DISTRIBUTION OF HYBRID NORTHERN REDBELLY DACE (*Phoxinus eos*) X FINESCALE DACE (*Phoxinus neogaeus*) IN THE MUSSELSHELL RIVER DRAINAGE BETWEEN LAVINA AND HARLOWTON

Montana Department of Fish, Wildlife and Parks
2300 Lake Elmo Drive
Billings, MT 59105

Funding provided by
Altamont Gas Transportation Project

INTRODUCTION

This report presents the result of a study conducted by the Montana Department of Fish, Wildlife and Parks (DFWP) to determine the presence of the northern redbelly dace X finescale dace hybrid in the Musselshell River and it's tributaries, in the reach from Harlowton to Lavina, for the purpose of evaluating the potential impacts of a proposed natural gas pipeline crossing. The results of this study will be used by the state of Montana in making recommendations to FERC concerning this pipeline project.

The northern redbelly dace (Phoxinus eos) X finescale dace (Phoxinus neogaeus) hybrid is a unique species in that nearly all specimens collected are females, they are usually found in the presence of only one parent species, and they are apparently a product of clonal or parthenogenetic reproduction (Dawley, Schultz and Goddard 1987). Northern redbelly dace are fairly common in Montana, but finescale dace have never been collected in the state (Holton 1990). Due to the uniqueness of this hybrid species and it's limited distribution in the state, it was designated as a Species of Special Concern in Montana in 1985.

Ten hybrid specimens of northern redbelly/finescale dace were collected in the Musselshell River between Painted Robe Creek and the Musselshell diversion dam in 1985 (Fredenberg 1986). This study was conducted to determine the presence of this hybrid in other streams in the general vicinity of the proposed Altamont pipeline.

METHODS

Fish samples were collected from 26 different sites in the Musselshell River drainage upstream of Lavina between August 9 and August 23, 1991. Samples were collected from five sites on the Musselshell River and from 11 tributaries to the Musselshell (Appendix A). Several other sites were investigated but found to be dry or contain very little water and no fish.

Sampling was conducted using minnow traps, seines, dip nets and through visual observation. Representatives of all species collected at each site were preserved in 10% formalin and returned to the lab for positive identification. All samples were keyed to species by regional fisheries personnel. Any specimen where identification was questionable, and all fish of the genus Phoxinus were sent to Dr. Bill Gould in Bozeman for positive identification.

RESULTS AND DISCUSSION

Eleven fish species were collected during this study including eight members of the minnow family (Cyprinidae), two members of the sucker family (Catostomidae) and one member of the catfish family (Ictaluridae) (Table 1).

Table 1. Fish species collected from the Musselshell River and its tributaries between Lavina and Harlowton, August 9 - 23, 1992.

Brassy minnow	(*Hybognathus hankinsoni*)
Carp	(*Cyprinus carpio*)
Fathead minnow	(*Pimephales promelas*)
Flathead chub	(*Hybopsis gracilis*)
Lake chub	(*Couesius plumbeus*)
Longnose dace	(*Rhinichthys cataractae*)
Northern redbelly dace	(*Phoxinus eos*)
Northern redbelly/finescale dace hybrid	(*P. eos* x *P. neogaeus*)
Mountain sucker	(*Catostomus platyrhynchus*)
White sucker	(*Catostomus commersoni*)
Stonecat	(*Noturus flavus*)

Northern redbelly/finescale dace hybrids were positively identified in one sample collected from the South Fork of Big Coulee Creek (Table 2). A second sample collected in Big Coulee Creek contained one specimen exhibiting some characteristics of the hybrid, but could not be positively identified. Appendix B presents the results of the taxonomy work conducted by Dr. Gould.

Northern redbelly dace were collected at five sites: two on Big Coulee Creek, one on the South Fork of Big Coulee Creek where the hybrids were found, one on Fish Creek, and one on the Musselshell River at Shawmut. Because hybrids are usually found with this parent species, and since hybrids are present in the drainage, it is likely that additional hybrids would be found at these other sites with more intense sampling.

Sites on the South Fork and on Big Coulee Creek where the redbelly/finescale hybrids and the unconfirmed dace were collected were both within a mile of the proposed pipeline crossing. The sites on Fish Creek and the Musselshell River where northern redbelly dace were collected were within the proposed pipeline route. The second site on Big Coulee Creek was about six miles downstream of the proposed route.

In summary, northern redbelly/finescale dace hybrids have been collected in the upper Big Coulee Creek drainage and in the Musselshell River from Painted Robe Creek downstream. The northern redbelly dace parent has been documented at several additional sites in this section of the Musselshell drainage, indicating the hybrid may be even more widely distributed than determined by our limited sampling. Based on these results, the DFWP expects to require special considerations as part of the permitting process when planning the pipeline construction through this area. Anticipated requirements would be that all stream crossings be planned to avoid known populations of hybrids, that construction be limited to times when stream flows are at a minimum, and that crossing should be planned to minimize turbidity and time spent in the stream.

Table 2. Summary of fish collected by sampling site for 26 sites sampled in the Musselshell River Drainage between Lavina and Harlowton, August 9 - 23, 1992.

* Location	Site No.	Brassy Minnow	Carp	Fat-head Minnow	Flat-head chub	Lake Chub	Long-nose Dace	N. Red-belly Dace	Redbelly x Finescale Hybrid	Mountain Sucker	White Sucker	Stone-cat
N. Valley Creek	1					X				X		
Valley Creek	2			X		X	X			X	X	
Valley Creek	3					X	X					
Middle Creek	4					X						
Cedar Creek	5					X						
Canyon Creek	6					X						
Cedar Creek	7					X						
Six Shooter Creek	8					X						
S. Fk Big Coulee Cr	9			X		X		X	X			
S. Fk Big Coulee Cr	10			X		X	X					
Weppler Ranch Pond	11			X		X					X	
Big Coulee Creek	12			X		X	X	X	See Appendix B			
Fish Creek	13			X	X	X	X	X			X	
Musselshell River	14	X	X	X		X				X	X	
Musselshell River	15				X							X
Musselshell River	16				X	X						
Musselshell River	17		X		X	X	X				X	
Fish Creek	18				X	X	X					
Fish Creek	19				X		X					
Big Coulee Creek	20	X		X		X	X	X				
Big Coulee Creek	21			X		X	X					
Musselshell River	22	X		X		X	X	X			X	X
Roberts Creek	23			X		X						
Timber Creek	24			X		X					X	
Galloway Creek	25					X						
Roberts Creek	26					X	X				X	

* Legal descriptions given in Appendix A.

LITERATURE CITED

Dawley, R.M., R.J. Schultz and K.A. Goddard. 1987. Clonal reproduction and polyploidy in unisexual hybrids of Phoxinus eos and Phoxinus neogaeus. Copeia 1987(2). pp.275-283

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Holton, G.D. 1990. A Field Guide To Montana Fishes. Montana Department of Fish, Wildlife and Parks.

Prepared by: Kenneth J. Frazer

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APPENDIX A

MUSSELSHELL RIVER DRAINAGE MINNOW SAMPLING LOCATIONS

MUSSELSHELL RIVER DRAINAGE MINNOW SAMPLING LOCATIONS

1. North Valley Cr
   T1S R22 Sec. 22 BC
2. Valley Cr
   T1S R22E Sec. 27 CB
3. Valley Cr
   T1S R22 Sec. 22 BC
4. Middle Cr
   T2N R20E Sec. 2 CC
5. Cedar Cr
   T2N R20E Sec. 12 AD
6. Canyon Cr
   T1N R22E Sec. 15 CD
7. Cedar Cr
   T2N R19E Sec. 2 DA
8. Six Shooter Cr
   T2N R20E Sec. 4 BB
9. South Fork Big Coulee Cr
   T4N R19E Sec. 18 DC
10. South Fork Big Coulee Cr
    T4N R19E Sec. 18 DC
11. Weppler Ranch Pond
    T4N R19E Sec. 7 DB
12. Big Coulee Cr
    T4N R19E Sec. 5 DD
13. Fish Cr
    T6N R18E Sec. 24 CC
14. Musselshell River
    T6N R21E Sec. 2 CA
15. Musselshell River
    T6N R21E Sec. 2 CA
16. Musselshell River
    T6N R20E Sec. 5SW¼ Sec. 6SE¼
17. Musselshell River
    T6N R19E Sec. 6 AD
18. Fish Cr
    T6N R19 NE Sec. 19 AD
19. Fish Cr
    T6N R18E Sec. 24 CC
20. Big Coulee Cr
    T5N R19E Sec. 25SE¼ Sec. 26NE¼
21. Big Coulee Cr
    T5N R20E Sec. 17 SW¼ Sec. 18 SE¼
22. Musselshell River
    T7N R18E Sec. 30 CB
23. Roberts Cr
    T8N R18E Sec. 17 CA
24. Timber Cr
    T9N R17E Sec. 28 AA
25. Galloway Cr
    T9N R17E Sec. 29 BA
26. Roberts Cr
    T9N R17E Sec. 31 AA

APPENDIX B

IDENTIFICATION OF SELECTED MINNOWS COLLECTED FROM SITES IN THE MUSSELSHELL RIVER DRAINAGE ALONG THE PROPOSED ALTAMONT PIPELINE ROUTE

Montana State University
Bozeman, Montana 59717-0001

Department of Biology
College of Letters and Science

Telephone (406) 994-4548

February 10, 1992

Jim Darling
Mt. Dept. Fish, Wildlife & Parks
1125 Lake Elmo Drive
Billings, MT 59105

Dear Jim:

Here are my identifications of fish in the collections you recently sent. All were collected by G. Cooper and M. Fliger.

Collection Number	Location	Date	Species
3	Valley Creek T1S R22E S22	8/9/91	Couesius plumbeus
9	South Fork Big Coulee Creek T4N R19E S18	8/12/91	Phoxinus eos Phoxinus eos X P. neogaeus Rhinichthys cataractae Phimephales promelas Couesius plumbeus
12	Big Coulee Creek T4N R19E S5	8/15/91	Phoxinus eos ????
13	Fish Creek T6N R18E S24	8/15/91	Phoxinus eos
14	Musselshell River T6N R21E S2	8/19/91	Hybognathus hankinsoni
20	Big Coulee Creek T5N R19E S25, 26	8/23/91	Phoxinus eos Hybognathus hankinsoni
22	Musselshell River T7N R18E S30	8/23/91	Phoxinus eos Hybognathus hankinsoni

Collection number 12, Big Coulee Creek, T4N R19E S5, contained one specimen that seemed to be a P. eos X P. neogaeus by one feature but did not show a confirming feature. This site might contain these hybrids so if you have the chance, sample there again.

Regards,

Bill

William R. Gould
Emeritus Professor of Fisheries Management