Notes on *Bird Interactions with Shellfish Aquaculture* Webinar

By Robert Rheault

There are several ways in which birds interact with shellfish aquaculture. We can break these down to a few major topic areas:

1. Birds can cause significant damage to crops through predation.
2. Some birds fall into the category of protected resources and farmers have been variously accused of interfering with foraging, attracting, disturbing or interfering with hunting.
3. Birds can be attracted to aquaculture structures for roosting or foraging and their guano can impact water quality and trigger the need for growers to develop management plans under the National Shellfish Sanitation Plan.

On February 17, 2021, USDA's Wildlife Services program coordinated a webinar to discuss some potential mitigation measures that growers might consider using to address these issues. A flock (couldn't resist) of personnel from USDA WS joined the webinar to discuss some of their research efforts associated with bird predation on catfish farms, as well as the spread of pathogens between farms by avian predators, and some of the mitigation measures that they have developed. USDA WS has programs to address a host of wide-ranging issues, including: rabies control, feral swine management, bird strikes at airports and mitigation of crop damage. Their experts described programs they have dealing with everything from deterrents and repellents to depredation permits.

Included on the call were:

Brian Dorr, Research Wildlife Biologist, brian.s.dorr@usda.gov

Fred Cunningham, National Wildlife Research Center Field Station Leader, MS, fred.l.cunningham@usda.gov

John McConnell, Assistant Eastern Regional Director, john.e.mcconnell@usda.gov

Willie Harris, Eastern Region Director, willie.d.harris@usda.gov

Bill Dewey, Director of Public Affairs for Taylor Shellfish, billd@taylorshellfish.com and I bob@ecsga.org were on the call to describe the issues the industry is facing and a wide-ranging discussion followed discussing a variety of potential solutions that our industry might consider.

Crop Predation Concerns

Bill Dewey and I described how diving ducks can devastate unprotected clams and mussels – with some species diving in excess of 60 feet to consume their body weight in shellfish. Growers have learned to protect seed clams and mussels with barrier netting to avoid mass mortalities caused by large flocks of scoters, eiders and other diving duck species.

Protected Resources Concerns

The Red Knot is a small bird with an epic migration that takes it from the Arctic to Argentina. Along the route many stop in Delaware Bay to feast on horseshoe crab eggs to fuel their migration. When the Knot was listed as threatened, concerns were raised that oyster farmers were disturbing foraging behavior, and several oyster farms were forced to move.

In Rhode Island there have been cases where proposed leases have been blocked by resource managers concerned that a site is prime black duck foraging habitat as well as a preferred location for duck hunting.

Since California brants feed on eelgrass, been concerns that oyster farms were impacting eelgrass successfully blocked farm expansion requests and even forced some farms to move or reduce acreage.

During the webinar, Wildlife Services recommended checking with your state wildlife agency and the U.S. Fish and Wildlife Service office in your region for guidance on acceptable harassment or mitigation measures, as well permitting requirements that may be necessary for management activities involving threatened or endangered species.

While deterrents are not the same as “takes” when it comes to endangered or threatened species, some resource managers may still take exception if iconic or protected species might be negatively impacted by a proposed farm’s proposed deterrents.

Of course, we rarely get credit if our activities enhance foraging opportunities.

Water Quality Concerns Associated with Roosting Behavior

A large part of the webinar focused on the tendency of birds to perch on floating or suspended aquaculture gear and relieve themselves on the gear and into the waters nearby. The National Shellfish Sanitation Plan Aquaculture chapter was recently edited to mandate that “farms that may attract birds or mammals must develop management plans” to mitigate the impacts of these animals on water quality. Since our water quality monitoring program is based on the measurement of indicator coliform bacteria, and coliform bacteria are present in all warm-blooded animal feces, many growing areas are closed to harvest (either seasonally or year-round) because of the presence of large numbers of birds. The NSSP Model Ordinance is very clear that if the coliform count in a harvest area exceeds the criteria, then the harvest area needs to be changed to closed, restricted or conditional.

Floats and posts are an attractive place for many birds to perch, and the highly visible guano splotches on black floats have been a cause for concern since floating gear such as the OysterGro started to gain popularity. One group of farms located near a rookery on Long Island was particularly impacted by large numbers of cormorants and gulls, triggering heath officials to sample shellfish meats and water

quality, and forcing them to close down these harvest areas and mandate that growers develop mitigation measures.

Potential Mitigation Measures

A range of mitigation tools was discussed. Shooting the birds or repelling them with cannons or pyrotechnics was ruled out since most of these farms are inshore and within view of many coastal waterfront homes. Some of the species of birds we are talking about are also protected resources. A wide range of other repellents were discussed. Green lasers and drones were ruled out as likely too expensive. Scare kites have been effective at certain sites, but they need to have the right coloration and must be moved periodically or the birds will acclimate to their presence. They may also get shredded by several days of high winds.

Streamers (reflective mylar ribbons) and gull sweeps have proven effective for some birds, but they certainly pose an issue when you try to flip the gear, and they are not effective on calm days. Most growers recognize that almost anything that you attach to the top of the float will probably make it more difficult to flip the cage.

Perhaps the simplest solution is the use of very long zipties with the tails sticking up to serve as “ticklers” that appear to keep most bird species away from floats. We need to determine the optimal spacing and length of ties needed on each float, and whether the ties will repel small birds as well as big ones. The solution appears to be cost effective, but questions remain about whether the birds will eventually acclimate to the tickers as well. Growers are also wary of the potential for the creation of additional plastic debris.

Alternatively, making the floats tough to stand on could be an avenue to explore. You have all probably seen the cones that are common on dock pilings that seem to deter birds from roosting. Making floats that come to a similar point or narrow ridge should have a similar effect. We are hoping to do some research to verify that this is an effective deterrent before investing in new float molds.

Bill Dewey described an experiment that was done to deter diving ducks using the sound of outboard motor boats broadcast underwater. The approach seemed effective at deterring duck predation on clam flats.

Wildlife Services discussed the potential use of ultrasonic repellants, but they cautioned that birds hear the same wavelengths of sounds that we do, so they did not seem optimistic that this would work. They also described the effectiveness of broadcasting bird distress calls. Apparently, this can work, but you need to have the recording of the right species in distress for it to be effective, and the birds may eventually acclimate to the sound.

Conclusions

At the end of the day, it is pretty clear that we have a wide variety of gear types, and an even wider variety of birds. It is unlikely that any single solution is going to be effective for all sites and all gear types.

We don't have any evidence that shellfish exposed to guano have been associated with illnesses, but that doesn't mean there have not been any. The FDA wants us to address the issue, and certainly the optics of the matter are something that needs to be addressed.

The ISSC Aquaculture Subcommittee should develop guidance for the states to make suggestions on how many birds are too many, and when growers need to propose mitigation measures. If you have a few birds over a large area and strong tides it is less of an issue than lots of birds in a small area. In many cases the bird issues are seasonal and last only a few weeks while birds are migrating though. In some areas, issues are severe and year-round. At this point we don't have any guidance for state regulators unless the water-quality standards are exceeded.

As an industry we will also need to work with the ISSC to develop re-submergence protocols for severely impacted product. We have guidelines for *Vibrio* re-conditioning after thermal abuse, as well as guidance for product that has been impacted by raw sewage spills from a wastewater treatment plant. We also know that coliform counts can be reduced by as little as 48 hours of depuration. But we don't yet have recommendations for bird-impacted products.

We are pleased that Wildlife Services has engaged with our community to try and help us devise some mechanisms to minimize negative interactions with birds. They bring a wealth of knowledge to the table and have substantial resources to help us study potential mitigation measures. We are looking forward to continuing this dialog in order to continue to develop novel approaches.

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