Great Plains Fishery Workers Association

ALBERTA – COLORADO – MANITOBA – MONTANA – NEBRASKA – NORTH DAKOTA – SASKATCHEWAN – SOUTH DAKOTA - WYOMING

Lethbridge, Alberta, Canada
January 26-28, 2009

GREAT PLAINS FISHERY WORKERS ASSOCIATION
2008/9 OFFICERS

President:	Jason Cooper, Alberta
Vice-President:	Brandon Kratz, North Dakota
Secretary/Treasurer:	Michael Bryski, Alberta
Sergeant-at-Arms:	Cam Wallman, Alberta

GREAT PLAINS FISHERY WORKERS ASSOCIATION - AGENDA

Day 1, Monday, January 26

Event	Time	Location
Registration	1:00-5:00 pm	Hotel Lobby Main Floor – Sandman Hotel
Hospitality Room	4:00-7:00 pm	Recreation Room Basement – Sandman Hotel
Fish Fry and Auction	7:00-11:00 pm	Alberta Room Main Floor – Sandman Hotel

GREAT PLAINS FISHERY WORKERS ASSOCIATION - AGENDA

Day 2, Tuesday, January 27

Event	Time	Location
Breakfast	6:30 - 8:00 am	Alberta Room Main Floor – Sandman Hotel
Registration	8:00 - 10:00 am	Hotel Lobby Main Floor – Sandman Hotel
Welcome	8:15 - 8:45 am	Alberta Room Main Floor – Sandman Hotel
Technical Sessions 1&2	8:45am- 12:05pm	Alberta Room Main Floor – Sandman Hotel
Lunch	12:05 - 1:15 pm	Alberta Room Main Floor – Sandman Hotel
Technical Sessions 3&4	1:15 - 4:15 pm	Alberta Room Main Floor – Sandman Hotel
Banquet and Entertainment	6:00 - 11:00 pm	Alberta Room Main Floor – Sandman Hotel

Day 3, Wednesday, January 28

Event	Time	Location
Breakfast	6:30 - 8:00 am	Alberta Room Main Floor – Sandman Hotel
Technical Sessions 5&6	8:15am –11:55am	Alberta Room Main Floor – Sandman Hotel
Business Meeting	12:00 - 1:15 pm	Alberta Room Main Floor – Sandman Hotel

GREAT PLAINS FISHERY WORKERS ASSOCIATION - AGENDA

Tuesday morning, January 27

6:30 – 8:00 BREAKFAST (Applied Aquatic Research Ltd.)

Time	Title	Speaker
8:45 – 8:50	**Session 1 – Fisheries Techniques I**	**Mike Blackburn** **Alberta Fish & Wildlife**
8:50 – 9:10	Pallid Sturgeon Population Assessment Project	Landon Holte Montana Fish Wildlife and Parks
9:10 – 9:30	Sampling gears of the Pallid Sturgeon Population Assessment Project	John R. Hunziker Montana Fish Wildlife and Parks
9:30 – 9:50	Spawning and associated movement patterns of pallid sturgeon in the lower Yellowstone River.	Dave Fuller Montana Fish Wildlife and Parks

9:50 – 10:10 COFFEE BREAK (Pisces Environmental Services Ltd.)

Time	Title	Speaker
10:10 – 10:15	**Session 2 – Ecological Indicators and Interactions**	**Adrian Meinke** **Alberta Fish & Wildlife**
10:15 – 10:35	Native mussels of Wyoming: Where'd this clam come from?	Gordon P. Edwards Jr. Wyoming Game and Fish Department
10:35 – 10:55	Factors affecting development of aquatic communities in mine pit lake systems in west-central Alberta	Rob Sonnenburg University of Lethbridge
10:55 – 11:15	Spatial variability of pond assemblages on whooping crane breeding grounds in Wood Buffalo National Park, Canada	Claire Classen Golder Associates
11:15 – 11:45	Walleye gone wild! Potential causes of unprecedented walleye production on Lake Winnipeg.	Derek Kroeker Manitoba Fisheries
11:45 – 12:05	Fish communities in Edmonton storm water management ponds	Daryl Watters Alberta Fish & Wildlife

12:05 – 13:15 LUNCH (Alberta Conservation Association)

GREAT PLAINS FISHERY WORKERS ASSOCIATION - AGENDA

Tuesday afternoon, January 27

Time	Title	Speaker
13:15 – 13:20	**Session 3 - Fish and Fish Habitat: Restoration and Enhancement**	**Meighan Kearns Golder Associates Ltd.**
13:20 – 14:00	Determining environmental flows for the South Saskatchewan River Basin, Alberta, Canada	Wendell Koning (40 min) Alberta Environment
14:00 – 14:20	Fish habitat use of Lanigan Creek and Last Mountain Lake, Saskatchewan	Aaron Schweitzer Fisheries and Oceans Canada
14:20 – 14:40	A fisheries and riparian assessment on the Raven River, Alberta	JR Hall Golder Associates

14:40 – 15:00 COFFEE BREAK (Stantec Consulting Ltd.)

Time	Title	Speaker
15:00 – 15:05	**Session 4 – Habitat Mitigation, Compensation, and Improvement**	**Harold Funk Golder Associates Ltd.**
15:05 – 15:35	Diversion dams and fish passage – don't give up the fight!	Mike Backes (30 min) Montana Fish Wildlife and Parks
15:35 – 15:55	Operational monitoring of the intake structure and fish return system at the EL Smith Water Treatment Plant- EPCOR	Shona Derlukewich Golder Associates
15:55 – 16:15	Effectiveness of aeration system on increasing dissolved oxygen level at Heinrich-Martin Dam in North Dakota	Kate Overmoe North Dakota State University

18:00 – 21:00 BANQUET (Alberta Sustainable Resource Development)

GREAT PLAINS FISHERY WORKERS ASSOCIATION - AGENDA

Wednesday morning, January 28

6:30 – 8:00 BREAKFAST (Pisces Environmental Services Ltd., Alberta Environment, Golder Associates, Alberta Union of Provincial Employees, Gateway Mechanical Services)

Time	Title	Speaker
8:20 – 8:25	**Session 5 – Fisheries Management**	**Dwayne Latty** **Alberta Fish & Wildlife**
8:25 – 8:45	What do Albertans know and think about fish and fish management?	Norine Ambrose Cows and Fish - Alberta Riparian Habitat Management Society
8:45 – 9:05	Dore Lake, Saskatchewan: a history of exploitation, numerous net surveys, and oh yes, cormorants	Gord Sedgewick Saskatchewan Fish & Wildlife
9:05 – 9:25	Sauger management for the middle Missouri River, Montana.	Bill Gardner Montana Fish Wildlife and Parks
9:25 – 9:45	Gaining fish one community at a time	Michael Gerrand (20-40 min) Cows and Fish - Alberta Riparian Habitat Management Society

9:45 – 10:30 COFFEE BREAK (Alberta Environment)
RAFFLE DRAWS and CHECK-OUT

Time	Title	Speaker
10:30 – 10:35	**Session 6 – Fisheries Techniques II**	**Vince Herron** **Lethbridge College**
10:35 – 10:55	Using snorkeling to survey lotic fish populations in southwest Alberta rivers	Ryan Popowich Golder Associates
10:55 – 11:15	Tar River fish salvage	Michael Day Golder Associates
11:15 – 11:35	Hydroacoustic adventures: a discussion of lessons learned relative to remote lakes, fish restoration, pelagic zone spatial partitioning and mapping littoral zone resources	James P. Harrison Westworth Associates Environmental Ltd.
11:35 – 11:55	Identifying bull trout populations and the origin of migrant individuals via novel genetic methods	Will Warnock University of Lethbridge

12:00 – 13:15 BUSINESS MEETING

GREAT PLAINS FISHERY WORKERS ASSOCIATION - AGENDA

Poster Title	**Author**
Density and abundance stock assessment of cutthroat trout in the upper Oldman Drainage using a random stratified sampling design: calculation of drainage density and comparison between catch and release and allowable-harvest fisheries	Jason Blackburn Alberta Conservation Association
Do you know Didymo?	Mike Bryski Alberta Environment
Monitoring an environmental mitigation project: walleye (*Sander vitreus*) stocking in Pine Coulee Reservoir	Mike Bryski Alberta Environment
Special harvest license for walleye in Lake Newell, Alberta	Cam Wallman Alberta Fish & Wildlife
Fisheries Management - Pigeon Lake	Jason Cooper Alberta Fish & Wildlife
Habitat improvements	Fisheries and Oceans Canada
The Pembina riverbank stabilization project and workshop	Fisheries and Oceans Canada and Alberta Infrastructure and Transportation
A population assessment for bull trout in the upper Oldman Drainage	Brad Hurkett Alberta Conservation Association
Factors affecting development of aquatic communities in mine pit lake systems in west-central Alberta	Rob Sonnenburg University of Lethbridge
Upper Kananaskis Lake - Canmore Area Fisheries Management - Assessment of the bull trout and cutthroat trout stocking program	Jim Stelfox Alberta Fish & Wildlife

GREAT PLAINS FISHERY WORKERS ASSOCIATION
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PREVIOUS ANNUAL WORKSHOP LOCATIONS

			20th	1971	Regina, SK	40th	1991 Lethbridge, AB
1st	1952	Georgetown Lake, MT		1972	Sheridan, WY		1992 Bismarck, ND
	1953	Fort Qu'Appelle, SK		1973	Calgary, AB		1993 Scottsbluff, NE
	1954	Sheridan, WY		1974	Minot, ND		1994 Deadwood, SD
	1955	Banff, AB		1975	Scottsbluff, NE		1995 Winnipeg, MB
	1956	Minot, ND		1976	Rapid City, SD		1996 Fort Collins, CO
	1957	Deadwood, SD		1977	Winnipeg, MB		1997 Bozeman, MT
	1958	Miles City, MT		1978	Denver, CO		1998 Moose Jaw, SK
	1959	Regina, SK		1979	Billings, MT		1999 Casper, WY
	1960	Casper, WY		1980	Regina, SK		2000 Lethbridge, AB
10th	1961	Lethbridge, AB	30th	1981	Cody, WY	50th	2001 Minot, ND
	1962	Dickinson, ND		1982	Lethbridge, AB		2002 Sidney, NE
	1963	Deadwood, SD		1983	Minot, ND		2003 Deadwood, SD
	1964	Red Lodge, MT		1984	Scottsbluff, NE		2004 Winnipeg, MB
	1965	Regina, SK		1985	Rapid City, SD		2005 Sterling, CO
	1966	Cody, WY		1986	Brandon, MB		2006 Glasgow, MT
	1967	Banff, AB		1987	Fort Collins, CO		2007 Moose Jaw, SK
	1968	Dickinson, ND		1988	Lewistown, MT		2008 Sheridan, WY
	1969	Rapid City, SD		1989	Regina, SK	58th	2009 Lethbridge, AB
	1970	Billings, MT		1990	Casper, WY		

Financial support and donations of goods and services are necessary to organize and convene the GPFWA Conference. Financial support pays for basic elements of the conference such as meals, venue costs, and entertainment. Financial support and donations of goods and services are also used to fund a student scholarship program either directly or from the proceeds of the traditional auction and raffle. An annual award is presented to a student enrolled in the Environmental Science program at Lethbridge College.

The Planning Committee thanks and acknowledges the following sponsors who provided financial support for the 2009 GPFWA Conference:

Alberta Sustainable Resource Development

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The Planning Committee wishes to thank and acknowledge the following vendors, organizations, and individuals who donated goods and services to the 2009 GPFWA Conference:

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Alberta Sustainable Resource Development, Fisheries Management, Prairie Area
Aquaculture Centre of Excellence – Lethbridge College
Environmental Science Department – Lethbridge College
VEMCO Division and AMIRIX Systems Incorporated
West Winds Fly Shop

The Planning Committee thanks Jenny Earle and Linda Winkel for their help with registration during the conference.

The Planning Committee also thanks the Sandman Hotel for hosting the 2009 GPFWA Conference and LA Chefs for providing all food service. We also wish to acknowledge Andrew Hilton Wine and Spirits for supplyiing beverages, Hypnosis on Tour for providing entertainment, Creative Awards for building the award plaques, and StitchFX for manufacturing the commemorative belt buckles.

GREAT PLAINS FISHERY WORKERS ASSOCIATION
PLANNING COMMITTEE

Jason Cooper, Alberta Sustainable Resource Development - President

Michael Bryski, Alberta Environment - Secretary/Treasurer

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Paul Christensen, Alberta Sustainable Resource Development

Jason Blackburn, Alberta Conservation Association

Paul Harper, Fisheries and Oceans Canada

Matthew Coombs, Alberta Sustainable Resource Development

Brad Hurkett, Alberta Conservation Association

John Derksen, Lethbridge College

Cam Wallman, Alberta Sustainable Resource Development

TECHNICAL PRESENTATIONS

Ambrose, Norine and Sandi Riemersma. What do Albertans know and think about fish and fish management?
Maintaining fish and their habitats is integral to maintaining healthy aquatic and terrestrial ecosystems, yet maintaining fish habitat is more about managing humans than managing fish directly. Land and water management and land uses influence fish and habitat, yet our understanding of people's knowledge and perceptions related to fish or fish habitat is very limited. This survey, involving 230 respondents, was designed to help resource managers interested in fish and fish habitat better understand the knowledge base and values placed on fish habitat and populations by Albertans, and thus improve delivery of programs designed to impact people and their land/water use or management practices. A wide diversity of individuals participated, with 46% of respondents involved mostly via recreational fishing.

Two thirds of individuals were not very familiar with different fish and their habitats. Only 26-56% of respondents could correctly identify whether six fish species were native or non-native. On basic natural history questions, as many as 44% answered incorrectly, including feeling that sand and silt covering the bottom of a waterbody actually helps fish eggs successfully hatch. These results indicate the need to increase knowledge to assist Albertans better understand fish and fish habitat.

Most people acknowledged that both urban and rural land use choices could negatively influence fish, yet almost no one felt they personally might have a major negative impact on fish. When asked to select the factors they felt were the greatest threat to fish and their habitat, lack of awareness among the public and domestic / industrial effluent were the two highest ranked threats. Based on the survey results, we see that personal responsibility to impacts on fish or fish habitat is generally lacking and this is an important area that needs to be emphasized in extension programs.

Backes, Mike. Diversion dams and fish passage – don't give up the fight!
The Tongue River, in southeastern Montana, is a major tributary to the Yellowstone River. Numerous Yellowstone River fish species utilize the Tongue River for spawning. However, like most river systems, diversion dams have limited fish migrations up this system. Through persistent efforts, measured in careers not years, fish passage around these diversion dams and complete removal of other dams is occurring on the Tongue River. T&Y Diversion dam, constructed in the mid 1880's, is the lowest dam on the Tongue River and is a complete fish barrier. It is located 20 river miles upstream from the confluence of the Tongue and Yellowstone Rivers. In the fall of 2007, a fish bypass (named Muggli Bypass) was completed to allow fish passage around T&Y Diversion Dam.

In 2008, from March through October, fish sampling was conducted to evaluate the success of this structure. A fyke net was utilized to sample fish that successfully navigated the complete length of the bypass channel. Electrofishing was conducted upstream and downstream of the diversion dam to compare relative abundances of fish in the river to those collected in the bypass. Nineteen fish species were successful in passing through the bypass during the sampling period and four additional species were collected in the bypass channel when it was block netted and drained. Comparatively, 29 fish species were collected downstream of the diversion dam. Sampling upstream of T&Y Dam

found four species (freshwater drum, goldeye, smallmouth buffalo and western silvery minnow) which have never been documented upstream of the dam. River flows greater than 1000 cfs limited some species from using the bypass. Alterations will be made to the bypass channel in 2009 to improve fish passage at higher flows. In summary, the Muggli Bypass is a noteworthy success story.

Classen, Marie-Claire. Spatial variability of pond assemblages on whooping crane breeding grounds in Wood Buffalo National Park, Canada.
The whooping crane (*Grus americana*) breeds in a vast wetland complex in Wood Buffalo National Park (WBNP), Canada. Joint conservation efforts between Canada and the United States, the crane's winter home, have increased the population from 16 individuals in the 1940's to 266 birds in 2008. The National Recovery Plan for the Whooping Crane and the International Recovery Plan for the Whooping Crane have outlined the need to monitor the wetland habitat characteristics and whooping crane prey, and relate this information to chick survival and opportunities for population expansion. To develop a prey monitoring program in the breeding grounds, we assessed spatial variation of fish and aquatic invertebrate assemblages by sampling ponds from seven areas within and around the breeding grounds. Crane-use of the seven areas was classified a priori as high-, low- or no-use. Statistical analyses indicated that prey composition in high-use ponds differed from both low- and no-use ponds, which did not differ. Dace and stickleback were present in high-use nesting area ponds and absent from ponds in both low- and no-use areas. Low- and no-use area ponds were dominated by invertebrate taxa such as dragonfly larvae and beetles.

Day, Michael. Tar River fish salvage.
In 2007, Golder Associates conducted a fish salvage of a nearly 40km long section of the Tar River, north of Fort McMurray, at the request of Canadian Natural Resources Ltd (Canadian Natural). The fish salvage was part of the construction activities involved in Canadian Natural's Horizon Oil Sands Project. The fish salvage involved a crew of up to 16 people and the removal of over 120,000 fish. The presentation will include discussions on techniques, challenges and the results of such a large fish salvage.

Derlukewich, Shona. Operational monitoring of the intake structure and fish return system at the EL Smith Water Treatment Plant- EPCOR
To meet the continuous growth supply and demand of the water supply for the city of Edmonton, EPCOR has upgraded their water intake program which required an additional pump house with a mid-river wedge type water intake system. The low lift pump house includes travelling screens, fish diversion weirs and a fish return system to exclude fish in the water treatment process.
Methods of field sampling included use of D-ring nets and Kalisco high speed Miller drift nets for collection of fish in the North Saskatchewan River and the Low Lift pump house. Objective of the river monitoring program determined fish species at risk of entrainment by the intake system. Low lift pump house monitoring included three locations: screen well, water entering the treatment facility; pump bay, water directed to the processing facility; fish return well, water directed into the fish return system. Discussions include results of the monitoring program and problems associated with sampling techniques.

Edwards Jr., Gordon P. Native mussels of Wyoming: Where'd this clam come from?
Freshwater mussels are inconspicuous but ecologically valuable. They are important bio-indicators with complex life cycles tied to many native fishes and illustrate striking evolutionary adaptations. North America hosts the world's highest diversity of freshwater mussels (over 300 species) but more than half of the native mussels in the Midwest U.S. are listed as threatened or endangered. Many mussels continue to decline. Wyoming remains in a discovery phase because no efforts have focused statewide on mussels. The Wyoming Game and Fish Department is statutorily charged with managing "all wildlife" (excluding insects) and current federal mandates such as the Comprehensive Wildlife Conservation Strategy require improved knowledge of non-game species such as mussels. A retired geology professor and a consulting archaeologist inspired awareness of Wyoming's native mussels, and continue providing valuable management guidance. Small-scale, unorganized surveys and the incidental observations of Department personnel have provided a window into species distributions, but our data lacks spatial continuity and prohibits confident population assessments. At least seven species of freshwater mussels are known to inhabit Wyoming waters, including fatmucket, giant floater, cylindrical papershell, western pearlshell, white heelsplitter, California floater, and plain pocketbook. Living specimens of the latter three species were only discovered since the fall of 2007. A potential eighth species, the black sandshell, was discovered in the recent fossil record with other extant species in 2006. Wyoming arranged an agreement with the University of Colorado Museum to curate a voucher collection of its mussels. A State Wildlife Grant project was proposed to initiate standardized baseline surveys for native mussels in 2010 throughout Wyoming.

Fuller, Dave. Spawning and associated movement patterns of pallid sturgeon in the lower Yellowstone River.
Documentation of pallid sturgeon (*Scaphirhynchus albus)* spawning Recovery Priority Management Area 2 (RPMA2) in the upper Missouri River was previously inconclusive and recruitment in this area has not been documented in 30+ years. The objectives of this study were to: 1) describe movements and habitat selection of pre-spawn and spawning-stage female pallid sturgeon, 2) identify pallid sturgeon spawning reaches within rivers (e.g., Missouri River, Yellowstone River), 3) document reproduction of pallid sturgeon, and 4) determine spawning periodicity (i.e., years between spawning events) of female pallid sturgeon. In 2007, fifteen adult pallid sturgeon (two gravid females, one non-gravid females, twelve males) were intensively tracked in the lower Yellowstone River. Female pallid sturgeon did not spawn at the most upstream location. Non-spawning migrations were not similar to spawning migrations. Aggregations of males and changes in movement patterns of females appeared to have indicated spawning time and location. Steroid levels and biopsies verified spawning of both gravid females. Spawning most likely occurred approximately three days after maximum discharge and when temperatures were 20oC. D-net sampling for eggs and larvae occurred in areas below aggregations. This sampling resulted in a total of 458 paddlefish larvae, 107 *Scaphirhynchus* larvae, 9 unknown Acipenserform larvae, and 56 Acipenserform eggs and embryos. All *Scaphirhynchus* larvae, unknown larvae, and 42 eggs and embryos were sent to the USFWS Abernathy Fish Technology Center for genetic confirmation as pallid sturgeon or shovelnose sturgeon (results pending). Female pallid sturgeon appear to spawn every 2-3 years. Results from this study indicate that the Yellowstone River is suitable for pallid sturgeon spawning. Findings of this study will help to identify the bottleneck of pallid sturgeon recruitment in the upper Missouri basin.

Gardner, Bill. Sauger management for the middle Missouri River, Montana.
Sauger declined in abundance and distribution throughout the state over the past years especially during the late 1980's. This decline directed considerable interest to find out the causes and develop strategies for restoring the populations. This paper will summarize the sauger conservation program for the Middle Missouri River and present information on management and research being conducted here.

Gerrand, Michael. Gaining fish one community at a time.
Ambling along with imagery and narrative, this presentation will demonstrate how three small watershed groups along the Eastern Slopes of SW Alberta have managed to rebuild community trust and improve the health of their watersheds. Along the way they have started learning what it takes to restore a trout fishery in their creek. Cows and Fish has been working with these community groups since 2001, three of about 70 watershed groups we work with throughout the province. Cows and Fish is a non-profit society striving to foster a better understanding of riparian areas and their ecological function, thus, enabling landowners to make informed management decisions that enhance landscape health and fish habitat. The Cows and Fish approach, or process, is how we work with communities to try and achieve these goals. The Cows and Fish approach is about establishing trust. It creates partnerships, and allows landowners to build a cumulative body of information before moving on to identifying and addressing land use issues. However, this pathway is not set in stone as we continue to benefit from the wisdom of people who understand the landscape better than anyone, landowners and producers. During this presentation some of these lessons will be humbly revealed. In the 'time-tested fashion' of Cows and Fish, this presentation is heavy on images and light on bar graphs and bullet-ridden power point slides. Hear tips for improving ecological literacy and discover tools that assist communities to move from education to action. Just as a creek's meandering path through it's floodplain is its secret to balancing energy and erosion, the Cows and Fish approach is our secret to working with communities who love their fish enough to make the changes required to restore and protect their local fish habitat.

Hall, JR. A Fisheries and riparian assessment on the Raven River, AB.
In association with Trout Unlimited Canada (TUC), the Alberta Conservation Association (ACA), and the Alberta Riparian Habitat Management Society (Cows and Fish), Golder Associates Ltd. (Golder) conducted an investigation of fish and fish habitat on the Raven River during the summer and fall of 2008. The project was jointly funded by the Lloyd Shea Memorial Fund (administered by TUC) and the ACA. The Memorial Fund was established to honour Lloyd Shea an ardent fly-fisher who was dedicated to supporting the protection and enhancement of the brown trout fishery in the Raven River. The project was carried out using a multi-faceted approach, portions of which were patterned after an earlier study conducted by the Alberta Fish and Wildlife. The earlier study was completed prior to the construction of the Dickson Dam on the Red Deer River, which had the potential to alter fish species composition and abundance in the Raven River. During 2008, fish populations were investigated using: i) survey-level electrofishing to assess spatial distribution and relative abundance, ii) mark-recapture sampling to estimate the density of key sport fish species (brown trout, brook trout, mountain whitefish), and iii), a volunteer-based redd survey. Combined, the data will allow for a comparison between current population data and the earlier data-set. In recognition of the importance of riparian habitat to the proper functioning and health of the fishery, a riparian habitat inventory (RHI) was carried out on 10 representative sections of the Raven River by Cows and Fish, and low-level videography (ultra-light aircraft) was undertaken in a 100 km

section of river. The project provided a current "snap shot" of the fish and riparian resources in the Raven River., and identified a number of areas and opportunities for restoration and improvement

Harrison, James P. Hydroacoustic Adventures: a discussion of lessons learned relative to remote lakes, fish restoration, pelagic zone spatial partitioning and mapping littoral zone resources.
The discussion will include a brief overview of works conducted in support of the Adirondack Effects Assessment Project (EPA Funded) and the Lake George Littoral Zone Project (funded by the Lake George Park Commission), both recently conducted in upstate NY. Works related to the AEAP project will include a discussion on gear, realities of the constraints, and overall applicability for fish and zooplankton movements and population estimates. Works related to the LGLZ project will include a discussion on gear, applicability for mapping littoral zone resources, and applications for SAV identification and management. The majority of this work was completed during two post doctoral assignments at the Darrin Fresh Water Institute, a research arm of Rensselaer Polytechnic Institute.

Holte, Landon. Pallid Sturgeon Population Assessment Project.
A general overview of the Pallid Sturgeon Population Assessment Project that currently finished its third field season of work on the Missouri River below Fort Peck Dam to the North Dakota border. The project is designed to look at two main goals: to provide the information to detect changes in pallid sturgeon and native target species populations in the Missouri River Basin and to provide the information to determine habitat preferences over time for pallid sturgeon and native target species in the Missouri River Basin. This talk will give a general overview of the project, the area that is being worked on, and some results of pallid sturgeon data that has been found in the last three field seasons.

Hunziker, John R. Sampling gears of the Pallid Sturgeon Population Assessment Project.
The Pallid Sturgeon Population Assessment Program uses a variety of sampling gears. The sampling gears fall into three categories: standard (trammel net, otter trawl and mini-fyke net), wild (bag seine, beam trawl, angling, trotlining), and experimental (push trawl). Standard gears are used by all crews throughout the program, while wild gear use is determined by individual crew leaders. Experimental gears are used in comparison with a standard gear. Standard gears are designed to sample a variety of habitats while targeting both sturgeon and fish community assemblages. Wild gears allow for the flexibility of individual crews to explore and facilitate new sampling techniques.

Koning, C. Wendell, Allan G. H. Locke, and John M. Mahoney. Determining Environmental Flows for the South Saskatchewan River Basin, Alberta, Canada.
The Province of Alberta recently introduced a Water Management Policy for the South Saskatchewan River Basin that called for determination of the maximum amount of water that can be allocated for irrigation and other uses in the Red Deer, Bow, Oldman, and South Saskatchewan River sub-basins. Part of this process was the requirement to determine the environmental flows (also called instream flow needs) for protection of the aquatic environment. Environmental flow determinations were developed to reflect the seasonal pattern and general changes in magnitude, frequency, timing and duration of the natural flow hydrograph both within a year and between years,

i.e., intra- and inter-annual variability of flow. The intent was to provide flow values based on the ecological need for natural flow variation. To meet these expectations, four ecosystem components were chosen to represent the full extent of the aquatic ecosystem: water quality (mainly stream temperature and dissolved oxygen), fish habitat (based on resident sportfish), riparian vegetation (primarily for cottonwood tree communities), and channel maintenance (movement of stream substrate). The environmental flow values for each of the individual components were integrated to produce an ecosystem based value. The final flow values were generated for 27 reaches in the SSRB using a weekly time-step in a flow duration curve format (in total, 1404 flow curves). There were technical and socio-economic challenges in the process.

Kroeker, Derek. Walleye gone wild! Potential causes of unprecedented walleye production on Lake Winnipeg.

Lake Winnipeg is the 10th largest lake in the world (by area). It supports the second largest freshwater commercial fishery on the continent as well as a subsistence fishery, and a minor recreational fishery. Walleye are the most prized species for each segment of users. Commercial production of walleye has increased 9 of the past 10 years and is now at the highest levels ever recorded in the 120 year history of commercial fishing on the lake. Some potential causes of the increase in walleye production include: accelerated eutrophication, invasive species, high run-off / lake levels, climate change, the 1997 flood, and management actions.

Overmoe, Kate. Effectiveness of aeration system on increasing dissolved oxygen level at Heinrich-Martin Dam in North Dakota

The Great Plains region of North Dakota is a host to many problems of water quality with respect to eutrophication, a combined process caused by excess nutrients and enhanced plant growth. The Heinrich-Martin Dam located in LaMoure County, ND was built in 1964. The recreational reservoir created by the dam covers and area of 18.8 acres. With an average depth of 14 feet and a deepest depth of over 35 feet, the reservoir is small but deep. In recent years, water quality in the impoundment has declined dramatically, particularly dissolved oxygen (DO) concentrations. The lowest DO concentration was found close to 0 mg/L in 2005. Low DO levels can reduce habitat availability and reduce survival of organisms in the water, possibly resulting in fish kills . An aeration system was installed by North Dakota Game and Fish in 2006 to increase the DO levels by diffusing air and generating air circulation in the water. An extensive weekly water quality monitoring was conducted in 2008 to evaluate the effectiveness of the aeration system. The results indicated that aeration system is effective in eliminating temperature stratification and improving DO levels at the Heinrich-Martin Dam. A gradual increase of nutrient (nitrogen and phosphorus) level and extensive algal and weed growth were observed in the summer months. Further analysis on sediment samples showed high organic content indicating that the major consumption of oxygen is from the sediment oxygen demand. Sediment decomposition could have served as a major internal source of nutrients that stimulated algal growth. The situation implies that the aeration system was temporarily effective but will not permanently eradicate the eutrophication process in the impoundment.

Popowich, Ryan. Using snorkeling to survey lotic fish populations in southwest Alberta rivers.

Snorkeling is an inexpensive, non-invasive technique that has a number of applications when surveying fish populations in lotic systems. This presentation will focus on recent surveys of mountain whitefish conducted on the Elbow and Sheep rivers, AB, but will also summarize projects in the area that have integrated snorkeling. Specific goals of recent work were to map the distribution of congregations of staging fish, determine the timing of spawning, and provide an estimate of population size. Secondary objectives were to count and map the distribution of fluvial bull trout redds and other fishes. Data were collected by a single snorkeler and a data recorder piloting a small boat. Fish identification and counts were the exclusive responsibility of the snorkeler while the observer provided supplemental observations (e.g., redd identification) and guided the snorkeler towards areas likely to hold congregations of mountain whitefish. Efforts were made to quantify the snorkeler's field of view and maintain consistency in estimating fish size. This work has resulted in the identification of important habitat for staging/spawning mountain whitefish, spawning bull trout, and has shown that populations of fluvial bull trout are increasing in both the Elbow and Sheep rivers.

Schweitzer, Aaron. Fish habitat use of Lanigan Creek and Last Mountain Lake, Saskatchewan.

Lanigan Creek is the second largest tributary to Last Mountain Lake which is located 40 km northwest of Regina, SK. During the early 1970's a dam was built on Lanigan Creek approximately 1km upstream from it's confluence with Last Mountain Lake. The dam is located within the boundaries of the Canadian Wildlife Service - Last Mountain Lake National Wildlife Area where it creates a permanent wetland, intended to increase waterfowl production in the area. The dam is a permanent barrier to fish spawning migrations from Last Mountain Lake, one of the most frequently fished waterbodies in Saskatchewan. To gain a better understanding of how fish would use habitat within Lanigan Creek upstream of the dam (provided future fish passage is achieved) 200 northern pike and 25 walleye were implanted with passive integrated transponders (PIT tags) and released upstream of the dam during spring spawning migrations. In addition, 53 northern pike were PIT tagged and released on the downstream side of the dam. PIT tag antennae were setup upstream and downstream of the dam to monitor fish movement. Of the PIT tagged fish released upstream of the dam; 12 northern pike and 11 walleye were also implanted with radio telemetry transmitters (radio tags). Radio tagged fish were tracked by ground, boat and air to determine fish location in Lanigan Creek and Last Mountain Lake. Of the northern pike and walleye released upstream of the dam, most returned to Last Mountain Lake within two weeks following initial spawning migrations. Northern pike that were released downstream of the dam spent on average 3 days in the scour pool below the dam prior to leaving the area. Within two months of being tagged and released upstream of the dam on Lanigan Creek, radio tagged northern pike and walleye migrated up to 80 km and 35 km respectively within Lanigan Creek and Last Mountain Lake.

Sedgewick, Gord. Dore Lake, Saskatchewan: a history of exploitation, numerous net surveys, and oh yes, cormorants.

The commercial, and later recreational, exploitation of the fish resource in Dore Lake began modestly enough in the early 1900's, as rail lines and settlements expanded into northern Saskatchewan. The winter months allowed for the frozen product to be delivered to the nearest railhead (Prince Albert), initially by dog and horse sleighs, and later by "cat swings", or caterpillar

tractors. By 1920 the commercial fishery was well established. The mink fur farm industry on the lake began in 1940 with one operation, expanded rapidly to include 10 ranches in the 1950's and 1960's, with the industry collapsing and finally petering out in the 1980's. Improvements in road access in the 1950's opened the lake to the development of a sport fishery (based on the large walleye population then present in Dore Lake), initiating yet a third source of high demand on the fishery resource in Dore Lake. In 1956 a biological survey was carried out (Ruggles, C. P. 1959-3), to assess the habitat and to determine the state of the fish stocks under siege. Numerous surveys have been done since; the latest occurring in July 2008. The presentation, hopefully, will provide an historical overview of the impact of exploitation on certain fish species in Dore Lake, the resulting changes in species abundance, the eventual collapse and slow recovery of the walleye population, and the resilience of the pike and whitefish populations, evident in the results and conclusions of the numerous reports.

Sonnenberg, Rob. Factors affecting development of aquatic communities in mine pit lake systems in west-central Alberta.

Coal mining has occurred on the Alberta landscape for over 100 years, resulting in significant environmental impact. In response to these impacts, mitigation and reclamation practices have evolved and may now include the addition of mine pit lakes into high elevation stream systems (lake and streams). Research being undertaken in this study examines and measures aquatic responses in these modified environments. The study area is situated south of Hinton, Alberta, in the Gregg River watershed. The Gregg River is a tributary to the McLeod River, which is part of the Athabasca River basin. Coal mining activities have impacted several tributaries and the headwaters of the Gregg River. Pit lakes now occur on Sphinx Creek and Falls Creek, which are both tributaries to the Gregg River. Physical, chemical and biological parameters are being investigated, including weather, habitat, water quality, fish populations, invertebrates, microphytes and macrophytes. Preliminary findings include the first observation of recruitment of rainbow trout into a previously fishless system, and higher population densities of fish downstream of pit lakes. Field investigations are scheduled to be completed by the fall of 2009.

Warnock, Will. Identifying bull trout populations and the origin of migrant individuals via novel genetic methods.

Identification of genetic population structure is a central consideration in salmonid fish management. New genetic clustering methods based on Bayesian models were used to reveal population structure in the core of the bull trout range of South-West Alberta. This method of population identification is a more parsimonious alternative to traditional techniques that define populations a priori by spawning stream. Populations identified by both genetic clustering and traditional methods were then used as reference populations for genetic assignment of 85 mainstem-caught adult bull trout. Assignment confidence was higher when using populations defined by genetic clustering methods. These methods used in tandem are powerful tools, and are becoming increasingly accessible for use in practical fisheries management.

Watters, Daryl. Fish communities in Edmonton storm water management ponds.

Non-native fish species are known to occupy some City of Edmonton storm water management ponds (SWMP). Two species, threespine stickleback (*Gasterosteus aculeatus*) and goldfish (*Carassius auratus*) are considered non-native invasive species. An invertebrate, northern crayfish (*Orconectes*

virilis), is indigenous to the Saskatchewan River drainage and is known to occur in the North Saskatchewan River (NSR) at Edmonton; however, this species is also considered invasive in upland SWMPs draining to the NSR. During 2007 and June 2008 Alberta Fisheries Management staff undertook a systematic assessment of SWMPs to determine presence of native and non-native species, identify potential risk of escapement and evaluate the possible need for control or elimination of non-native fish. Of 60 ponds visited and assessed with Gee minnow traps or other capture gear, 19 ponds (32%) supported at least one non-native species. Eight of those ponds (13%) supported exclusively non-native species. Sixteen ponds (27%) supported only native species and 27 ponds (45%) yielded no fish during the assessment. Of 3 ponds previously known to support threespine sticklebacks, one yielded this non-native species in 2007. Most (17/25, 68%) SWMPs built before 1995 supported native or non-native fish or a blend of both. Analysis of the rate of colonisation suggested new (<5 years old) ponds were typically colonised by non-native species; however, over time fish communities shifted to native species only or a blend of native and non-native species. Many SWMPs supporting non-native goldfish were located in residential subdivisions and deliberate transfer of goldfish from backyard ponds or aquaria by residents is suspected. Further discussion with the City of Edmonton concerning potential for escapement and control of non-native fish is recommended.

NOTES:

THE END

DRIVE SAFE

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