

Comparison of Primary (Screening) and Confirmation Methods for Pathogen Detection in Fish Species

Organism	Common Name of Disease	Screening & Confirmation Method	NWFHS Manual Second Edition (2004)	USFWS Handbook- 2 nd Edition (2003)	AFS-FHS Bluebook 5 th Edition (2003)	OIE Manual 4 th Edition (2003)
Infectious Hematopoietic Necrosis Virus	IHN	Screening	TC (15°C) EPC,CHSE	TC (15°C) EPC	TC EPC,CHSE,FHM	TC (15°C) EPC,BF-2
		Confirmation	SN, IFAT, PCR Immunoblot	SN, IFAT, PCR	SN, FAT,PCR, IHC,ELISA, Immunoblot	SN, IFAT, PCR DNA Probe, ELISA
Infectious Pancreatic Necrosis Virus	IPN	Screening	TC (15°C) EPC,CHSE	TC (15°C) CHSE	TC BF-2,CHSE, RTG-2	TC (10-15°C) BF-2,CHSE, RTG-2
		Confirmation	SN, IFAT, PCR Immunoblot	SN, IFAT, PCR	SN, FAT, ELISA, Immunoblot	SN, IFAT, ELISA
Viral Hemorrhagic Septicemia Virus	VHS	Screening	TC (15°C) EPC,CHSE	TC (15°C) EPC	TC EPC,CHSE,FHM, RTG-2	TC (15°C) BF-2,RTG-2, EPC,FHM
		Confirmation	SN, FAT, PCR DNA probe (NA), Immunoblot	SN, IFAT, PCR	SN, FAT,ELISA Immunoblot,	SN, FAT, ELISA, PCR
Infectious Salmon Anemia Virus	ISA	Screening	TC (15°C) EPC/CHSE	TC (15°C) SHK-1	TC (16°C) CHSE, SHK	PCR, TC (20°C) CHSE, SHK
		Confirmation	PCR	IFAT, PCR	SN, IFAT,PCR	IFAT, PCR

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Largemouth Bass Virus ¹	LMBV	Screening	TC (15°C) FHM,EPC	TC (20-25°C) FHM,BF-2	TC FHM,BF-2	N/A
		Confirmation	PCR, SN, FAT, Immunoblot	PCR	PCR	N/A
Spring Viremia of Carp Virus	SVCV, Inf. Carp Dropsy	Screening	TC (20-25°C) EPC	TC (20-25°C) EPC	TC (22-25°C) EPC or FHM	TC (20°C) EPC or FHM
		Confirmation	PCR, SN, FAT, Immunoblot	SN, PCR	SN, PCR, IHC,ELISA	SN, PCR, IFAT, ELISA
White Sturgeon Herpesvirus ¹	WSHV	Screening	TC (20°C) WSS-2	TC (20°C) WSS-2	TC WSS-2	N/A
		Confirmation	Send to reference lab for confirmation	Send to reference lab for confirmation	None listed	N/A
White Sturgeon Iridovirus	WSIV	Screening	TC (20°C) WSS-2	N/A	N/A	TC (20°C) WSS-2, WSSK-1
		Confirmation	Send to reference lab for confirmation	N/A	N/A	SN, IFAT
<i>Oncorhynchus Masou</i> Virus ¹	OMV	Screening	TC (15°C) CHSE	TC (15°C) CHSE	TC CHSE	TC (10-15°C) RTG-2, CHSE
		Confirmation	PCR, SN, FAT, Immunoblot	PCR or send to reference lab for confirmation	PCR	PCR, SN, IFAT, ELISA,

¹ USFWS/AFS Standard Procedures for Aquatic Animal Health Inspections (Section 2 - in Bluebook)

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<i>Yersinia ruckeri</i>	Enteric Redmouth Disease (ERM)	Screen	Bacterial culture of kidney/spleen (BHIA)	Bacterial culture of kidney (TSA or BHIA)	Bacterial Culture	N/A
		Confirm	FAT, Agglutination	FAT	FAT, PCR	N/A
<i>Aeromonas salmonicida</i>	Furunculosis	Screen	Bacterial culture of kidney/spleen (BHIA)	Bacterial culture of kidney (TSA or BHIA)	Bacterial culture of kidney (TSA or BHIA)	N/A
		Confirm	FAT, Agglutination	FAT	FAT, Agglutination,	N/A
<i>Edwardsiella ictaluri</i>	Enteric Septicemia of Catfish (ESC)	Screen	Bacterial culture of kidney/spleen (BHIA)	Bacterial culture of kidney (TSA or BHIA)	Bacterial culture of kidney or brain (TSA, McConkeys, blood agar, or EIM)	Bacterial culture of kidney or brain (EIM)
		Confirm	FAT, Agglutination	FAT	Agglutination, FAT, ELISA	Agglutination, ELISA, PCR
<i>Renibacterium salmoninarum</i>	Bacterial Kidney Disease (BKD)	Screen	Kidney ELISA	Kidney or ovarian fluid FAT	Smears of infected tissue, histological section	ELISA, FAT
		Confirm	PCR	Culture (SKDM-2), PCR	FAT, ELISA, Culture (SKDM-2), PCR	Culture (SKDM-2), PCR

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<i>Piscirickettsia salmonis</i>	Piscirickettsiosis	Screening	N/A	TC CHSE, Giemsa stained tissue impression	TC CHSE	TC (15-18C) CHSE or EPC, Giemsa stain IFAT, Histology
		Confirmation	N/A	IFAT, IHC, PCR	IFAT	TC, Giemsa stain, FAT, Histology, IHC, PCR
<i>Edwardsiella tarda</i>	Edwardsiella Septicemia	Screening	Bacterial culture of kidney (BHIA)	N/A	Bacterial culture	N/A
		Confirmation	FAT, Agglutination	N/A	FAT, Agglutination, ELISA	N/A
<i>Flavobacterium columnare</i>	Columnaris	Screening	Bacterial culture of kidney/spleen (TYES), Colony and cell morphology	N/A	Wet mount, Growth at 20°C (Cytophaga agar)	N/A
		Confirmation	FAT, Agglutination, PCR	N/A	Morphological, cultural and biochemical characteristics, PCR	N/A
<i>Flavobacterium psychrophilum</i>	Cold Water Disease	Screening	Bacterial culture of kidney/spleen (TYES), Colony and cell morphology	N/A	Culture (TYES) and biochemical tests	N/A
		Confirmation	FAT, Agglutination, PCR	N/A	Agglutination, IFAT, PCR	N/A

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<i>Myxobolus cerebralis</i>	Whirling Disease	Screening	Pepsin-trypsin digest	Pepsin-trypsin digest	Pepsin-trypsin digest	N/A
		Confirmation	Histology, PCR	Histology, PCR	Histology, PCR	N/A
<i>Ceratomyxa shasta</i>	Ceratomyxosis	Screening	Wet mount and observation of multicellular myxosporean trophozoites	Wet mounts of intestinal scraping	Wet mount of posterior intestine or ascites	N/A
		Confirmation	PCR, Histology	Detection of spores, PCR	Detection of spores, Serology (MAb), PCR	N/A
<i>Tetracapsula bryosalmonae</i>	Proliferative Kidney Disease (PKD)	Screening	N/A	Smears of kidney stained with Leishman-Giemsa or Lectin	Wet mount, Giemsa-stain	N/A
		Confirmation	N/A	Histology	Histology, Lectin stain, Serology (MAb)	N/A
<i>Bothriocephalus acheilognathi</i>	Asian Tapeworm	Screening	Microscopic exam (intestinal squash) characteristic morphology	Visualization of cestode (pyramidal scolex in the semi-contracted state)	Microscopic exam – characteristic morphology	N/A
		Confirmation	Positive morphology	Positive identification by use of a key	Characteristic Morphology	N/A

N/A = Not applicable (not listed)

Date Revised 12/2004

Test Abbreviations:

ELISA –Enzyme Linked Immunosorbent Assay
FAT – (direct) Fluorescent Antibody Test
IFAT- Indirect Fluorescent Antibody Test
IHC – Immunohistochemistry
MAb – Monoclonal Antibody
PCR – Polymerase Chain Reaction
SN – Serum Neutralization

Culture Media Abbreviations:

BHIA – Brain Heart Infusion Agar
EIM – *Edwardsiella ictaluri* Medium
SKDM-2 –Selective Kidney Disease
TSA – Tryptic Soy Agar
TYES – Tryptic Yeast Extract with Salts