

Proceedings of the
53rd Annual Pacific Northwest
Fish Culture Conference

HATCHERY REFORM



DECEMBER 3-5

December 3-5, 2002

Best Western Heritage Convention Center and Hotel
Bellingham, Washington

Conference Hosted By
Washington Department of Fish & Wildlife



Preface

The Washington Department of Fish and Wildlife is honored and privileged to host the 53rd annual Pacific Northwest Fish Culture Conference. Fish culturists, scientists and interested individuals from private, state, provincial, tribal and federal finfish hatchery facilities in the Pacific Northwest and elsewhere in North America have used this unique and informal conference for the exchange of information and ideas about all aspects of fish culture for the past 53 years. These conferences are hosted on a rotating basis by the various fish resource agencies in the Pacific Northwest. The subject matter generally focuses on topics directly applicable to fish culture, although many times the subjects spill over into management and research themes, which are intimately entwined with the science of fish culture. This conference is also used to renew old friendships, begin new ones, and develop personal contacts between those of common interest. All persons interested in fish husbandry are invited to attend and to actively participate.

To this year's participants, we welcome you to: Hatchery Reform !

These Proceedings contain abstracts and talks presented at the conference. They are unedited, contain progress reports of uncompleted programs, and, as such, should not be considered a formal peer-reviewed publication. Mention in these Proceedings does not indicate approval, recommendation, or endorsement of any proprietary product or material.

2002 Pacific Northwest Fish Culture Conference Staff Bellingham, Washington

Hosting Agency: Washington Department of Fish and Wildlife

Conference Co-Chairs: John Kerwin, Catie Mains and Rich Eltrich

Master of Ceremony: Doug Hatfield

Session Chairs: Ron Ballard, Rich Eltrich, Chuck Johnson, Hal Michael, Steve Roberts,
Paul Seidel, and Jack Tipping

Hotel Arrangements: John Kerwin

Registration: Cynthia Kaiser, Catie Mains, and Sheila Smith

Treasurer: John Kerwin

Trade Show: Chuck Johnson and Ted Thygesen

Audio/Visuals: Justin Secrist and Jim Jenkins

T-Shirts and Cups: Chuck Lavier and Rick Stilwater

Presentations, Posters, and Abstract: Andy Appleby and Justin Secrist

Presentation Reviews: Howard Fuss, Justin Secrist, and Jack Tipping

Agenda: Andy Appleby

Signs and Printing: Walt Cooper

Drawings and Door Prizes: Rick Stilwater and Mike Erickson

Meeting Minutes: Marla Page

Conference Committee: Kyle Adicks, Andy Appleby, Rich Eltrich, Doug Hatfield, John Kerwin, Chuck Johnson, Chuck Lavier, Catie Mains, Marla Page, Rick Stilwater, and Ron Warren

Acknowledgements

Registration: Sue Cochran, Carol Coleman, Lee Pilon, Steve Rogers, and John Sheahan

Web Information: John Burrows and Carol Turcotte

CD's: Justin Secrist and John Sheahan

Logo Design: Darrell Pruett

Best Western Lakeway Inn and Conference Center – Bellingham, Washington. Mr. Fred

Poppe- Proprietor, Ms Ellen Stephenson- Catering Manager, and Mr. Chris

Quimby – Banquet Manager and the hotel staff.

Pacific Northwest Fish Culture Conference Historical Record

<u>Year</u>	<u>Location</u>	<u>Host Agency</u>	<u>Chairperson</u>
1950	Portland, OR	U.S. Fish and Wildlife Service	Ted Perry
1951	Wenatchee, WA	U.S. Fish and Wildlife Service	Roger Burrows
1952	Seattle, WA	Washington Department of Fisheries	Bud Ellis
1953	Portland, OR	Fish Commission of Oregon	Fred Cleaver
1954	Seattle, WA,	U.S. Fish and Wildlife Service	Bob Rucker
1955	Portland, OR	Oregon Game Commission	John Rayner
1956	Seattle, WA	Washington Department of Game	Cliff Millenbach
1957	Portland, OR	U.S. Fish and Wildlife Service	Harlan Johnson
1958	Seattle, WA	Washington Department of Fisheries	Bud Ellis
1959	Portland, OR	Fish Commission of Oregon	Ernie Jeffries
1960	Olympia, WA	Washington Department of Game	John Johansen
1961	Portland, OR	Oregon Game Commission	Chris Jensen
1962	Longview, WA	U.S. Fish and Wildlife Service	Roger Burrows
1963	Olympia, WA	Washington Department of Fisheries	Bud Ellis
1964	Corvallis, OR	Oregon State University	John Fryer
1965	Portland, OR	U.S. Fish and Wildlife Service	John Halver
1966	Portland, OR	Fish Commission of Oregon	Wally Hubloul
1967	Seattle, WA	University of Washington	Loren Donaldson
1968	Boise, ID	Idaho Department of Fish and Game	Paul Cuplin
1969	Olympia, WA	Washington Department of Game	John Johansen
1970	Portland, OR	Oregon Game Commission	Chris Jensen
1971	Portland, OR	U.S. Fish and Wildlife Service	Marv Smith
1972	Seattle, WA	Washington Department of Fisheries	Dick Noble
1973	Wemme, OR	Oregon Fish Commission	Ernie Jeffries
1974	Seattle, WA	University of Washington	Ernie Salo
1975	Otter Crest, OR	Oregon State University	Jack Donaldson
1976	Twin Falls, ID	University of Idaho	Bill Klontz
1977	Olympia, WA	Washington Department of Game	Jim Morrow
1978	Vancouver, WA	U.S. Fish and Wildlife Service	Dave Leith
1979	Portland, OR	Oregon Department of Fish and Wildlife	Ernie Jeffries
1980	Courtenay, BC	Fisheries & Oceans Canada	Keith Sandercock
1981	Olympia, WA	Washington Department of Fisheries	Will Ashcraft
1982	Gleneden Beach, OR	National Marine Fisheries Service	Einar Wold
1983	Moscow, ID	University of Idaho & Idaho Department of Fish and Game	Bill Klontz & Evan Parrish
1984	Kennewick, WA	Washington Department of Game	Jim Gearheard,
1985	Tacoma, WA	U.S. Fish and Wildlife Service	Ed Forner
1986	Eugene, OR	Oregon Department of Fish and Wildlife	Chris Christensen
1987	Tacoma, WA	Washington Department of Fisheries	Will Ashcraft

<u>Year</u>	<u>Location</u>	<u>Host Agency</u>	<u>Chairperson</u>
1988	Richmond, BC	B.C. Ministry of Environment	Don Peterson & Peter Brown
1989	Gleneden Beach, OR	National Marine Fisheries Service	R.Z. Smith
1990	Boise, ID	Idaho Department of Fish and Game	Bill Hutchinson
1991	Redding, CA	California Department of Fish and Game	Ken Hashagen
1992	Wenatchee, WA	Washington Department of Wildlife & Alaska Department of Fish and Game	John Kerwin & Irv Brock
1993	Spokane, WA	U.S. Fish and Wildlife Service	Ed Forner
1994	Sunriver, OR	Oregon Department of Fish and Wildlife	Rich Berry
1995	Fife, WA	Washington Department of Fish & Wildlife	Larry Peck
1996	Victoria, BC	B.C. Ministry of Environment, Lands & Parks Department of Fisheries & Oceans, Canada	Don Peterson & Greg Bonnell
1997	Gleneden Beach, OR	National Marine Fisheries Service	R. Z. Smith
1998	Boise, ID	Idaho Department of Fish and Game	Tom Rogers & Tom Frew
1999	Seattle, WA	U.S. Fish and Wildlife Service	Ray Brunson
2000	Sacramento, CA	California Department of Fish and Game	Judy Urrutia
2001	Portland, OR	Oregon Department of Fish and Wildlife	Trent Stickell & George Nandor
2002	Bellingham, WA	Washington Department of Fish and Wildlife	John Kerwin, Catie Mains & Rich Eltrich