

Monday September 3rd – Tilly / Tupper
American Association of Fish Veterinarians (AAFV)
Moderator – Thomas Waltzek (University of Florida)

9:30 AM	AAFV	<u>Mitchell</u> - The early years of salmon farming medicine in the US: Practice and Politics
9:45 AM		
10:00 AM		<u>Milligan</u> - Changing practices and environment affecting aquaculture: overview of the current status and challenges facing a BC Atlantic salmon farm
10:15 AM		<u>Whittaker</u> - The Risk to Farmed Atlantic Salmon of Wild Piscine Orthoreovirus (PRV) in British Columbia
10:30 AM		Refreshments
10:45 AM		<u>Reichley</u> - Fish health challenges in large-scale rainbow trout production
11:00 AM		
11:15 AM		<u>Morrison</u> - History and future of Integrated Pest Management (IPM) in British Columbia
11:30 AM		
11:45 AM		<u>Hickey</u> - Western Washington Treaty Tribe's Pacific Salmon Enhancement Programs
12:00 PM		
12:15 PM		AAFV Business Lunch
12:30 PM		



8th International Symposium on Aquatic Animal Health

September 2-6, 2018 - Charlottetown, Prince Edward Island, Canada



The Early Years of Salmon Farming Medicine in the US: Practice and Politics

Hugh Mitchell

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Salmon farming veterinary medicine began in Maine and Washington State in the mid- to late '80's. Initially in Maine, the major farms were venture capital funded, with uneven stockmanship acumen together with a host of colorful characters. Fish health was very "pathogenocentric" and policies and regulations did not often encompass a fully-integrated approach to fish health. The message that practitioners seemed to have to continually promulgate was one of: "Presence of the pathogen does not mean the presence of disease". The fish health learning curve was steep, and many of the current issues (e.g.: sea lice dermatitis and Infectious salmon anemia) hadn't yet entered the picture. One by one, existing disease issues of the early days were figured out and solved. How to cost-effectively injection vaccinate large numbers of hatchery fish was a key component in managing several diseases. Furunculosis and cold water vibriosis were two diseases mitigated with successfully integrated strategies. The dearth of FDA-approved pharmaceuticals for farmed fish was alleviated by ready and quick access to Emergency INAD solutions from the FDA. Anti-salmon farming activism was present but extremely low key and interaction of farmed and wild salmon diseases was rarely voiced as a concern. The lecture will conclude with a flash-forward to the future, a quick review of current top disease issues, current regulatory policies, politics and anti-farming activism efforts, especially with respect to the focus on disease issues. With the advancement in genomic technology, a reinterpretation of the message from the early days might be: "Presence of a pathogen's DNA doesn't necessarily mean infection or disease".

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Presentation Format: (Oral)



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(Withdrawn)

Potential Impacts of Environmental Change on Atlantic Salmon in British Columbia.

Barry Milligan

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Two potentially significant production concerns in Atlantic salmon include “winter ulcers” and maturation. Depending on severity both types of downgrades can have significant impacts on health, growth and sales price resulting in more than 20 percent loss in stock value. In the last seven years there has been a significant increase in the prevalence of both winter ulcers and maturation in stocks farmed by Cermaq Canada in open saltwater net pens. During this period the level of downgrades due both to winter ulcers and maturation more than doubled. Maturation levels have been successfully reduced through photo manipulation. Winter ulcer levels appear to have been successfully reduced through importation of intra-peritoneal vaccines for *Moritella viscosa*. The broader potential impact of environmental variability (oxygen, temperature, salinity) on fish health, production, and husbandry will be discussed.

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The Risk to Farmed Atlantic Salmon of Wild Piscine *Orthoreovirus* (PRV) in British Columbia

Patrick Whittaker*, Matthew Patterson, Tim Hewison

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Grieg Seafood BC Ltd, has tested all groups of smolts for piscine orthoreovirus (PRV) before going to the marine environment since Aug 2015 (n=88 pools by PCR). All samples have tested negative for PRV, whether taken from fish produced within our hatcheries, or externally purchased smolts (5 hatchery sources). Smolts were then tested from each region within three months of entry into the marine environment. This is followed up by regional testing until samples become positive. Grieg Seafood BC farms with a single year class stock in some geographically unique regions, most not bordering other salmon farming companies. The source of infection is theorized to be wild fish, potentially salmonids. Despite evidence of eventual PRV infection, no clinical disease attributable to PRV has been seen in any of the populations of fish.

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Fish Health Challenges in Large-Scale Rainbow Trout Production

Stephen R. Reichley*, Stacy G. King and Andy Morton

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Rainbow trout farming has a long history in the United States. In September of 1966, Ted Eastman and a group of investors started Clear Springs Trout Company. In 1991, the company name was changed to Clear Springs Foods, Inc. In August of 2000, ownership changed from a closely held private company to a privately-held employee-owned company. Today, Clear Springs Foods is the leading producer of premium rainbow trout, processing over 20 million pounds a year and has over 300 employee-owners. Clear Springs is a vertically-integrated company with brood operations, farm operations, feed manufacturing, processing plants, refrigerated truck distribution fleet, sales and marketing, and research and development. While seafood companies face many challenges, fish health and infectious diseases are one of the major impediments to global aquaculture. This talk will provide an overview of the fish health challenges due to infectious diseases (viral, bacterial, and parasitic) facing the largest producer of freshwater rainbow trout in the United States. Prevention and control strategies for these infectious diseases will also be discussed.

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History and future of Integrated Pest Management (IPM) in British Columbia

Diane B Morrison *

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Salmon farming in the coastal waters of British Columbia (BC) Canada has been in operation for over 30 years. In the 1980's the industry moved from rearing Pacific salmon (*Oncorhynchus tshawytscha*, *Oncorhynchus kisutch*) to the species of choice for farming, Atlantic salmon (*Salmo salar*). Around the same time there was an increase in environmental activism against salmon farming, which has resulted in extreme polarization of opinions on the value and risk of salmon farming in BC.

Sea lice (*Lepeophtheirus salmonis*) will be used as an example to illustrate how opponents of salmon farming have driven research dollars and regulatory focus, how the industry has responded and how a lack of political support has hindered pest management on the farms. The required components of IPM will be discussed with examples of how the BC industry is able to apply them. Data from sea lice monitoring, treatment efficacy, bioassay and genetic testing will be used to highlight the need for full implementation of IPM components. In 2014 the first hydrogen peroxide (Interox[®] Paramove 50[®]) permit was granted for one production area. Data from areas where hydrogen peroxide has been incorporated into an IPM plan will be presented and discussed.

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Western Washington Treaty Tribes' Pacific Salmon Enhancement Programs

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The 1974 *United States v. Washington* case, also known as the Boldt decision, reaffirmed the right of treaty tribes in western Washington to co-manage their natural resources, including Pacific salmon, alongside state and federal agencies. Today, over forty years later, the western Washington treaty tribes are leading the effort to preserve Pacific salmon populations in the Pacific Northwest. Tribes maintain sustainable fisheries, restore destroyed and degraded habitat, keep captive brood populations for threatened and endangered stocks, and run hatchery programs to enhance wild runs. These activities require fish health services, and ultimately resulted in the creation of the Northwest Indian Fisheries Commission (NWIFC) and its Tribal Fish Health Program.

The NWIFC is a tribal natural resources management support service organization for 20 treaty Indian tribes in western Washington. One service provided to tribes by the NWIFC is the Tribal Fish Health Program (TFHP). The TFHP consists of a fish health program manager, a program veterinarian, two field fish pathologists, and two microbiologists, as well as a fish health laboratory with cell culture and molecular diagnostic capabilities. The TFHP provides a number of different fish health services to member tribes, including broodstock spawning surveillance, routine fish health checks, disease investigation, and educational workshops.

Tribes are becoming increasingly involved in managing their natural resources, and with this increased involvement comes new opportunities for veterinarians to provide fish health services, as well as opportunities for collaboration for veterinarians providing fish health services for local, state, and federal agencies.

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