

# Liver Fluke Disease: Prevalence and distribution of associated pancreatic and hepatobiliary pathological findings in subsistence harvested bearded seals (*Erignathus barbatus*) and ringed seals (*Phoca hispida*) from the North Slope Borough and Bering Strait Region of Alaska

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Liver fluke disease was first described in a bearded seal from Barrow, Alaska, in 1979 by Bishop (JWD 1979;15:285-293). The liver fluke (*Orthnosplanthus spp.*) life cycle and identity of intermediate hosts in the Arctic is not well known. Tissue samples from 2008 to 2016 of subsistence harvested (mixed age and sex cohort) bearded seals [liver (n=122); pancreas (n=110)] and from ringed seal [liver (n=76); pancreas (n=63)] were collected and analyzed.

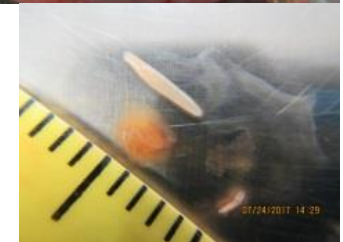
Our findings confirm liver fluke disease is common in subsistence harvested bearded seals, but remains absent in ringed seals (see Table 1). Note: Adjacent ringed seal populations (e.g. Sea of Okhotsk, Eastern Canada) are known to harbor liver flukes.

Table 1. Prevalence (prev) of liver fluke-related histopathological findings in bearded seals from the North Slope Borough and Bering Strait Region of Alaska between 2008 and 2016.

System and Tissue	Time Period 2008-2010		Time Period 2011-2016		Combined 2008-2016	
	#	Prev	#	Prev	#	Prev
<b>PANCREAS</b>	45		65		110	
Pancreatic periductitis/ductitis with or without fibrosis		7%		35%		24%
<i>Orthnosplanthus spp.</i>		42%		22%		30%
Pancreatic atrophy/fibrosis (post-parasitic)				9%		5%
<b>HEPATOBILLIARY SYSTEM</b>	54		68		122	
Periportal hepatitis/cholangitis/ cholangiohepatitis with or without fibrosis		4%		24%		15%
<i>Orthnosplanthus spp.</i>		33%		21%		26%
Common bile duct/hepatic bile duct mucosal hyperplasia		6%		15%		11%



Left: Cross-section of bearded seal liver (2017 BS 0719 HC) with thickened bile ducts due to chronic liver fluke infection. Below: Image of liver fluke, *O. arcticus*, specimen from same animal.



## Gross Examination for Liver Fluke Disease

**Liver:** lumpy, ropy texture of liver lobes, thickened bile ducts on cross section, thickened (pasty) consistency of bile acid within intrahepatic ducts, firmness, atrophy

**Pancreas:** pale discoloration to atrophy

**Blubber:** rare discolored orange to yellow (cholestatic jaundice)

**Acknowledgements:** This study was funded by qualified outer continental shelf oil and gas revenues by a substantial grant from the Coastal Impact Assistance program, U.S. Fish and Wildlife Service, US. Department of the Interior, and the North Slope Borough. All tissues were collected under NMFS Permit # 814-1899-00 or NMFS Permit # 17350-01. Many thanks to the subsistence hunters from the North Slope Borough and the Bering Strait Region who allow us to sample their harvest. We could not do this work without you. -Quyanaq!