

INFLUENCES OF THE LONGNOSE SUCKER ON THE EARLY
LIFE STAGES OF CUTTHROAT TROUT IN TRIBUTARIES
OF YELLOWSTONE LAKE,
YELLOWSTONE NATIONAL PARK, WYOMING

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Purpose

The purpose of this study was to determine what, if any, influences the longnose sucker (Catostomus catostomus) have upon the cutthroat trout (Salmo clarki) population with special reference to early life stage interactions. The specific objective of this investigation was to determine if the introduced sucker was having a deleterious effect upon the growth and survival of indigenous trout fry.

Cutthroat trout and longnose suckers use tributaries of Yellowstone Lake as spawning areas and the potential for intraspecific competition between fry of both species is considerable. The maintenance of an ecologically sound population of cutthroat trout in Yellowstone Park is a prerequisite to the National Park Service policy of maintaining native flora and fauna in national parks.

Procedures

Determination of streams in the study area containing both spawning species was accomplished on foot and by the use of a boat.

Direct competition for spawning sites and the ingestion of salmonid eggs by suckers was determined by streamside observations and the collection and examination of stomachs taken from spawning suckers.

Hatching times and territorial behavior were monitored and recorded.

Intensive gill-netting, using fine mesh nets, was attempted in order to define territorial behavior of yearling suckers and trout. In addition to the gill netting a beach seine was used to qualify and quantify nursery areas of the suckers and trout.

Data (length, weight, sex) were collected as well as scales, opercles, fin rays, and otoliths for determination and comparison of growth rates during fry and fingerling stages.

Results

Determination of spawning sites used by the two species resulted in the

inclusion of four additional tributaries previously unknown. These were: 1) Solution Creek; 2) Little Thumb Creek; 3) Thumb Creek; and 4) an unnamed creek located on the west shore of Bridge Bay.

Observations into the behavior of the two spawning populations revealed no direct competition for spawning sites. No aggressive behavior was noted between the two species which at times were intermingled over spawning sites. However, suckers for the most part were found in the deep pools of the tributaries while trout were more often found in the riffle areas. Male trout occasionally demonstrated aggressive behavior (nipping, chasing, etc.) towards other males but this was not always the case.

Examination of 46 suckers revealed no ingestion of salmonid eggs in Arnica Creek.

Cutthroat trout and longnose sucker fry were first observed on July 15, 1978, in Arnica Creek. Trout fry were observed to be feeding on surface drift. Sucker fry appeared not to be feeding but due to their extreme small size (approx. 1.2 cm) this observation is subject to error. Sucker fry were observed in back water pools and along the stream bank where water velocities were minimal. Trout fry were found throughout the stream as their relatively large size (2.6 cm) probably allowed maintenance of position in the stream. Aggressive behavior was noted on a few occasions. Trout fry were observed to chase sucker fry but on no occasion were they successful in capturing the sucker.

On August 1, 1978, observations failed to reveal any sucker fry in Arnica Creek. It is hypothesized that the fry migrated passively downstream due to their inability to maintain position in the stream. Trout fry were still numerous in Arnica Creek.

Gill netting results (Table 1) suggest a certain degree of separation of habitat of the cutthroat trout and longnose sucker. Numerical dominance of one species was usually evident. This separation undoubtedly reduces competition between the species.

Beach seining revealed the total absence of trout fry from the littoral areas of the lake. Yearling and two-year-old longnose suckers were present in most lagoons. It is not known now whether absence of trout in the lagoons is the result of competition with suckers and reidside shiners or whether the cutthroat trout fry normally move directly from the streams to the pelagic areas of the lake.

Although preliminary, results indicate normal growth rates for longnose suckers in Yellowstone Lake. Work is still progressing at this time concerning the longevity of the suckers.

Conclusions

The data presented in this report seem to indicate a minimal effect on the cutthroat trout fry by the longnose sucker. However, certain phenomena (i.e., causative agents of fry migration, feeding relationships, and trout nursery areas) have yet to be examined and explained. These phenomena may have a tremendous effect upon the cutthroat trout population in Yellowstone Lake and warrant further investigation.

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Table 1. Gillnetting Results

Set No.	Location	Hours Set	Cutthroat	Suckers
1	Steamboat	14.25	20	11
2	Holmes Pt.	14.75	12	5
3	Little Thumb Ck.	13.83	2	3
4	Little Thumb Ck. II	14.25	2	6
5	Clear Ck.	16.5	13	4
6	Cub Ck.	16.5	33	4
7	Bridge Bay I	11.75	11	13
8	Bridge Bay II	12.0	7	19
9	Mary Bay I	15.5	10	0
10	Mary Bay II	15.5	7	5
11	Mary Bay III	15.5	5	2
12	Sedge Bay I	15.25	17	8
13	Sedge Bay II	15.25	14	13
14	Sedge Bay III	15.25	20	5
15	Pelican Ck.	20.75	4	0
16	Lake Ranger St.	21.50	3	7
17	Sand Pt.	18.50	4	1
18	Gull Pt.	18.50	1	11
19	Thumb Ck.	14.00	15	1
20	Grant Marina/Solution Ck.	14.00	14	0