DISTRIBUTION OF HYBRID NORTHERN REDBELLY DAGE (<u>Phoxinus eos</u>) X FINESCALE DACE (<u>Phoxinus neogaeus</u>) IN THE MUSSELSHELL RIVER DRAINAGE BETWEEN LAVINA AND HARLOWTON

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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 (<u>Phoxinus eos</u>) X finescale dace (<u>Phoxinus neogaeus</u>) 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 <u>Phoxinus</u> 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
Carp
Fathead minnow
Flathead chub
Lake chub
Longnose dace
Northern redbelly dace
Northern redbelly/finescale dace hybrid
Mountain sucker
White sucker
Stonecat

(Hybognathus hankinsoni)
(Cyprinus carpio)
(Pimephales promelas)
(Hybopsis gracilis)
(Couesius plumbeus)
(Rhinichthys cataractae)
(Phoxinus eos)
(P. eos x P. neogaeus)
(Catostomus platyrhynchus)
(Catostomus commersoni)
(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.

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^{*} 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 <u>Phoxinus eos</u> and <u>Phoxinus neogaeus</u>. Copeia 1987(2). pp.275-283

Fredenberg, W. 1986. South Central Montana Fisheries Investigations, Musselshell River Study. Montana Dept. Fish, Wildlife and Parks Job Progress Report. F-20-R-30, Job III-a.

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

Prepared by: Kenneth J. Frazer

Date: March 1992

APPENDIX A

MUSSELSHELL RIVER DRAINAGE MINNOW SAMPLING LOCATIONS

MUSSELSHELL RIVER DRAINAGE MINNOW SAMPLING LOCATIONS

- North Valley Cr T1S R22 Sec. 22 BC
- 3. Valley Cr TIS R22 Sec. 22 BC
- 5. Cedar Cr T2N R2OE Sec. 12 AD
- 7. Gedar Gr T2N R19E Sec. 2 DA
- 9. South Fork Big Coulee Cr T4N R19E Sec. 18 DC
- 11. Weppler Ranch Pond T4N R19E Sec. 7 DB
- 13. Fish Cr T6N R18E Sec. 24 CC
- 15. Musselshell River T6N R21E Sec. 2 CA
- 17. Musselshell River T6N R19E Sec. 6 AD
- 19. Fish Cr
 T6N R18E Sec. 24 CC
- 21. Big Coulee Cr T5N R20E Sec. 17 SW4 Sec. 18 SE4
- 23. Roberts Cr T8N R18E Sec. 17 CA
- 25. Galloway Cr T9N R17E Sec. 29 BA

- 2. Valley Cr T1S R22E Sec. 27 CB
- 4. Middle Cr T2N R2OE Sec. 2 CC
- 6. Canyon Cr T1N R22E Sec. 15 CD
- 8. Six Shooter Gr T2N R2OE Sec. 4 BB
- 10. South Fork Big Coulee Cr T4N R19E Sec. 18 DC
- 12. Big Coulee Cr T4N R19E Sec. 5 DD
- 14. Musselshell River T6N R21E Sec. 2 CA
- 16. Musselshell River
 T6N R20E Sec. 5SW% Sec. 6SE%
- 18. Fish Cr T6N R19 NE Sec. 19 AD
- 20. Big Coulee Cr T5N R19E Sec. 25SE% Sec. 26NE%
- 22. Musselshell River T7N R18E Sec. 30 CB
- 24. Timber Cr T9N R17E Sec. 28 AA
- 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



Department of Biology

Telephone (406) 994-4548

College of Letters and Science
Jim Darling

February 10, 1992

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	<u>Date</u>	<u>Species</u>
3	Valley Creek T1S R22E S22	8/9/91	Coužsius 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	<u>Phoxinus eos</u> <u>Hybognathus</u> <u>hankinsoni</u>
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 \underline{P} . \underline{eos} X \underline{P} . $\underline{neogaeus}$ 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.

William R. Gould

Emeritus Professor of Fisheries Management