

# Fish Health Section



## FHS NEWS

**Fish Health Section website:** <https://units.fisheries.org/fhs/>

**Fish Health Section Facebook Site:** <https://facebook.com/FishHealthSectionAFS>

## AFS Membership Campaign

In efforts to boost American Fisheries Society (AFS) membership, the AFS is currently holding an “AFS Member-get-a-member” campaign, the details of which can be found at <https://secure.fisheries.org/memgetmem>. Please consider recruiting a new AFS member (or three) who I’m sure would also be interested in joining the Fish Health Section. We have many important and active efforts underway within our section, so the more brain power, the better! Please also remember that the Virtual 150th AFS Meeting is set to commence in Sept. 2020, and registration is still open at the following link <https://afsannualmeeting.fisheries.org/>. Thanks for your continued activity as dedicated AFS-FHS members!

## 2020 FHS Business Meeting Minutes

The 2020 AFS-FHS business meeting was held June 25<sup>th</sup> online and attended by 65 people. Topics included: 2021 dues increase, Blue Book Ad-hoc report, Goede Index, committee reports, Blue Book Revision Project manager, 2021 meetings, FHS election results, and presentation of the S.F. Snieszko awards. Please see attached pdf for complete minutes or click here to watch the recorded meeting: <https://vimeo.com/442393153>.

## Policy/Position Development Committee Update

### How to request the FHS to develop a policy or position

The AFS-FHS Policy/Position Development Committee (PPDC) provides a mechanism for generating official policy/position statements by the AFS-FHS. Any member can bring a proposed issue, policy, or position statement forward to the PPDC for review. See the May 2020 FHS Newsletter for details (available on the FHS website). If you have an idea for a policy or position, please contact PPDC Chair Gary Marty ([Gary.Marty@gov.bc.ca](mailto:Gary.Marty@gov.bc.ca)) or any of the Committee members listed on the FHS web site.

## MEETINGS, WORKSHOPS AND COURSES

## **Joint Meeting of the Northeast Fish Health Committee and AFS Fish Health Section**

Burlington, VT

July 12<sup>th</sup> – 15<sup>th</sup>, 2021

See attached pdf for more information.

### **Fish Welfare Symposium**

The Fish Health Section will be co-organizing a symposium, entitled “[\*Fish Welfare\*](#) (ID number: 9479)”, with the Fish Culture Section at the American Fisheries Society 150th Anniversary Meeting online in September, 2020.

#### **Fish Welfare**

Fish welfare is an aspect of fish husbandry that is often overlooked. Fish can sense and react to noxious stimuli, often displaying similar aversive responses to the ones we observe in mammals, including stress. Chronic and acute stress can cause anorexia, weaken the immune system, and induce other physiological abnormalities. Stressed fish may display abnormal behaviors or show abnormal swimming patterns. In the aquaculture of food fishes, pre-slaughter stress can cause changes in the texture and quality of fish fillets. In the ornamental fish industry and for fishes cultured and/or transported for stocking, shipping stress may be an important cause of mortality. Thus, fish welfare is not only a matter of ethical debates but a relevant issue for anyone that works with fish from fishermen and fish growers to researchers using fish as animal models. This symposium will aim to explore a variety of aspects of fish welfare, including: how welfare can be assessed, the use of naturally derived compounds to reduce shipping and handling stress, and the effects of fish welfare in the overall health of fish.

#### **Organizers:**

Jose Reyes-Tomassini (<mailto:jreyes-tomassini@francis.edu>), Jeff Heindel, Michelle L. “Mick” Walsh and Benjamin R. LaFrentz

Time and date TBA.

All symposia for the conference can be viewed here:

<https://afs.confex.com/afs/2020/webprogrampreliminary/SYMP.html?fbclid=IwAR30YFqABXMRn5x1uKJoj8xQvmyyOylEqMgAbkGdv9-N2exS-u-vbpOiUQ>

Contact Ben LaFrentz ([benjamin.lafrentz@usda.gov](mailto:benjamin.lafrentz@usda.gov)) for more information.

### **JOBS/GRADUATE ASSISTANTSHIPS**

#### **Fish Pathologist**

**Northwest Indian Fisheries Commission**

Olympia, WA

Closes: September 11, 2020

Duties and Responsibilities: Provide fish health management services to Western Washington tribal fish enhancement programs by providing direct fish health monitoring and inspection services to tribal enhancement facilities.

See attached pdf for more information.

### **Postdoctoral position**

#### **The Hong Kong University of Science and Technology**

The Miller lab is seeking a highly motivated, organized and enthusiastic individual to help develop zebrafish as a model system to screen traditional Chinese medicines and novel synthetic compounds as possible therapeutic agents against SARS Cov-2 host-cell infection. Applicants with a PhD and strong background in fish virology are highly encouraged to apply. Salary and benefits are commensurate with relevant experience. The position is for 2 years and is available immediately. Please send your CV, and the name and address of three referees to: [almiller@ust.hk](mailto:almiller@ust.hk).

### **Veterinarian – Fish Health**

#### **Cermaq Canada, Ltd.**

Campbell River, B.C.

You will be a member of the Fish Health department in Campbell River, BC. Your team includes a Fish Health Director, a Fish Health Manager, and freshwater and saltwater Fish Health Technicians.

Your goal is to ensure that our operations remain in compliance in the areas of food safety and quality. This requires working with external bodies to ensure timely, accurate and effective information is provided to external bodies. You will be focused on ensuring that a quality product is consistently provided to our customers. Along with those duties you could be involved in all aspects of reporting, data analysis (fish health and production), and fish health management in order to supply information that will optimize fish health for maximum biological performance. You would have a team of fish health technicians to assist you with meeting these objectives when required.

As the Veterinarian, you will receive a competitive salary, a corporate bonus program, company paid benefits and a matching retirement fund.

See attached pdf for more information.

### **Aquatic Pathology Residency and PhD**

#### **University of Georgia, College of Veterinary Medicine, Department of Pathology**

Athens, GA

Closes: 9 October 2020

The Department of Pathology, College of Veterinary Medicine, The University of Georgia (<https://vet.uga.edu/education/academic-departments/pathology/>) in conjunction with the Georgia Aquarium has an opening for combined residency in anatomic pathology and PhD training with aquatic animal emphasis beginning July 1, 2021.

The incoming resident will join a team of 10 residents and a diverse faculty, including 1 certified fish pathologist and 20 ACVP diplomates, with expertise in domestic, aquatic, avian, exotic, wildlife, toxicologic and laboratory animal pathology. This intensive, comprehensive, 5-year training program is designed to meet the eligibility requirements for board certification by the American College of Veterinary Pathologists and meets most requirements for Fish Pathologist certification by the American Fisheries Society. Aquatic pathology experience is focused on the extensive collection of freshwater and marine fishes at the Georgia Aquarium and includes work conducted both at UGA and on-site in Atlanta. Exposure to invertebrates, amphibians, turtles, aquatic birds, and marine mammals occurs periodically. Residency training is augmented by necropsy experience in conjunction with the AAVLD-accredited Athens Veterinary Diagnostic Laboratory, surgical biopsy service to the teaching hospital and private veterinary practices, and a large Zoo, Exotic and Avian Pathology Service. Case-based learning is supplemented with several courses in histopathology, general pathology, and specialty areas (e.g., fish pathology). Additional fisheries related coursework is strongly encouraged.

See attached pdf for more information

### **Aquaculture Veterinarian**

#### **Department of Fisheries and Land Resources – Aquatic Animal Health Division**

St. John's, Newfoundland and Labrador, Canada

Closes: 31 March 2021

Reporting to the Chief Aquaculture Veterinarian, this is a highly professional position in aquatic animal health management within the Province. Work involves responsibility for veterinary service to fin (shell) fish producers and researchers in the province including the operation of diagnostic laboratories in St. John's, St. Alban's and Grand Falls-Windsor, the supervision of technical personnel, and participation in the aquatic animal health regulatory program. Key responsibilities include the provision of aquatic animal health service for cultured aquatic animals, response to emergency service needs, conducting active and passive surveillance programs, conducting biosecurity audits and providing evidence-based decision making leading to sound health policy. Preparation and delivery of public presentations will also be required.

See attached pdf for more information.

### **Zebrafish Related Job Announcements**

<https://wiki.zfin.org/display/jobs/Zebrafish-Related+Job+Announcements>

## RESOURCES/NEWS

### California lactococcosis outbreaks

Many of you have likely heard of the lactococcosis outbreaks (caused by *Lactococcus garviae*) that are unfolding in California. Attached, you will find some pertinent information on those outbreaks contained within a statement that was released by the California Department of Fish and Wildlife late last month. In addition, two clarifying points were released since that time and have been added at the end of the document.

**Aquatic Animal Drug Approval Partnership (AADAP) Updates are now available online:** [https://www.fws.gov/fisheries/AADAP/aadap\\_update.html](https://www.fws.gov/fisheries/AADAP/aadap_update.html)

### 2020 S. F. Snieszko Distinguished Service Awardees

Dr. Gael Kurath of the USGS Western Fisheries Research Center in Seattle WA is one of two 2020 S. F. Snieszko Distinguished Service Award recipients. Gael has spent a lifetime in fish disease research, published well over a hundred scientific papers, provided technical assistance to management agencies and colleagues, mentored a cadre of students, post-doctoral researchers and technical staff and served the FHS in several capacities including as President. As an Affiliate Professor at the University of Washington in the School of Aquatic and Fisheries Sciences and the Department of Global Health, Gael has supervised graduate students and post-doctoral researchers who have established significant careers in fish health themselves. She is considered by her peers as a world authority in her field of specialization, the molecular biology of fish viruses. In addition to Infectious hematopoietic necrosis virus, Gael has conducted research on other fish rhabdoviruses including Spring viremia of carp virus and Viral hemorrhagic septicemia virus, as well as fish and snake paramyxoviruses. More recently, her research on the evolution of virulence and host specificity of viruses in salmonid fish provides one of the very few animal model systems with which to investigate these important theoretical concepts in virology. Please join in congratulating her at [gkurath@usgs.gov](mailto:gkurath@usgs.gov).



Bruce Stewart was awarded the 2020 S.F. Snieszko Distinguished Service Award for creating and then dedicating his career to administering the first fish health program solely devoted to serving Native American Tribes. The Tribal Fish Health Program at the Northwest Indian Fisheries Commission, a natural resources management organization in western Washington, provides fish health services to the twenty member tribes. Bruce played an integral role in developing and implementing The Salmonid Disease Control Policy of the Fisheries Co-Managers of Washington State, which brings sound fish health principles together with the practical demands of real-world applications. He also served as an active participant in the Pacific Northwest Fish Health Protection Committee, as well as serving on Fish Health Section committees, hosting regional and national conferences, and mentoring those interested in fish health. Bruce is widely known among his peers as an important scientific collaborator on a broad range of fish health projects. His work with, and in support of fish health research projects (including several with Gael Kurath!) led to advances in our understanding of diseases that impact salmonids in the Pacific Northwest. Bruce is now enjoying his retirement- if you would like to get in touch with him, his email is [bstewartc@gmail.com](mailto:bstewartc@gmail.com).



### **AFS Position on Aquaculture**

**Published July 21, 2020**

Link: <https://fisheries.org/2020/07/american-fisheries-society-position-on-aquaculture/>

The American Fisheries Society (AFS) supports sustainable growth of aquaculture. The demand for fish is expected to grow significantly in the next decade, but it is unlikely that capture fisheries can sustainably accommodate increased harvest pressure to meet this demand. Domestic freshwater and marine aquaculture present existing and emerging opportunities to sustainably address America's ongoing dependence on imported seafood, while relieving local pressures on wild stocks and impacts on aquatic ecosystems and waterfront communities. AFS calls for a clear, predictable, regulatory framework that will enable industry growth in a conscientious, environmentally sustainable manner. Further, we call for continued, consistent investments in research to understand effects of aquaculture development on fisheries and aquatic resources, and innovation to minimize negative environmental and social impacts of fish cultivation.

U.S. policymakers must address the future of our seafood supply and food insecurity. Seafood demand in the U.S. has grown steadily, driven by increases in both population and per capita seafood consumption [1]. Yet, capture fisheries landings have not increased appreciably for 30 years. The anticipated impacts on wild fish populations

from climate change make it less likely that wild stocks will be able to withstand additional harvest pressure.

Worldwide, fish farming has overtaken wild harvest of fish as the leading source of seafood, producing nearly 80 million metric tons in 2016[2]. Today, the majority of seafood consumed in the U.S. is imported and more than half is farm-raised. Enabling expansion of the marine aquaculture industry in the USA would increase domestic seafood supplies in accordance with strong environmental, food safety, and labor standards and protections.

While finfish and shellfish culture has supported traditional communities and working waterfronts in state waters for more than a century in the U.S., offshore finfish aquaculture has not kept pace. By establishing a clear and predictable legal and regulatory structure for marine aquaculture in the U.S., we can reduce the overreliance on seafood imports and improve seafood security with wholesome, domestically farmed seafood that minimizes the environmental and social footprint of the industry on our marine habitat and resources. Implementation of best practices and improvements has already reduced environmental impacts substantially (e.g., reduced use of fish meal and oil in feeds, siting tools to minimize user conflicts and effects of discharge, improved biosecurity practices and strict veterinary oversight of therapeutant use), and ongoing innovation will continue to reduce the environmental footprint of fish farming. Furthermore, existing law and regulatory frameworks in the U.S. ensure aquaculture operations are held to high standards with respect to environmental impacts. Healthy wild fisheries and responsible marine aquaculture can and must coexist if we are to feed ourselves and still fulfill our commitment to wild fish and wild places.

[1] FAOSTAT. 2020. Food Supply – Livestock and Fish Primary Equivalent. Database. Available: <http://www.fao.org/faostat/en/#data/CL> (4 May 2020).

[2] FAO (Food and Agriculture Organization). 2018. State of World Fisheries and Aquaculture. Food and Agriculture Organization of the United Nations, Rome. Available: <http://www.fao.org/state-of-fisheries-aquaculture> (4 May 2020).



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**Agenda item:** Committee Reports – Technical Standards Committee      **Presenter:** Mohamed Faisal

**Discussion:**

Several chapters in the Diagnostic Section of the Blue Book have been updated (and uploaded to the website) and several more are currently going through revisions. However, this is not enough, as many other chapters have not been updated in over 20 years. There is still a lot of work to bring the Blue Book up-to-date with the methods that are currently available.

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**Agenda item:** Committee Reports – Professional Standards Committee      **Presenter:** Mark Lawrence

**Discussion:**

The Committee has started using Google Docs to streamline their application review process and has been working on updating the Aquatic Animal Health Inspector (AAHI) and Certified Fish Pathologist (CFP) exam content. The AAHI exam review has been completed and updated and the CFP exam review is still ongoing but is expected to be completed in the next year. The committee reviewed 15 AAHI applications this past year (4 of which were re-certifications and 11 were new applications) and 4 re-certifications for CFPs. The list of current AAHIs and CFPs on the website has been brought up-to-date (currently 34 AAHIs and 17 CFPs) and will be updated every 6 months.

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**Agenda item:** Committee Reports – Policy/Position Development Committee      **Presenter:** Tom Loch

**Discussion:**

The purpose of this Committee is to assist members with raising awareness on important issues, potentially leading to official positions on behalf of the Section and prompting action on official policies. If there is an issue that any member thinks is worthy or important, please reach out to any PPDC member. Most recently, the PPDC reached out to the World Veterinary Association (WVA) in regard to a factsheet on animal welfare that they had produced that contained some erroneous facts and anti-aquaculture statements. The WVA has responded that they are taking the PPDC's suggestions into consideration and requested that the Section provide them with new photos to include.

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**Agenda item:** Committee Reports – Handbook Revision and Oversight Committee      **Presenter:** Mohamed Faisal/Gavin Glenney

**Discussion:**

The Committee worked towards including new molecular assays for *Renibacterium salmoninarum*, Viral Hemorrhagic Septicemia Virus (VHSV), and *Myxobolus cerebralis* into the Blue Book. As *M. cerebralis* still needs to go through extensive ring testing, it was unable to be included in the Blue Book revisions this year. However, real time PCR assays were added to the Blue Book for *R. salmoninarum* and VHSV.

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**Agenda item:** Committee Reports – International Meeting Oversight Committee      **Presenter:** Dave Groman

**Discussion:**

The location for the 2022 ISAAC is not finalized yet; there has been one proposal to host the meeting at a university in Santiago, Chile. The proposal is being reviewed but as the Committee is waiting for a budget to be submitted, no official decision has been made yet.

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**Agenda item:** Committee Reports – Recruitment and Student Involvement Committee      **Presenter:** Amy Long

**Discussion:**

The Committee recently sent out a survey to members and non-members to gauge why people are members, what they hope to get out of membership, and what can be done to encourage others to join the Section. The Committee has also

been adding profiles of students and early career members on the website (<http://afs-fhs-students.blogspot.com/>) and are always recruiting others to be profiled. Due to the widespread cancelation of workshops and conferences this year, one of the committee members (Nick Phelps) came up with the idea for a showcase for students and post-docs to share their research via the AFS FHS Summer Seminar Series (<https://sites.google.com/umn.edu/fishhealthseminar>). Average attendance to these virtual presentations has been 40-50 people and has been a success.

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**Agenda item:** Committee Reports – Fish Health Laboratory QA/QC Committee      **Presenter:** Chris Wilson

**Discussion:**

The Committee has been very active with 12 Tier 1 laboratories and are in the process of reviewing the first application for Tier 2 status. There may be a slow down on labs attempting to achieve Tier 2 status, as required USDA in-person training may be canceled due to the pandemic. The Committee will continue to work with the USDA and NAHLN on Tier 3 status.

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**Agenda item:** New Business – Blue Book Revision Project Manager      **Presenter:** Ben LaFrentz

**Discussion:**

As mentioned previously, a request for the Inspection Section of the Blue Book to be evaluated was thoroughly reviewed and a report of the findings was produced, serving as a guiding document for revising the Blue Book. In order to achieve this, the Section and Parent Society sought funds to facilitate making the necessary updates and changes to the Blue Book. These funds were secured and support hiring a Project Manager (PM) to oversee the process, using the recommendations of the ad hoc committee. The PM will provide administrative support and assistance with telecommunications; a steering committee and work groups will be created to make the actual revisions. This project was set to get started in 2020, but due to the pandemic, it has been delayed until 2021.

Discussion by several members stressed the importance of this project, that it is no small undertaking, and that it will likely not be completed in one year. It was acknowledged that the ad hoc committee did recognize that the Blue Book is currently very salmonid-centric and one of the goals of these revisions is to bring pathogens of other species into the Blue Book. It is important that representation on the steering committee and work groups include representatives from all relevant organizations and agencies (Federal, state, tribal, private, research, etc.). Discussion also centered on the issue of the Inspection Section being used as a regulatory document and the potential legal ramifications; the Parent Society is soliciting legal advice to ensure that the Section is protected against any possible future litigation. Additionally, the role of the Inspection Section in guiding regulations is something that needs to be reviewed and re-considered in this project.

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**Agenda item:** New Business – 2020 AFS Annual Meeting      **Presenter:** Ben LaFrentz

**Discussion:**

The in-person portion of the 2020 AFS Annual Meeting in Ohio has been canceled and will be entirely virtual. There will also be a workshop on Fish Welfare co-sponsored with the Fish Culture Section at the virtual meeting. There may be a specific Fish Health session at the virtual conference if enough relevant presentations are submitted.

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**Agenda item:** New Business – 2021 Joint NEFHC/FHS Annual Meeting      **Presenter:** Ben LaFrentz

**Discussion:**

The 2021 Section Annual Meeting will be held jointly with the Northeast Fish Health Committee (NEFHC) Meeting July 12-15, 2021 in Burlington, Vermont. It will be held at the same venue that was planned for 2020, with a tentative agenda described below and more details to follow in future months.

July 12: NEFHC Meeting

July 13: Continuing Education course (Molecular tools) and opening reception

July 14-15: FHS Meeting

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**Agenda item:** New Business – 2021 WFDW **Presenter:** Sascha Hallett

**Discussion:**

The 2021 WFDW will be held in Hood River, Oregon from June 14-17. It is being organized by the Oregon Department of Fish and Wildlife (Aimee Reed and Sarah Bjork) and Oregon State University (Jerri Bartholomew and Sascha Hallett). The Continuing Education course will be related to applied nutrition for disease management.

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**Agenda item:** New Business – Election Results **Presenter:** Derek Gibbs

**Discussion:**

The 2020 election results are as follows:

Position	Elected member
Vice President	Anita Kelly
Technical Standards Committee	Stephen Reichley
Professional Standards Committee	Joe Marcino
Policy/Position Development Committee	Jesse Trushenski
Nominating and Balloting Committee	Nicholas Phelps

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**Agenda item:** Awards – Achievement Awards for Committee Chairs **Presenter:** Ben LaFrentz

**Discussion:**

At the beginning of the year, each committee chair was asked to come up with 3-5 goals to accomplish throughout the year and the following chairs were recognized for their achievements: **Mohamed Faisal** (Technical Standards Committee Chair and Handbook Revision and Oversight Committee Co-Chair), **Derek Gibbs** (Nominating and Balloting Committee Chair), **Tom Loch** (Policy/Position Development Committee Chair), **Gavin Glenney** (Handbook Revision and Oversight Committee Co-Chair), **Stacy Strickland** (Section Communications Committee Chair), and **Chris Wilson** (Fish Health Laboratory QA/QC Committee Chair).

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**Agenda item:** Awards – SDS Award **Presenter:** Luke Iwanowicz

**Discussion:**

The S.F. Snieszko Distinguished Service Award is the most prestigious award in the Section and recognizes outstanding accomplishments in the field of aquatic animal health. This year, the award was presented to two deserving awardees: Bruce Stewart and Dr. Gael Kurath.

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**Agenda item:** Passing of the Presidency **Presenter:** Tom Loch

**Discussion:**

The Past-President Award was presented to Ben LaFrentz, who went above and beyond and did a tremendous job as president, shepherding the Section through unprecedented times (the first virtual meeting!).

## **FAQ for *Lactococcus garvieae* outbreak in Southern California fish hatcheries July 20, 2020**

Three California Department of Fish and Wildlife (CDFW) hatcheries in Southern California and the eastern Sierra are currently fighting a bacterial outbreak *Lactococcus garvieae* among their fish stocks. The disease was previously unknown in California, and CDFW staff have been trying multiple treatments and strategies to try to resolve the outbreak over the last three months. Efforts have been unsuccessful. Consequently and as a last resort, CDFW pathologists have recommended that the fish be euthanized and the facilities disinfected before repopulating the hatcheries with *L. garvieae*-free fish.

### **What is this bacteria, and how does it harm fish?**

*Lactococcus garvieae* is similar to streptococcus. The bacterium has caused disease in freshwater and saltwater aquaculture facilities around the world, although this is the first time it has been detected in California. *L. garvieae* can cause a blood-borne disease with symptoms including anorexia, bulging eyes with hemorrhaging around the edges, lethargic or erratic swimming, darkening of the skin, swollen abdomens and increased mortality. Infected fish may also show no signs of infection depending on several factors, including water temperature and stress.

### **When was the bacterium discovered, and which CDFW hatcheries are affected?**

The *L. garvieae* bacteria is known to be present in the US but to date has only been identified in a handful of aquaculture facilities. It had not been found in California, either in aquaculture facilities or in the wild, prior to its discovery at the Mojave River Hatchery in late April 2020. That hatchery was immediately placed on quarantine. CDFW pathologists and hatchery staff have been battling the outbreak from late April to the present. CDFW pathologists identified *L. garvieae* in the Fish Springs and Black Rock Fish hatcheries on June 25. Fish Springs and Black Rock Hatcheries were immediately quarantined. Due to its proximity to the positive Eastern Sierra hatcheries, Hot Creek Hatchery was also quarantined. Extensive testing at Hot Creek Hatchery revealed it to be free of the bacteria and the quarantine was lifted on June 25.

### **Do we know the source of the original outbreak? How might it have come to California?**

Pathologists do not know the source of the original outbreak at the three hatcheries, but DNA analysis of the strain shows high similarity to a strain found in the Columbia River Basin. This bacterium is usually spread by movement of fish or eggs, but we do not believe that is the case for the three CDFW hatcheries. Our current belief is that it was carried into the hatchery by birds that picked it up from an environmental source.

### **How quickly, and through what means, is it known to spread?**

Rainbow trout can be infected with the bacteria, but not be diseased by it, at water temperatures up to 59 degrees F. At temperatures above 59 degrees F, the bacteria can become pathogenic for trout. The bacteria can be spread between hatcheries or other water sources through movement of infected fish, fish eggs or even feed produced with fish meal contaminated with the bacteria. Contaminated equipment (nets, buckets, boots, etc.) may also contribute to its spread. The bacteria has also been identified in the feces of birds. Once it has spread into a hatchery and a fish becomes infected, it easily spreads from fish to fish.

### **How many fish are at the hatcheries?**

There are approximately 3.2 million rainbow trout, brown trout and Lahontan cutthroat trout at the three hatcheries, ranging in size from fry and fingerlings to catchable fish.

### **Are bacterial outbreaks common among fish?**

Disease outbreaks of different types are not uncommon in fish hatcheries. Most fish pathogens are present in the lakes and rivers of the state and come into hatcheries with the water. They only cause infection and disease when conditions such as elevated water temperatures or crowding stress tilt in their favor. Hatchery staff are trained to recognize sick fish and consult with CDFW veterinarians to treat illnesses as needed. What's unusual about this particular outbreak is that this pathogen is new in California. Further complicating the treatment of the fish is that the bacteria is resistant to most of the few antibiotics approved by the US Food and Drug Administration (FDA) for treating fish in aquaculture.

### **What treatments were tried prior to making the decision to euthanize the fish?**

CDFW fish pathologists and veterinarians placed fish on a specialized immune system boosting diet and administered multiple rounds of antibiotics. Hatchery staff also attempted to spread fish out as much as possible to reduce stress. Unfortunately, *L. garveae* is resistant to most antibiotics approved by the FDA for use in food fish. CDFW veterinarians treated the fish with the one FDA-approved antibiotic to which the bacteria showed any susceptibility – and that susceptibility was only moderate. In addition, this bacterium can live in a biofilm on raceway walls and other surfaces. Even if the fish were able to rid itself of the bacteria, the chances of reinfection from contaminated surfaces in the hatchery would be significant.

### **Will the fish be euthanized humanely?**

The decision to euthanize animals is not a decision we take lightly. CDFW has strict policies governing euthanization of animals in our care. CDFW will follow recommendations put forward by the American Veterinary Medical Association (AVMA) to ensure the procedure is performed in the most humane way possible.

### **What will be done with the euthanized fish?**

Unfortunately, the bacterial contamination makes these fish unsuitable for use as animal feed, fertilizer, food banks or any other consumptive use. CDFW is still working on a disposal plan, which will follow published CalEPA guidance on emergency disposal of animal carcasses.

### **How will the facilities be disinfected?**

CDFW is developing a comprehensive disinfectant plan. We have partnered with specialists at UC Davis to run experimental treatment scenarios to determine the most effective disinfectant options. We will also pull from knowledge gained at fish farms around the world that have experience with this bacterium, in order to ensure we use the most effective disinfection procedures possible.

### **What is CDFW doing to monitor for outbreaks in other hatcheries?**

CDFW has a comprehensive fish health program. Hatchery staff observe their fish multiple times daily for signs that they are not well. Signs of illness include loss of appetite, darkening of their skin, change in behavior or elevated mortalities. When these signs are observed, the hatchery managers will call the CDFW Fish Health Laboratory to have a fish pathologist or veterinarian come to the hatchery and perform a diagnostic examination to determine the cause of the illness. The Fish Health Lab pathologists also perform routine examinations to confirm the well-being of fish at all CDFW fish hatcheries, even when no illness is apparent. This is how the infections at Black Rock Hatchery and Fish Springs Hatchery were identified (the bacteria were cultured from fish showing no obvious signs of disease).

**What trout hatcheries do not have the bacteria?**

There are currently seven other trout production hatcheries and two planting bases still in operation. These facilities mainly serve waters in the central and northern portions of the state from the westside of the Sierra Nevada mountains to the Pacific coast. One of the seven hatcheries not currently under quarantine, Fillmore Hatchery, does serve some Southern California waters. However, Fillmore is just coming back online after an extended closure due to infrastructure issues. Fillmore is expected to have a limited number of fish to stockable size for the fall planting season in Southern California.

**Where have scheduled fish plants been canceled, due to this outbreak?**

Mojave River, Fish Springs and Black Rock Hatcheries are responsible for stocking the majority of the waterways in the eastern Sierra and Southern California. The counties affected include:

- Los Angeles
- San Bernardino
- Riverside
- San Diego
- Orange
- Ventura
- Santa Barbara Inyo
- Mono

**What waters are being stocked in those counties?**

Hot Creek Hatchery is conducting their normal plants to waters they serve in Inyo and Mono counties. Those waters include:

- Owens River Sections I, II and III
- Crowley Lake
- Pleasant Valley Reservoir
- Bishop Creek Lower
- Lone Pine Creek
- Diaz Lake

**Can CDFW make up for the canceled plants with fish from non-infected hatcheries?**

Currently three of our largest trout production hatcheries in the state are shut down, and two others are coming back online after significant infrastructure problems and not yet at full production. In addition, a catchable size fish takes around two years to get to size. There is no way for the remaining trout hatcheries to make up that level of fish production. CDFW is evaluating the possibility of re-allocating fish destined to be stocked in northern California waters to a small group of high use, easily accessible Eastern Sierra and Southern California waters, but there are still significant logistical details to be worked out including safety of staff and travel under current COVID-19 restrictions.

**When did CDFW stop stocking fish from the affected hatcheries?**

The last plants from the Mojave River Hatchery were on May 1. Stocking operations at Fish Springs Hatchery and Black Rock Hatchery were halted when those facilities were placed under quarantine on June 19.

**Are there concerns that infected hatchery fish could have been planted prior to detection of the bacteria?**

While CDFW does not plant diseased fish, it appears possible some locations were planted with fish carrying the bacteria but not showing any outward signs or symptoms of bacteria from these hatcheries prior to the confirmation of *L. garvieae*. This pathogen is known to occur in the environment in the Pacific Northwest, including in the Columbia River.

**Can humans get sick from this bacteria? Should people take extra precaution if eating fish they catch?**

There is limited evidence *L. garvieae* bacteria has been passed to humans, but fish-to-human transmission is extremely rare. As always, anglers should follow USDA recommendations on cooking fish to an internal temperature of 145 degrees F.

**What's the long-term projection for future year stocking?**

Depending on water temperatures and fish density, rainbow trout can take anywhere from 10 months to two years to get to a catchable size of a half-pound. We typically have rainbow trout eggs available in the state December through March. At the depopulated hatcheries, we won't likely have catchable size fish ready from eggs they hatch until December 2021 or January 2022 at Mojave and the spring of 2022 at Fish Springs and Black Rock hatcheries. There is some potential to jumpstart those facilities by transferring small fish in from other hatcheries, but we will need to be sure the hatcheries test clean prior to doing any fish transfers.

###

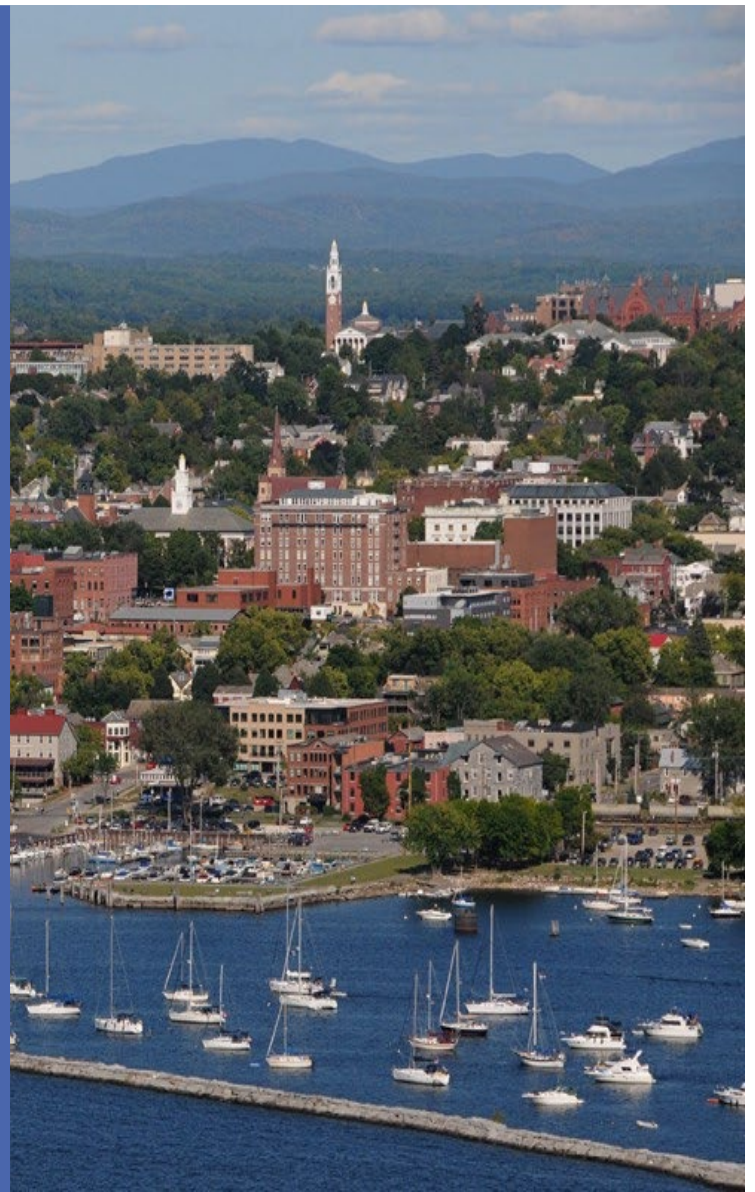
**Additional Information since original release is as follows:**

- Subsequent molecular analysis has shown that the California Lactococcus isolates are different from the Washington isolates.
- Rainbow Trout may experience some elevated losses to the infection when the water temperatures are below 60F. As the temperature increases from 60-65 and above, losses increase correspondingly.

JOINT MEETING OF THE  
NORTHEAST FISH HEALTH  
COMMITTEE AND AFS FISH  
HEALTH SECTION

APPLYING RESEARCH:  
BRIDGING THE GAP  
BETWEEN AQUATIC  
ANIMAL HEALTH  
RESEARCH AND  
INSPECTIONS

JULY 12<sup>TH</sup> – 15<sup>TH</sup>, 2021  
HILTON LAKE CHAMPLAIN  
BURLINGTON, VERMONT



## Tentative Schedule at a Glance:

### July 12<sup>th</sup> & 13<sup>th</sup>

- NEFHC Meeting
- NEFHC Fish Culture Chiefs Meeting
- FHS EXCOM Meeting

### July 13<sup>th</sup>

- FHS Continuing Education Course (TBD)
- Icebreaker Opening Social

### July 14<sup>th</sup> – 15<sup>th</sup>

- Special Sessions
  - “Fish Health Research/Topics in the Northeast US”
  - “Current Status of Fish Health Regulations and Testing Criteria for Aquatic Animal Movements in the Northeastern US & Canada”
- General Sessions and Case Study Reports
- Poster Session
- FHS Business Meeting
- Banquet



# Northwest Indian Fisheries Commission

6730 Martin Way E., Olympia, Washington 98516-5540  
Phone (360) 438-1180

[www.nwifc.org](http://www.nwifc.org)

FAX # 753-8659

## VACANCY ANNOUNCEMENT

**Position:** Fish Pathologist

**Salary:** \$55,754-\$73,420 DOQ

**Location:** Northwest Indian Fisheries Commission  
Olympia, Washington

**Closing Date:** Sept. 11, 2020

**Duties and Responsibilities:** Provide fish health management services to Western Washington tribal fish enhancement programs by providing direct fish health monitoring and inspection services to tribal enhancement facilities.

**Qualifications:** A Master of Science (MS) with special emphasis in microbiology or fish health and one year of pertinent work experience. Must obtain and maintain either AFS FHS certification as a Fish Health Inspector or Fish Pathologist within the first 12 months of employment.

Pertinent work experience and knowledge required for this position includes: Pacific salmon rearing and release strategies; presumptive diagnosis of fish diseases and administration of treatments; epizootiology of salmonid diseases; culture and identification methods for bacterial and viral fish pathogens; PC software programs for word processing and spreadsheets; and molecular assays and their use in surveillance efforts for aquatic organisms.

**Application:** Send resume and cover letter by Sept. 11, 2020 to: Wendy Bowman, HR Northwest Indian Fisheries Commission, 6730 Martin Way East Olympia, WA 98516-5540 or email to: [wbowman@nwifc.org](mailto:wbowman@nwifc.org).

The Northwest Indian Fisheries Commission operates under PL 93-638 contract; **Indian Preference is an employment policy.** Must be authorized to work in the U.S. The NWIFC will not sponsor applicants for work visas.

# Career Opportunity – Job Posting

## Opportunity for Appointment - Public

### Aquaculture Veterinarian



## Competition Details

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Referral Number	FLR.19.20.R0865
Employment Type	1 permanent position; 1 temporary position
End Date	March 31, 2021
Division	Aquatic Animal Health Division
Department	Department of Fisheries and Land Resources
Locations	St. John's
Closing Date	open until filled
Salary (scale)	\$45.01 - \$53.19 per hour (CG-46)
Allowances	<a href="#">Click here to enter allowances.</a>

## Position Details

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### Context

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<https://www.fishaq.gov.nl.ca/aquaculture/index.html> [Help!](#)

### Duties

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Reporting to the Chief Aquaculture Veterinarian, this is a highly professional position in aquatic animal health management within the Province. Work involves responsibility for veterinary service to fin (shell) fish producers and researchers in the province including the operation of diagnostic laboratories in St. John's, St. Alban's and Grand Falls-Windsor, the supervision of technical personnel, and participation in the aquatic animal health regulatory program. Key responsibilities include the provision of aquatic animal health service for cultured aquatic animals, response to emergency service needs, conducting active and passive surveillance programs, conducting biosecurity audits and providing evidence-based decision making leading to sound health policy. Preparation and delivery of public presentations will also be required. [Help!](#)

## Merit Criteria

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### Screening Criteria *Use numbered lists only.* [Help!](#)

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1. Doctor of Veterinary Medicine
2. Experience with aquatic veterinary medicine
3. Experience conducting biosecurity audits
4. Supervisory experience (asset)

### Assessment Criteria *Use numbered lists only.* [Help!](#)

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1. Knowledge of aquatic veterinary medicine
2. Knowledge of conducting biosecurity audits
3. Knowledge of disease outbreaks

Human Resources Secretariat – Strategic Staffing Division

Form Revised: December 16, 2019

4. Knowledge of aquatic laboratory practices
5. Knowledge of the aquaculture industry
6. Ability to supervise others
7. Ability to make decisions
8. Ability to manage time and tasks
9. Ability to communicate effectively (verbal)
10. Professionalism

## Conditions of Employment

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### Conditions of Offer *Use numbered lists only.* [Help!](#)

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1. Demonstration of Doctor of Veterinary Medicine degree
2. National Veterinary Board Examination Certificate of Completion
3. Eligible for full licensure with the Newfoundland and Labrador College of Veterinarians
4. Proof of Class 5 Drivers License

### Conditions of Acceptance *Use numbered lists only.* [Help!](#)

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1. Acknowledges requirement for travel by vehicle, vessel, snowmobile and UTV
2. Acknowledges requirement for continuous education and training
3. Acknowledges requirement for performing work in variable weather conditions (on-land and marine)
4. Willing to accept emergency and stand-by on call availability
5. Willing to accept overtime

### Applicant Information *Use numbered bullets only.*

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For more information about this opportunity please contact: Dr. Daryl Whelan at (709) 729-0387.

1.
  - The Government of Newfoundland and Labrador values diversity in the work place and is an equal opportunity employer.
  - Disability related accommodations and alternate formats are available upon request at any stage of the recruitment process by contacting [recruitment@gov.nl.ca](mailto:recruitment@gov.nl.ca), 709-729-0130 or toll free at 1-888-729-7690.
  - Preference will be given to applicants who are legally entitled to work in Canada.
  - Applications must be received on or before the closing date stated for this job posting.
  - It is the responsibility of the applicant to submit an application that demonstrates the required merit criteria.
  - Applications that do not clearly demonstrate the required criteria will be screened-out.
  - All applications must contain accurate contact information, including current mailing address, email address and phone number.
  - All information submitted as part of this application must be factual, complete and current to date of submission.
  - This competition may be used to fill future similar vacancies with the Government of Newfoundland and Labrador.

## **Combined Anatomic Pathology Residency and PhD with an Aquatic Animal Emphasis – University of Georgia**

The Department of Pathology, College of Veterinary Medicine, The University of Georgia (<https://vet.uga.edu/education/academic-departments/pathology/>) in conjunction with the Georgia Aquarium has an opening for combined residency in anatomic pathology and PhD training with aquatic animal emphasis beginning July 1, 2021.

The incoming resident will join a team of 10 residents and a diverse faculty, including 1 certified fish pathologist and 20 ACVP diplomates, with expertise in domestic, aquatic, avian, exotic, wildlife, toxicologic and laboratory animal pathology. This intensive, comprehensive, 5-year training program is designed to meet the eligibility requirements for board certification by the American College of Veterinary Pathologists and meets most requirements for Fish Pathologist certification by the American Fisheries Society. Aquatic pathology experience is focused on the extensive collection of freshwater and marine fishes at the Georgia Aquarium and includes work conducted both at UGA and on-site in Atlanta. Exposure to invertebrates, amphibians, turtles, aquatic birds, and marine mammals occurs periodically. Residency training is augmented by necropsy experience in conjunction with the AAVLD-accredited Athens Veterinary Diagnostic Laboratory, surgical biopsy service to the teaching hospital and private veterinary practices, and a large Zoo, Exotic and Avian Pathology Service. Case-based learning is supplemented with several courses in histopathology, general pathology, and specialty areas (e.g., fish pathology). Additional fisheries related coursework is strongly encouraged.

Graduate training utilizes modern scientific methodology and encourages independent thought, with an emphasis on hypothesis-driven applied or basic research in an area of aquatic animal disease, as well as the development of oral and written communication skills. Teaching in the professional curriculum, participation in seminars, presentations at national meetings, and manuscript publication are also expected of the resident. The starting salary is \$32,631 per year plus tuition support and travel support to regional and national meetings, including training courses.

Applicants must possess a DVM or equivalent degree, must be United States citizens or be eligible for lawful admission to the United States, and must provide evidence of academic strength and interest in anatomic and aquatic animal pathology and research. Top candidates may be asked to participate in phone and/or in-person interviews, although any interested applicant is welcome to visit. Applications submitted by October 9, 2020 are assured full consideration.

For further information regarding the aquatic portion of the training, contact Dr. Al Camus, Department of Pathology, College of Veterinary Medicine, The University of Georgia, Athens, GA 30602-7388, phone: (706) 542-5848, FAX: (706) 542-

5828, or E-mail: [camus@uga.edu](mailto:camus@uga.edu). For further information regarding the residency program, contact Dr. Elizabeth Howerth (706-542-5833, [howerth@uga.edu](mailto:howerth@uga.edu)) or Dr. James Stanton (706-542-2853, [jbs@uga.edu](mailto:jbs@uga.edu)).

The following residency application materials must be sent electronically to Ms. Amanda Wages at [awages@uga.edu](mailto:awages@uga.edu): curriculum vitae, statement of professional goals, and unofficial veterinary school transcripts. Each file should be labeled with the applicant's last name and file contents (e.g., Stanton\_CV.pdf). Three letters of reference are also required, but they may be emailed separately.

**For the application to be considered, concurrent application to the UGA Graduate school (including official veterinary school transcripts) for the PhD in Comparative Biomedical Sciences program must also be submitted through the Graduate school website**

**(<https://grad.uga.edu/index.php/prospective-students/domestic-application-information/requirements/>).**

The University of Georgia is located in Athens, a vibrant community of 100,000 located in the wooded Piedmont hills of northeast Georgia. Offering the amenities of a cosmopolitan city, the surrounding area also offers a wide variety of lifestyle choices. Athens is located 1½ hours from Atlanta, two hours from the Appalachian Trail, and four hours from the Atlantic coast. The University of Georgia is an Equal Opportunity/Affirmative Action employer. All qualified applicants will receive consideration without regard to race, color, religion, sex, national origin, disability, gender identity, sexual orientation or protected veteran status.

## **Veterinarian- Fish Health**

At Cermaq Canada Ltd. we strive to be the customer's choice by producing quality salmon in our sustainable aquaculture operations on Vancouver Island. We are ranked #2 globally for sustainability. To prove this, we maintain several international certification standards along with an award winning safety culture.

You will be a member of the Fish Health department in Campbell River, BC. Your team includes a Fish Health Director, a Fish Health Manager, and freshwater and saltwater Fish Health Technicians.

Your goal is to ensure that our operations remain in compliance in the areas of food safety and quality. This requires working with external bodies to ensure timely, accurate and effective information is provided to external bodies. You will be focused on ensuring that a quality product is consistently provided to our customers. Along with those duties you could be involved in all aspects of reporting, data analysis (fish health and production), and fish health management in order to supply information that will optimize fish health for maximum biological performance. You would have a team of fish health technicians to assist you with meeting these objectives when required.

As the Veterinarian, you will receive a competitive salary, a corporate bonus program, company paid benefits and a matching retirement fund.

### **Primary Accountabilities**

- Assist the other veterinarian(s) in managing therapeutants and medicated feed, as well as coordinate imports of drugs and vaccines.
- Participate in the Cermaq Canada's Food Safety & Quality Management Systems to ensure continuous improvement and product safety that ensures we deliver the final product to the highest standards to our customers.
- Conduct fish health and production data analysis then report out the information to the external bodies and internally to the management team and other departments to ensure effective decision making that minimizes risk and expenditures.
- Review fish health protocols to ensure they are up to date and being complied with so that every effort is made to produce optimal stock conditions.
- Participate in internal fish health projects as necessary to continually improve the health and welfare of the fish.
- Participate and provide support to industry fish health and research initiatives that speaks to the sustainability of the operations.
- Participate in regular Fish Health Meetings by contributing expertise and suggesting improvement.

*Frequent regional and provincial travel is required. Some international travel may occur.*

**Cermaq Canada Ltd.**

203-919 Island Highway, Campbell  
River, BC  
V9W 2C2 Canada

+1 250 286-0022

[www.cermaq.ca](http://www.cermaq.ca)

## Your Education and Experience:

- Doctor of Veterinary Medicine (DVM) – licensed in BC or qualified to become licensed in BC
- Experience with salmon production preferred, consideration will be given to those with herd production experience with other species
- Experience with advanced statistical tools and analyzing data is an asset
- Experience coordinating projects, research activities and leading teams is also an asset
- Strong understanding of animal health principles

