin - Carbaryl - that had lost its EPA registration, and was about to get dosed with a replacement a neurotoxic neonic called Imidacloprid.

What they did NOT want the public to know was that the mudflats where the non-native Pacific Oysters are grown had been getting sprayed with this stuff since 1963, and that the stuff - delivered from helicopters as a wettable powder - drifted great distances and poisoned its way up and down the entire food-web, killing or damaging everything with a nervous system from sand fleas to salmon, as well as birds and bees, and although they describe spraying “empty” oyster beds in sequence, like a crop rotation, the stuff is aerial sprayed on mudflats at low tide and drifts significant distances, affecting everything alive, and since 1984 they have sprayed directly across active oyster beds. Drift floats on the incoming tide and covers thousands of additional acres of water column beyond the target areas and dying creatures struggle to the surface to die where they are picked up and carried off by gulls crows and smaller shorebirds: dowitchers, dunlins, plovers, turnstones. and whimbrels.

Imagine the impact of a boycott movement and widespread media exposure of the "big lie" they have been telling about Washington State's pristine waters. Imagine the impact of a story like Tom's River or Silent Spring . Since the lawsuit and settlement agreement, Growers have had over a decade to come up with a plan based on integrated pest management principles, but they squandered the opportunity, presuming they could continue to bamboozle agencies, and evade regulation, by pulling strings with electeds and hiring scientists to develop papers and positions that clearly and deliberately mislead and ignore the most obvious of facts.

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I will list several examples of how the “bad science” that has been produced to support false premises or to opportunistically leverage or distort facts was used to support fundamentally erroneous narratives and to produce a Supplemental Environmental Impact Statement that once again, like the Draft and Final EIS documents that preceded it, has failed to address the obvious or meet the standards necessary for serious review.

From my POV it is the job of agencies and agency scientists to provide a level of review that justifies public confidence in the objectivity of their review. But over the past 40 years, we have rarely seen that applied to the problems in Willapa Bay or in Hood Canal, where shellfish growers have doggedly demanded to be allowed to continue to poison literally millions of native creatures a year - which they do, permitted or not - from the Shrimp that the Gray Whales Feed on, to the Dungeness Crab and waterfowl, hoping to some new combination of poisons will make it possible for them to farm their non-native oysters using “waters of the state” as though they were constructed on-shore aquaculture ponds on private upland plots. And it's a poisoning that for decades has included sub-lethal doses of persistent pesticides administered (by drift) to everything in the water column including oysters, crabs and fish that will either be eaten by birds and other animals, or sold for human consumption.

You folks at DOE are supposed to (and I believe are required to) use “best available science” in your review. It does not require a whole lot of effort to demonstrate that quite a bit of the stuff that you get from Patton and Dumbauld and their friends is simply NOT the best science available at this time.

Example number one, demonstrating fairly significant sampling problems:

“In situations where a habitat category was not sampled for crab on a particular site, crab density values for the missing category were estimated by determining the average crab density for that habitat from other sites during the same sample period.

Direct Approach:

Density/ha was estimated in two ways for data collected during 1988.

For interannual comparisons, the samples were partitioned into the respective habitat categories (or strata) and density/ha calculated as described above.

However, the systematic sampling approach also allowed us to estimate density/ha directly by multiplying the average crab density for all samples by the total number of rn/ha.

“Epibenthic shell is also an important structural component of these estuaries, supporting higher densities of amphipods (Eogarnrnarus octairi), harpacticoid copepods (Dactylopodia crassipes), cumaceans (Cumella vulgaris), crabs (Cancer rnagister and Hernigrapsus oregonensis), and gunnels (Pholis ornata) than bare mudflats dominated by burrowing shrimp (Dory et al. 1990; Armstrong et al. 1992; Williams 1994; Eggleston and Armstrong 1995). Shell habitats consist of commercial oyster culture in both estuaries as well as relic surface deposits (death assemblages) of eastern softshell clam Mya arenaria (Palacios et al. 1994) and intertidal oyster shell habitat mitigation for juvenile Dungeness crabs constructed by the U.S. Army Corps of Engineers (COE) in Grays Harbor (Armstrong et al. 1992; Fernandez et al. 1993; Eggleston and Armstrong 1995; Iribarne et al. 1995). ”

2.3.1 Intertidal Crab Density

Each sample was grouped into one of the five possible habitat categories by site and by trip, to calculate mean density for each habitat category. Crab density data were highly variable, both spatially and temporally. Data did not show normal distribution patterns and variances were not homogeneous, violating the basic assumptions of parametric statistical tests (Conover 1980; Zar 1984).

Subsequent transformations of the data such as log~~ (abundance + 1) did not stabilize the variance, so statistical comparisons were restricted to Mann-Whitney and Kruskal-Wallis non-parametric rank tests. Two-way non-parametric analysis of variance procedures (Zar 1984) were used to test for significance of results from the balanced comparisons conducted during June and July 1987 (see Section 2.2.3). When nonparametric tests indicated significant differences between groups, Tukey-type multiple comparisons were applied to determine where the differences occurred (Conover 1980; Zar 1984). 2.3.2 Density/ha and Site Population Estimates Crab density/rn2 was extrapolated to density/ha in two ways: either by a stratified approach from weighted sampling in the five habitat categories, or by the direct, fully systematic approach (used only in 1988). In either case, “site population” estimates were calculated based on the total area (hectares) of each site (Table 1). It should be noted that all estimates of density/ha or density! site were made under the assumption that the methods used for selecting intertidal crab samples resulted in the collection of quadrat samples which were representative of each habitat type.”

Which I read as in direct contradiction to this:

"2.2.1 Habitat Categories and Percent Cover

In order to minimize potential errors resulting from the visual estimation method, and for purposes of comparison and analysis, samples were grouped into five broad habitat categories (Table 2 and Fig. 5). All samples which had less than 10% of either shell or eelgrass cover were classified within the “open mud/sand” (OP) category. Samples which had oyster shell cover of 50% or greater were classified as “heavy shell” (HS) and any sample which had 10% to 49% shell cover as “light shell” (LS). Samples with eelgrass were grouped in a similar manner. Those samples which had eelgrass cover of 50% or greater were classified as “heavy eelgrass” (HE) and samples ranging from 10% to 49% were placed into the “light eelgrass” (LE) category. The average turion densities corresponding to these two eelgrass categories were: HE = 80 (±34; 1SD) turions/m2 (n = 180) and LE =21 (±18; 1SD) turions/m2 (n = 23). In occasional situations where both shell and eelgrass co-occurred within a quadrat, samples were assigned to the appropriate cover category of shell because of evidence presented by Armstrong and Gunderson (1985) and Dumbauld and Armstrong (1987) indicating that shell supports higher long-term densities of crab than does eelgrass."

Now, please think about what you just read. Read it again. I believe that it clearly states that some of these samples were assigned to a different category of habitat than what was actually observed, in order to support a prior observation or hypothesis. They shouldn’t have been where we found them, so when we logged them, we put them where they belonged, is how I read it.

Here is more information that ought to be in the discussion:

"Juvenile Dungeness crabs in Willapa Bay (WA, USA), a typical large northeastern Pacific estuary, can occur at densities so high that they must migrate to intertidal zones to forage because the subtidal prey biomass alone cannot meet the energetic demands of the crabs (Holsman et al., 2003). In a study from September to December 1979 in the SFE, juvenile Dungeness crab stomachs were, on average, approximately half-full, and 5% of crabs had completely empty stomachs (Wild and Tasto, 1983).

Starved adult Dungeness crabs will spend more time foraging at high temperatures than well-fed crabs, suggesting that crabs in poorer condition will seek stressful environments for food (Curtis and McGaw, 2012). Whether food limitation impacts the physiological sensitivity of juvenile Dungeness crabs to acute thermal stress and upper temperature tolerance is unknown but likely, given the pervasive effects of temperature on crustacean physiology (Whiteley et al., 1997, 2001).

Furthermore, food limitation has been shown to affect both the physiological response to stressors (e.g. hypoxia, McGaw,2005; temperature, McGaw and Whiteley, 2012) and temperature preference in adult Dungeness crabs (Curtis and McGaw, 2012). If food limitation impairs the stress tolerance

of juvenile Dungeness crabs then there are important physiological trade-offs to consider if hungry crabs are more likely to enter a stressful environment to forage for food during a critical development stage.

Currently, it is unknown how food limitation affects energy use and allocation in juvenile Dungeness crabs. We evaluated the effects of food limitation on physiological performance and acute thermal tolerance in juvenile Dungeness crabs caught in the summer and winter in order to gain a better understanding of how changes in aerobic metabolism affect energy (i.e. ATP) supply and the energy allocated to basal

maintenance compared with aerobic scope functions (Sokolova et al., 2012). As Dungeness crabs spend ?1 year in the SFE, it is important to examine the effect of food limitation across seasons to determine whether crabs are more vulnerable during a particular developmental lifestage and/or during a particular time of year. The experiments were designed to answer the following three main questions.

(i) How does food limitation affect juvenile Dungeness crab energy demand as measured by growth (e.g. changes in weight, carapace width and moulting frequency), basal heart rate (i.e. circulation) and aerobic ATP supply,through measures of basal oxygen consumption rates and aerobic capacity of metabolic enzymes?

(ii) How does food limitation affect upper temperature tolerance and temperature sensitivity of juvenile

Dungeness crabs, as measured by upper critical thresholds in cardiac function, cardiac performance curves and oxygen consumption rates during thermal stress?

https://academic.oup.com/conphys/article/3/1/cov013/2571234

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Conservation Physiology, Volume 3, Issue 1, 1 January 2015, cov013,https://doi.org/10.1093/conphys/cov013

Now, let’s look at the the IPM development debacle. Start with the Knowledge area: biological control of pests affecting plants. Perhaps that builds on the bizarre relationship the shellfish growers in washington state have with the tax code. Based on the premise that because they do not attempt to escape that they are plants not really animals? Let’s get real, please.

“This research was funded by the US Department of Agriculture, Agricultural Research Service (CRIS project

5358-63000-002-00D).

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CRIS project 5358-63000-002-00D).

?https://portal.nifa.usda.gov/web/crisprojectpages/0409869-integrated-pest-management-practices-for-pacific-shellfish-production.html

Knowledge Area

215 - Biological Control of Pests Affecting Plants ;

Source: AGRICULTURAL RESEARCH SERVICE submitted to

INTEGRATED PEST MANAGEMENT PRACTICES FOR PACIFIC SHELLFISH PRODUCTION

"Goals / Objectives

Objective 1: Identify critical stages in the life cycle of burrowing shrimp in West Coast estuaries that are vulnerable to control measures for aquaculture operations. Objective 2: Map aquaculture operations, eelgrass beds, and burrowing shrimp populations at an

estuarine landscape scale and conduct a spatial analysis in order to quantify the interaction between oyster aquaculture practices, fish utilization of these estuarine habitats as predators and parasite hosts, and burrowing shrimp recruitment and movement.

Project Methods

Conduct research in marine/estuarine ecology to develop new and sustainable approaches to controlling pests and predators such as burrowing shrimp, spartina, crab, drills and diving ducks. Using a systems approach, examine key management practices and their impacts on ecological components of complex, dynamic estuarine environments. Establish a clear understanding of the ecology and biology of key pests and predators that impact reproduction, survival and overall population dynamics. Identify and evaluate potential biological control agents for efficacy in an integrated pest management system. Develop a multidisciplinary approach in collaboration with ARS, Oregon State University, and EPA scientists located at the Hatfield Marine Sciences Center, Newport, OR, and elsewhere as needed. Work with outreach and extension personnel/groups to transfer technology to growers. FY03 Program Increase $223,537. 1 SY. FY04 Program Increase $120,783. Replacing 5358-63000-001-00D (7/05)."

I applauded the initial statement from DOE that they would have to deny the permit because it failed to adequately address the risk the proposed practices posed to the larger ecosystem, but what has happened since then concerns me enough to write this second round of comments.

As near as I can tell, granting a permit is an “agency action” and as such requires the level of detail that has been developed on the DOE website. But denial of a permit is NOT an agency action that requires this level of documentation to be published. It is my hope that this detail was developed in an interest of driving future discussions to address the realities of the ecosystem, in which case the information we have provided in these and our previous comments: about flaws in the analysis provided by growers, the crabs’ utilization of the intertidal zone in Mclean, and the manner in which rhizome mats of the eel grasses have constrained shrimp habitat, should be critical.

?Prior comments we submitted 11/1/2017

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Comments on SEIS from Olympic Environmental Council

We are a 501c3 organization in Washington State that is concerned with protection and preservation of natural systems. We serve as an umbrella organization for other organizations and groups dedicated to defending natural systems. Historically, we have been active in this arena for over 25 years since the dawn of GMA process and have had to appeal several bad agency decisions.

I am sure we will not be alone in noting that absurdity of permitting non-lethal levels of insecticide, and the inevitability that this approach will predictably fail to address the deep systemic problems that the industry and the agencies have created over the past 50 years, by focusing in single issues w/o considering to potential scale or importance of the unintended consequences of the actions taken to protect an industry that is based on entirely unsustainable methods and on fundamental misunderstandings of ecosystems.

First things first: if we look at this as an ecosystem, the burrowing shrimp have coexisted in balance with the oysters in Willapa Bay forever. They have been in the estuary at high population levels since before the last ice age. If population of a single species appears to be increasing rapidly the first question that needs to be asked is "Where?" And the second question is of course "Why?" The answers to both of these questions point to a long history of gross negligence by the shellfish industry.

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At the turn of the century self-serving exploiters basically strip-mined the estuary and destroyed the shell reefs that had supported the oysters, kept the shrimp out of oyster territory, and kept aragonite levels in the water column ideal for oyster propagation. Since then, almost everything that has been tried has had the appearance of a macabre comedic sort of rolling catastrophe. Growers introduced numerous invasive species, each of which has complicated the situation. They introduced japanese oysters, whose means of reproduction is poorly suited to the chemical conditions in the estuary, manila clams, oyster drills, spartina, and japonica. And someone introduced the isopod parasite that is currently driving the mud shrimp to the verge of extinction on the west coast.

Historically, mats of japonica rhizomes supported vast populations of migratory waterfowl. The stuff has been called 'duckgrass' for a very long time, because ducks and geese eat the blades, roots, or both. American Wigeon, Northern Pintail, and Mallard are the three main species of ducks that eat duckgrass on Willapa Bay. These ducks are dependent on duckgrass to survive; in fact the Wigeon's diet consists of more plant matter than any other dabbling duck. The Northern Pintail is considered a common bird in steep decline.[ii] The Dusky, a goose, eats both duckgrass and marina, and on paper, the Dusky is a protected goose, due to low a population.There are several species of migratory geese that are almost totally dependent on it being here and when they fly into Willapa Bay expecting to feed and fatten for their migration, they now find barren defoliation. This is genuinely life threatening: they simply cannot survive a mistake of this magnitude. But it is not the ducks' mistake, it is the mistake of Washington State that is permitting the destruction of duckgrass and marina with Imazamox.

Since the 1980's scientists have consistently reported (see feldman 2000 review paper and excerpt below) that eelgrass keeps shrimp from burrowing in the areas where it grows. The eradication of japonica has now damaged or destroyed both species of eelgrass (marina and japonica) over vast areas of Willapa Bay and opened those areas to shrimp. The wholesale destruction of Eelgrass using the herbicide Imazamox not only reduced the shrimps' predators, who used it as habitat and hiding cover, it removed a key physical constraint - the mats of rhizomes were an obstacle to the shrimps' burrows and the destruction of the Eelgrass (to support another introduced invasive species: Manila Clams) has allowed the shrimp to move into (and stake “claim” to) vast areas where they could not live when the Eelgrass was there. "Field surveys have been consistent with Brenchley's (1982) findings, noting the abrupt decline and low densities of ghost shrimp burrows in Zostera rnarina beds compared to adjacent intertidal mudflats (Swinbanks and Murray 1981; Swinbanks and Luternauer 1987). Harrison (1987) reported that an expansion of Z. marina and Zostera japonica habitat was accompanied by a corresponding reduction in ghost shrimp density."

So now the industry want to poison the sediments with a different neurotoxin in an effort to paralyze the shrimp so that they will suffocate in their burrows.

A lawsuit brought against the state and industry by citizen activists to end the use of carbaryl resulted in a hard won settlement agreement with the Willapa Bay Grays Harbor Oyster Growers Association. This agreement called for the phase-out of carbaryl and gave the industry over a decade to develop and adopt an integrated pest management plan to replace their unsustainable pesticide-based shrimp control measure. This settlement agreement was based on a serious legal challenge from citizens -- not the state -- against ecosystem scale contamination. It is not what the industry PR machine is now pretending was a voluntary phase-out based on some sort of magic wand of enlightenment among the growers: they kept spraying year after year and spent hundreds of thousands of dollars (largely financed using state and federal public funds) exploring alternate chemical approaches rather than embracing non-chemical approaches to restore ecosystem balance.

During that 10 year negotiated phase out, the National Marine Fisheries Services determine in 2009 that the application of carbaryl in both Willapa Bay and Grays Harbor jeopardized the continued existence of endangered salmon and adversely affected or destroyed their habitat. Also in 2009, the NMFS determined the application of carbaryl adversely affected ESA listed green sturgeon in these same bays. The spraying continued unabated. A great deal of public money was spent exploring chemical means to control a native animal species whose growth has been facilitated by destruction of a native plant species. As far as we can tell, the use of USDA's IPM funds to develop a pesticide based approach to destroy a native animal species in support of a non-native animal species is entirely unprecedented, and is especially disturbing in the face of the population collapse of the native mud shrimp that is currently underway.

It is not clear if, or when, or how the required IPM was actually adopted, but it is very clear that almost none of the usual principles of IPM are involved in the latest pesticide permit proposal. The DEIS to which this EIS and SEIS is attached is deeply flawed, because it fails to address the complex interactions between species. For example, the estimates for incidental take of non target organisms are just plain wrong, and the role of crabs as oyster predators is not discussed, but millions of

Because the pacific oyster spawns into the water column, and the initial layer of shell is developed in the water column, rather than under controlled conditions inside the female oyster, as occurs in the olympia oysters that were native to these waters, water conditions are critical, if shell building is to proceed properly. In an effort to control this process, and to allow the propagation of sterile triploid oysters, the industry adopted a hatchery program to supply seed. Mismanagement of the hatcheries and misunderstanding of chemical processes involved in shell building led to the claim that ocean acidification was destroying oysters and that pacific oyster was the canary in the coalmine for ocean acidification. This was an interesting story and it played well in the press, and continues to be played by politicians, but it was based on both a serious misunderstanding of water chemistry and a willful convenient falsehood.

The real problem is that unlike the native oyster, in the waters of the pacific northwest, the pacific oyster is near the edge of its natural range and its means of reproduction in the water column is only suited to chemical and temperature conditions found in these water some of the time. When those conditions are not present, shell-building in the first 48 hours is compromised.

It is a very human trait to assume that every year is pretty much the same as the ones before it, but this assumption leads to human development along unstable slopes and riverbanks that move and so the development gets wiped away when weather conditions drift outside the normal range. Same with the oysters. Water conditions 80 years ago were perfect for them. Since that time, vast tracts of forest in the watersheds that feed the estuaries have been removed, potentially altering the pH of the water entering the estuary, the eelgrass in the bay has been eradicated, and the ecological balance has been drastically altered by ground culture methods that involve dragging the bottom of the bay with chain dredges and harrows, stirring up sediments.

We also see a very serious issue emerging in that the primary proponent of the pesticide approach has been found to be in violation of the state's ethics rules. It appears to us that the ethics board may actually have failed to follow the rules set forth in the APA that appear to us to call for agency actions taken on the basis of ethically compromised testimony to be revisited. The key presenter and salesman for this new pesticide and its permit has been censured and fined by the ethics board for his involvement with the industry [] which should raise serious concerns for agencies who have relied on his testimony and sales pitches. Joe Breskin Olympic Environmental Council Port Townsend, Wa.