

**POPULATION GENETICS OF LAKE STURGEON IN ONTARIO,
MANITOBA AND SASKATCHEWAN**

NEW MICROSATELLITE MARKERS 2002, PROGRESS REPORT

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INTRODUCTION

This progress report details ongoing efforts to genetically characterize Canadian lake sturgeon populations using microsatellite DNA. Five additional microsatellite loci have been implemented in this study (Table 1) in addition to the 3 microsatellite markers that have already been used to differentiate between lake sturgeon populations in Manitoba, Ontario, and Saskatchewan . The addition of these five recently developed loci into the suite of microsatellite markers will extend their statistical power and resolution for future analyses of populations among and within rivers in these areas.

POPULATION SAMPLES & PRELIMINARY RESULTS

Saskatchewan Environment has previously provided biological tissue samples from individual lake sturgeon throughout the Saskatchewan River, Saskatchewan (Table 2). These were collected from known locations, labeled to identify individual fish, preserved in ethanol and shipped. From these collections, those populations with the largest sample sizes (Centre Angling: n=50, and Saskatchewan River Forks: n=40) were chosen as candidates for further genetic analysis.

All five loci tested were found to be polymorphic in population samples from both Saskatchewan River sampling locations (Table 3), with the number of alleles per locus varying between 2 (AFU G56) and 7 (AFU G122). The incorporation of this data into a larger dataset of Canadian lake sturgeon populations (including samples from populations in Ontario and Manitoba) is ongoing pending the completion of statistical testing of the larger dataset.

Table 1: Lake sturgeon microsatellite loci.

Locus Name	Primer Sequence (5' to 3')
Afu G9	F: CAT AAT GTA AAG CAA AAG T R: ACC TGA AAT GTA TGT TAT G
Afu G56	F: ACT AAA CCC AGC ACA GAA AAT CAG R: GAA GCC CAT CCC ACA GGT T
Afu G74	F: CTA CAA AGA CGG GTT ACG R: AGC GAC TGT CTG GTT TTC
Afu G112	F: TAT TGT TCC TTT ATG GTT ATG R: TAT TTC ACT GTC TGT TGT ATG TA
Afu G122	F: AAC ACG ACA ACA AAC TTA TTC A R: TGT GTT TCT ATG TCT GTC TGT CTA

Table 2: Summary of lake sturgeon (*Acipenser fulvescens*) tissue collections from spring and summer 2000 field seasons in Saskatchewan.

Collection Location	N	Collection Date
Saskatchewan River - Bigstone Rapids	26	May-Aug 2000
Saskatchewan River - Centre Angling	50	June 2000
Saskatchewan River - Torch River	14	Summer 2000
Saskatchewan River - The Forks	40	May-Sept 2000

Table 3: Genetic characteristics of microsatellite loci analyzed in adult lake sturgeon from the Saskatchewan River, Saskatchewan. N_{FISH} refers to the number of fish analyzed per locus per population. H_{OBS} and H_{EXP} refer to the observed and expected frequencies of heterozygotes.

Locus & Characteristic	Populations Sampled (Saskatchewan River)		Totals
	Centre Angling	Saskatchewan River Forks	
AFU G9			
N_{FISH}	50	40	90
N_{ALLELES}	4	4	
H_{OBS}	0.570	0.350	
H_{EXP}	0.418	0.300	
AFU G56			
N_{FISH}	50	40	90
N_{ALLELES}	2	2	
H_{OBS}	0.320	0.275	
H_{EXP}	0.272	0.240	

Table 3: (continued)

Locus & Characteristic	Populations Sampled (Saskatchewan River)		Totals
AFU G74			
N _{FISH}	50	40	90
N _{ALLELES}	4	3	
H _{OBS}	0.900	1.000	
H _{EXP}	0.544	0.562	
AFU G112			
N _{FISH}	50	40	90
N _{ALLELES}	4	4	
H _{OBS}	0.960	0.825	
H _{EXP}	0.640	0.574	
AFU G122			
N _{FISH}	50	40	90
N _{ALLELES}	7	7	
H _{OBS}	0.980	0.850	
H _{EXP}	0.678	0.608	
MEAN H_{OBS}	0.746	0.660	
MEAN H_{EXP}	0.510	0.457	

REFERENCES

Robinson, M. and M. Ferguson. 2001. Lake sturgeon population genetics in the Saskatchewan and Winnipeg Rivers. MS Report to Manitoba Conservation and Saskatchewan Environment and Resource Management, 13 p.