

Texas Parks & Wildlife Department  
**OFFICE MEMORANDUM**

TO: Dave Terre

FROM: Beverly Villarreal

SUBJECT: Results of Fatty Acid Profile Analysis  
 for Rainbow Trout

RE: Guadalupe River population origin

DATE: 16 Sept 96

COORDINATION - ROUTING			
DIV.	NAME	INITIAL	DATE
DF	Steve Terre	ST	9-18-96
	<del>Steve Terre</del>		
	Steve		
REMARKS: Results of fat tests. please file w/ RBT STAFF			
RETURN TO: THX D.			

Three groups of fish were analyzed for fatty acids to determine if rainbow trout young-of-the-year caught in the Guadalupe River were stocked or reproduced in the river. Five fish captured from the Guadalupe River, four fish from a raceway at A.E. Wood, and 45+ fish from Possum Kingdom hatchery were included in the analysis; results were compared with information from the literature. Fish from the Guadalupe River and the Possum Kingdom hatchery were of comparable size (7.0 to 12.5 cm T.L.). The A.E. Wood fish were larger (15.5 to 20.0 cm T.L.).

The paper used for the comparison described fatty acid profiles of 3 wild and 3 farm-raised rainbow trout in Japan. The wild trout were 3-4 years old and the cultured trout were 3 years old. The paper stated that the rainbow trout from the wild had never been fed artificial feed. The researchers found that the wild trout contained significantly less 18:2n-6 and 22:6n-3 and significantly more 18:3n-3 than the farmed trout. The same type of pattern is seen in the trout analyzed from the Guadalupe River (Table 1).

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Table 1. Rainbow trout were compared by three diagnostic fatty acids to determine the likely origin of the rainbow trout captured from the Guadalupe River. The Guadalupe River trout were most similar to the wild rainbow trout captured from Japanese rivers and described by Suzuki et al. (1986)<sup>1</sup>. Values are weight% fatty acid (mean±SD).

	18:2n-6	18:3n-3	22:6n-3
Guadalupe River	2.61	4.44	7.15
	3.92	7.23	6.58
	3.48	4.53	18.41
	5.08	8.25	10.05
	4.76	9.65	10.86
Summary Statistics, n=5	3.97±0.99	6.82±2.30	10.61±4.73
Japanese, Wild, n=3	4.9±1.3	6.9±1.6	11.7±1.9
Japanese, Farmed, n=3	10.1±0.3	0.9±0.1	25.8±1.9
Possum Kingdom, Farmed, n=45	9.14±0.74	1.32±0.13	16.73±3.57
A.E. Wood, Farmed, n=4	7.09±1.23	1.49±0.45	19.98±3.01

A confounding factor to the conclusions that could be drawn from these results is that Pat Hutson has knowledge that Trout Unlimited has released eggs in the river and apparently they were successfully hatched. How frequently it occurred and when it last occurred, I do not know. Probably the fatty acids of fingerlings that came from those eggs would resemble the fatty acids of fingerlings that were produced in the river.

If you have any questions or need further assistance, please call.



1

Suzuki, H., K. Okazaki, S. Hayakawa, S. Wada, and S. Tamura. 1986. Influence of commercial dietary fatty acids on polyunsaturated fatty acids of cultured freshwater fish and comparison with those of wild fish of the same species. *J. Agric. Food Chem.* 34:58-60.