Northwest Aquaculture Alliance

FACT SHEET ON PERMIT MODIFICATION

September 2020

SITUATION

The Washington State Department of Ecology (ECY) is currently evaluating the request by Northwest Aquaculture Alliance (NWAA) member, Cooke Aquaculture Pacific (CAP), to modify its existing permits to allow the company to switch the species under culture from Atlantic salmon (*Salmo salar*) to triploid rainbow trout (*Oncorhynchus mykiss*), also known as steelhead.

The stakes are high. The agency, which previously sought public comment on the original permit modification request, is now seeking FINAL public comments on the revisions it has made to the original water quality permits.

While ECY has determined, based on the scientific evidence that was submitted during the last comment period, that switching species "would not change potential impacts on water quality," it has nevertheless drafted additional requirements upon which the public has been invited to comment. This draft language covers potential escapes, monthly reporting on fish consumption, requirements on net maintenance, and a requirement that CAP "study new technologies and propose alternatives that reduce waste from feed."

Based on the campaign against aquaculture in general and CAP in particular, expressed during the previous comment period that ended June 8, 2020, NWAA expects that, once again, special interest groups and individuals who don't want fish farms in their "backyards" will pressure ECY to ignore science and make a politically driven decision.

We cannot let this happen.

As we know from recent experience, ***what happens in Washington does not stay in Washington,*** and every small "victory" that the anti-aquaculture crowd gains emboldens such groups in other regions and other countries. This is a pivotal moment for aquaculture everywhere.

And this is where you, our valued member, industry supplier, scientist, neighbor, and friend of our industry, come in.

The Department of Ecology is holding a public hearing on October 14; the final comment period closes October 26. Once again, NWAA is encouraging everyone who cares about having a vital "Blue Economy" in the Pacific Northwest to submit comments during this final public comment period.

NWAA POSITION

We believe that the development of aquaculture in Washington state is vital to food security, public health, and a strong regional economy. We need all forms of aquaculture to thrive, particularly in a state that has the ideal natural resources, the technology, and the "people power" to make it happen.

As we learned from the previous comment period, well-organized environmental groups have the capacity to "flood" the comments with cookie-cutter comments, and baseless allegations against our member, Cooke Aquaculture Pacific.

We are therefore asking our members, friends, allied businesses, consultants, scientists, and others—as well as the research, retail, and culinary communities who support aquaculture—to make your voice heard during this permit modification review process. We need to inundate the public record with support. Will you help?

To submit your comment(s), please click on the following link: https://ecology.wa.gov/About-us/Get-to-know-us/News/2020/Sept-9-Draft-permits-Cooke-Aquaculture

Following are key facts for you to review and use as you see fit in support of CAP's request. These facts are tailored to address the new permitting requirements that ECY has drafted. We encourage you in your comments to submit comments in your own words. If you need help, please contact NWAA and we will be happy to help you with drafting, editing, or reviewing comments.

FEEDS, FEEDING PRACTICES, AND NUTRIENTS

- **C**ost of production is a major constraint of agriculture production. As with terrestrial agriculture, feed is a major cost factor, and industry—working with nutrition scientists and researchers—is taking the lead in making feeds and the feeding process more efficient.

- Throughout the world, finfish producers are focused on ways to reduce waste outputs and improve feed conversion ratios (FCRs), thereby reducing the overall cost of production. Nutritional strategies that result in significantly reduced waste outputs from commercial aquaculture operations (Bureau and Hua, 2010) have been adopted on an industry-wide basis. In fact, most global fish farmers work in a pre-competitive way to address such challenges as FCRs. Because of such industry-wide cooperation, aquaculture FCRs today have significantly improved, making it the most efficient form of protein production, compared with beef, pork, or poultry.

- Minimizing feed waste with maximum utilization is a continual effort of aquaculture feed scientists. Open cage systems, such as those utilized by CAP in its Puget Sound operations, have been the beneficiaries of improvements in feeds and in feeding technology. Recent technological advancements such as the use of underwater cameras, sensors, and modern feed production formulations and feeding methods have dramatically reduced impacts on the environment. In addition, ongoing research by both industry and academia into the physiological, behavioural, and biological requirements that control feed consumption and therefore growth rates, has substantially improved marine net pen operations.

- Progress in feed formulation, together with the introduction of modern feed production technology (e.g., semi-dry feed pellets, heated and pressurized pellet extrusion, improving raw materials, etc.), has resulted in the production of feed with more highly digestible (or useful) nutrient densities. Such advances have significantly reduced the amount of feed required to produce one unit of biomass (e.g. Cheng and Hardy, 2003).

- In the 1970s and early 1980s, feed conversion ratios (FCR, feed: weight gain) of 1.5 - 2.5 were common for market-size rainbow trout fed the commercial feeds available at that period in North America. Today, the use of more highly digestible nutrient-dense-extruded feeds [e.g. 40% digestible protein (DP), 25% fat, 419 MJ DE] allows FCR's of about 1 (ranging from 0.9 to 1.14) for growing these fish. This significant decrease in FCR was also accompanied by measurable, marked, and statistically significant decreases in total solid wastes, and solid and dissolved nitrogen and phosphorus wastes.

- Comparative reviews of nutritional requirements of, and feeding strategies for, Atlantic salmon and rainbow trout (Storebakken, T. 2002, Hardy, RW 2002) demonstrate the striking similarities in nutritional needs and digestion between the two species.

- Additional studies have reported upon the comparative abilities of rainbow trout and Atlantic salmon to digest and utilize feed nutrients. As an example, Krogdahl et al. (2004) found that these two species are quite similar with respect to growth (as measured by Thermal Growth Coefficient, TGC), retention of dietary protein, and retention of dietary energy when fed the same diets. They also reported improved increased digestibility of feed for trout, both in fresh- and salt-water.

- A study comparing the use of metabolizable energy in the diet between rainbow trout and Atlantic salmon similarly found no difference in either maintenance energy requirements or the amount of energy above maintenance requirements that was deposited as lipid in the carcass (Azevedo, et al. 2005).

- Nitrogen (N) and phosphorus (P) are the nutrients most likely to induce environmental impacts like eutrophication in the water column. N and P are not toxins, but biogenic elements which are necessary nutrients for primary production at the bottom of the marine food web. Puget Sound receives N and P from several major sources, including ocean upwelling, municipal wastewater, air emissions primarily from transportation sources, agricultural runoff, and forests. They (N and P) are potentially harmful in the marine environment *only if* their supply exceeds the assimilation capacity of the ecosystem.

- All ecosystems have an inherent capacity of persistence, and smaller changes in nutrient supply are mitigated through adaptive responses of the communities. The scientific understanding of these processes and impacts in both limnetic and benthic ecosystems from net pen aquaculture is well developed.

- Direct comparisons of modelled N and P outputs from scientific literature show extremely similar N and P for rainbow trout and salmon (Table 1). These studies are based on mass balance estimates of inputs, assimilation into fish, and outputs, and have been well-vetted in the scientific community.

Variable/ *Species*	Bureau, et al. 2003	Olsen, et al. 2008	Davies 2000
	RBT	*AS*	*AS*
FCR	1.14	1.16	1.17
Dissolved N	38.0	30.1	35.6
Solids N	9.3	14.3	12.6
Dissolved P	1.7	3.0	-
Solids P	5.8	5.2	-
Total N	47.5	44.4	48.2
Total P	7.5	8.0	-

Table 1. *Literature values of N and P waste outputs from cage farms rearing Atlantic salmon (AS) and rainbow trout (RBT). FCR = Feed conversion ratio (feed fed/total weight of fish produced). Nutrient values expressed in kg per tonne of fish produced.*

CONCLUSION: As the scientific literature clearly demonstrates, rainbow trout and Atlantic salmon are nearly identical, with no significant differences based upon the digestion of feed, growth patterns, and excretion of excess feed nutrients.

While the task of Ecology is limited to assessing whether or not the transition to rainbow trout from the currently permitted farming of Atlantic salmon will cause changes in the effluent from the cage systems, other concerns typically arise during Public Notice periods relating to cage aquaculture in Puget Sound.

NET PENS: STRUCTURAL INTEGRITY OF CAGE SYSTEMS

- The Cooke farms perform weekly surface inspections of the above-surface mooring points and walkway structures. Copies of those reports are collated into a running report that identifies each mooring point and the history of maintenance and repair. Anchor lines, mooring components, and below-surface components are inspected annually using a combination of divers and ROVs. Managers and maintenance personnel review the ROV videos and comments from the divers and identify when or if there are maintenance items that need to be scheduled.

- The Washington commercial salmon farms are required through the various state operating permits to have the marine net pen facilities inspected by a licensed marine engineer when the systems are fallow and prior to the entry of a new generation of fish. The engineers inspect the cage system components, mooring design, and maintenance records with respect to the risk of escape and develop a written report with outlining priority maintenance items.

A copy of this report is sent to the Washington State Department of Natural Resources ("DNR"), Washington State Department of Ecology, and Washington State Department of Fish and Wildlife ("DFW") for their review. A mooring analysis is performed using Doppler current monitoring data collected at each of the farm sites and marine net pen site computer modeling software that reviews the existing or required mooring components.

- The company has worked with DNR in developing a Net Hygiene Scoring system that assigns a numeric value from 1 to 10 (1 being little to no fouling growth) on the amount of fouling on the stock containment nets. This system communicates weekly the level of fouling growth on the nets to the agencies in a Net Hygiene Report. Staff divers inspect the stock nets weekly and assign a fouling score for each fish net at the farm. The Weekly Net Score Report collates the information from the farm sites into one report which is submitted weekly to DNR.

  The report keeps a running history of each farm site's average score which helps to identify whether net scores are increasing, decreasing, or staying relatively the same. Increasing scores would indicate the net washing frequency needs to be increased. DNR performs monthly net hygiene compliance checks using an underwater video of randomly selected fish pens to verify agreement with the Net Scoring Reports to their review of the condition of the net walls using the video system. This system has been very useful for the agencies to ensure net hygiene is being maintained and for the company in managing their net cleaning resources. Maintaining nets in as clean as possible condition helps to maintain the water exchange within each fish pen and minimizes the drag coefficient of the net surface area.

PUBLIC BENEFITS OF AQUACULTURE

In addition to these technical points, NWAA is drafting fact sheets that demonstrate the benefits of producing high quality protein for local markets and consumers; the benefits of producing a valuable source of nutritious protein at an affordable price; the potential that aquaculture poses in creating jobs and a robust economy; and the opportunity aquaculture provides in taking pressure off wild stocks.

Let's let our voices be heard and the public record be full of science-based, persuasive pro-PERMIT language!

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