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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 redside
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.
Acknowledgments

I wish to thank personnel of the U.S. Fish and Wildlife Service for their invaluable assistance throughout this study. I also wish to thank Dr. Kenneth Diem, Director of the University of Wyoming-National Park Service Research Center. This study was supported through a grant from the University of Wyoming-National Park Service Research Center.

Table 1. Gillnetting Results

<table>
<thead>
<tr>
<th>Set No.</th>
<th>Location</th>
<th>Hours Set</th>
<th>Cutthroat</th>
<th>Suckers</th>
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<tr>
<td>1</td>
<td>Steamboat</td>
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<td>20</td>
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<td>Holmes Pt.</td>
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<td>3</td>
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<td>Little Thumb Ck. II</td>
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<td>2</td>
<td>6</td>
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<td>Clear Ck.</td>
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<td>4</td>
</tr>
<tr>
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<td>Cub Ck.</td>
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<td>33</td>
<td>4</td>
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<td>Bridge Bay I</td>
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<td>13</td>
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<td>Mary Bay II</td>
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<td>7</td>
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<td>Sand Pt.</td>
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