

Date: 4/22/82Red River 101-30-070FISHERIES REHABILITATION AND/OR ENHANCEMENT
NEW PROJECT OPPORTUNITY FORM*

1. WHAT (give a brief description): A large falls consisting of two major steps, each about 16 feet in height. These falls occur in a narrow canyon and flow over bedrock. Both falls are inclined drops into deep pools. Smaller cascades and falls occur downstream of these major falls. The falls can be assumed to be a total barrier to all anadromous fish.
2. WHERE (be specific): The major falls site is located approx. 3/4 mile upstream from tide water on Red River. Red River is tributary to Marten Arm, Boca de Quadra.
3. BENEFITS: Correction of the barrier falls would access an estimated 56 acres of stream habitat and 120 Acres of lake area. Potentially, all anadromous species could utilize this habitat. The potential project costs could be high but also the potential benefits are also high.
4. SUBMITTED BY (name, address, telephone, etc.):
Mike Pease Fisheries Biologist
U.S. Forest Service
Ketchikan Alaska 99901 907-225-3101

Distribute this form to the following persons:

1. Your Supervisor

2. Regional Supervisor(s)
Appropriate ADF&G Office
a. Commercial Fisheries
b. Sport Fisheries
c. F.R.E.D.
d. Habitat SectionRegional Office
210 Ferry Way
Juneau, AK 99801
or
Regional Office
333 Raspberry Rd.
Anchorage, AK 995023. Director of Fisheries & Wildlife
USDA Forest Service
Box 1628
Juneau, AK 998024. Program Manager Fish & Wildlife
(Appropriate Forest Service)a. Stikine Area
Tongass National Forest
P.O. Box 309
Petersburg, AK 99833
b. Chugach Area
Chugach National Forest
Pouch 6606
Anchorage, AK 99502
c. Ketchikan Area
Tongass National Forest
Federal Building
Ketchikan, AK 99901
d. Chatham Area
Tongass National Forest
P.O. Box 1980
Sitka, AK 99835

* This form is to be used by Fish & Game and Forest Service personnel to identify opportunities that may be worthy to pursue to help rehabilitate and/or enhance the fisheries. Use of this form is not limited to these agencies as all persons are encouraged to help identify opportunities. Use of this form will inform the agencies that have responsibility for projects. This form is not intended to be a proposal. Development of a Project Proposal would be in subsequent documents.

PORTIAL FISHWAY VERIFICATION FORM

Name: Red River ADF&G Cat. No.: 101-30-070
 Latitude: _____ USFS Cat. No.: _____
 Longitude: _____ Date: 4/22/82
 Geodetic Map No.: Ketchikan A-2 Surveyed by: _____
 Location: Marten Arm, Boca de Quadra
 Aerial Survey Notes: Easily observed from aircraft for upstream habitat. Falls are in a canyon and difficult to observe - low level photos taken in 1981
 Trails: None

Ladder will primarily accommodate: Potentially all anadromous fish

AVAILABLE ESCAPEMENT DATA:

Year	Pink	Chum	Coho	Sockeye	King	Steelhead
1968	2500					
1966	--- 1500 ---		in JTB			
1957		100				
1966	250					
1947	2	25				
1928	12000	3000				

Suitable habitat is lacking below falls and as such, the Red River is not usually surveyed for annual escapement.

Other species present: unknown for coho, kings, and steelhead

TIMING: _____

ESTIMATED SPAWNING AREA:

- 1) Below Barrier: _____ How Surveyed: _____
 - 2) Above Barrier: _____ How Surveyed: _____
- No distinction available between spawning + rearing habitat.

REARING AREA:

- 1) Below Ladder: _____ How Surveyed: _____
- 2) Above Ladder: 36 Ac. Stream How Surveyed: 1991 map estimates
120 Ac. Lake

DRAINAGE AREA:

DISCHARGE: Contains many years of U.S.G.S. Stream gauge data
 GRADIENT: Very gentle above falls
 SURVEY OF BARRIER: Measured at 32.5 feet in 2 falls
 SKETCH MAP OF ENTIRE SYSTEM: _____
 PHOTOGRAPHS: _____

DISTANCE OF LADDER SITE FROM SALT WATER: Approx 3/4 miles
 DISTANCE OF LADDER SITE FROM NEAREST ROAD: _____

ENGINEERING CRITERIA:

- 1) Ladder Type: Potentially a very major designed and reinforced structure.
- 2) Etc.: _____

CHECK LIST (these should be in letter form to USFS)

COMMERCIAL FISH MANAGEMENT COMMENTS:

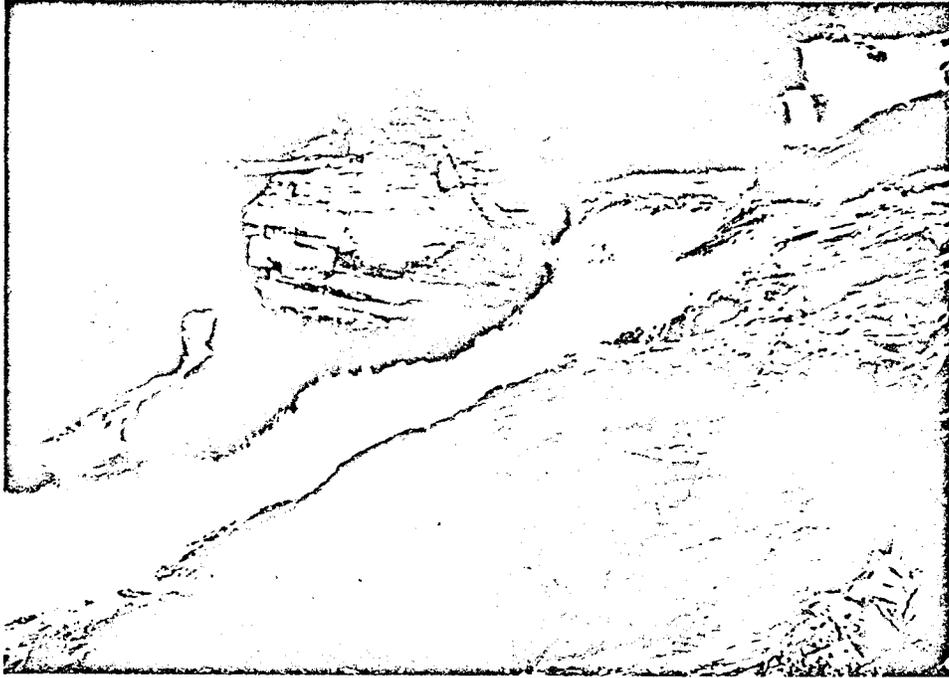
SPORT FISH MANAGEMENT COMMENTS:

HABITAT PROTECTION COMMENTS:

COST ESTIMATE OF PROJECT:

REMARKS: Based on observations of the potentially available habitat, fish production estimates, and the potential complexity of developing a fish passage structure, the Red River appears to have a favorable enhancement potential, or at least warrants more detailed analysis. The potential costs are great but so are the potential enhancement benefits.

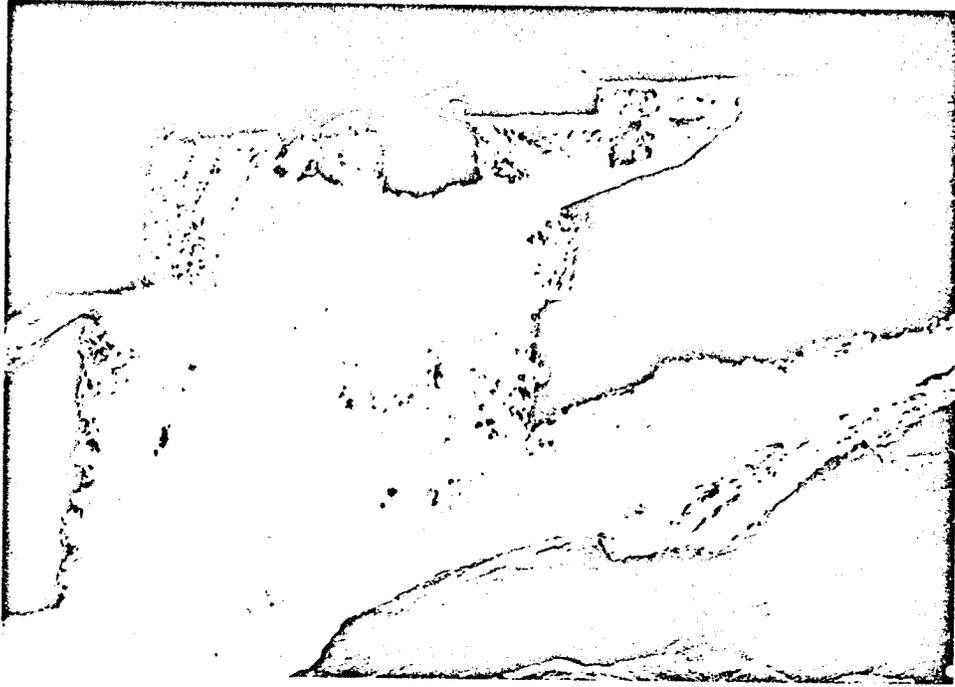
The Red River watershed is classified as an Ecological Natural Area. A determination must be made as to allowable activities in such an area.



Red River Falls 1951



Stream Below falls



Red River Falls 1981
TOP OF UPPER



Pool between steps in falls



Reply to: 2620 Planning

Date: November 25, 1981

Subject: Red River Falls Preliminary Site Assessment

To: Fish Enhancement Program File

On July 31, 1981, Mike Pease and myself visited a barrier to fish passage on the Red River, which flows into the Marten Arm of Boca De Quadra. The purpose of the trip was to assess the extent of the barrier, the feasibility of a project to mitigate the barrier, and to photograph the site.

Access to the site was via a seaplane to the float at Wilson Arm, followed by a helicopter to the stream bed above the falls.

The water level at the time of our visit was low. There had been no significant rainfall for the previous three or four weeks.

The falls can be described as two-tiered, with an intermediate pool. The lower falls shoots around a large boulder, over bedrock, through an elevation drop of approximately 16 feet. The upper falls is more vertical. It flows over bedrock through a vertical drop of approximately 12.5 feet. The estimated length of the intermediate pool is 50 feet. The total height of the barrier is 32.5 feet.

The stream channel is bedrock, with near vertical walls on the right side. The left side is less steep, with extremely irregular bedrock topography (see photos). A shear plane runs longitudinally up the left side of the channel. The bedrock is highly fractured and orange-red in color, interspersed with a gray-quartz veined material. Above and below the falls are consecutive minor falls and riffles.

The falls appeared to be a total barrier to all species of anadromous fish at all flows. The combined height and overall steepness of the reach, coupled with the irregular bedrock topography, presents a formidable fish passage problem. A solution will likely be expensive, and may be difficult to justify.



It is doubtful that a fishway structure, utilizing the existing stream channel, could be designed to provide the required lift for effective fish passage. The reach of stream is too steep and short, which would require the structure to be of an extremely compressed design. A feasible, if not uneconomical, design, would thus probably require some stream channel modification to reduce the effective gradient of the reach. One approach might be to excavate a tunnel through the bedrock from the intermediate pool to above the upper falls. A modeling study of the site would be necessary to effect a prudent design.

At the time of our visit, no fish were observed below the falls. This was not surprising, because there is little available spawning habitat below the falls. The extent of existing anadromous fish stocks is dubious. The system merits further study, however, because the reach upstream appears to be particularly rich in suitable spawning habitat. If it appears possible to enhance stocks of relatively strong swimming fish, such as coho and chinook salmon, by artificial propagation, it may be prudent to study the alternative of falls modification by controlled blasting, coupled with some structural work. The presence of a lake in the system may provide the additional opportunity to establish a run of sockeye salmon.

In summary, the falls appear to be a total barrier to all species of anadromous fish at all flows. It is likely that mitigation of the barrier by a conventional fish passage structure would be extremely expensive, technically difficult, and hard to justify. Since the system appears to be particularly rich in suitable spawning habitat, a study to assess the biological potential of the drainage should be undertaken. If the conclusions of this study are sufficiently attractive, it may be prudent to model the site. A program of stock enhancement by artificial propagation, coupled with falls mitigation by controlled blasting and structural work, may be a viable fish passage strategy.

BOB AASERUDE
Civil Engineer

Red River - Project Verification

On July 31, 1981, Bob Aaserude and Mike Pease traveled to the Red River (101-30-070) near the head end of Martin Arm in Boca de Quadra.

Approximately three-quarters of a mile upstream of the intertidal area, a major barrier site was examined. This barrier is considered to be a total barrier to the upstream migration of all anadromous fish species.

The barrier falls on the Red River consists of two distinct steps and two large pools. The lower most step is a 16 foot drop that cascades down over an inclined rock surface. This cascade occurs in a horizontal distance of approximately 25 feet, and drops into a deep pool. The depth at this pool is estimated to be at least 8 feet. In the area of the right side of this step, looking down stream, an accumulation of boulders appears to provide the cause of this lower step.

Between the two steps of this barrier falls, an intermediate pool exists. This pool is estimated to be approximately 60 feet in length and 20 feet across. The depth of this pool is at least 10 feet. The occurrence of reasonably clear water made such observations possible. Effective probing of this pool could not be done. A large area of turbulent white water exists at the upper end of this pool.

The upper step of this site was measured at 16.5 feet in height. This step is a combination of a vertical drop and an inclined chute. The stream channel area immediately above this upper step is of bedrock with many small pools, jumps and inclined chutes. With about 100 feet of the top of this site, the stream widens considerably into a bedrock/rubble channel at least 80 feet in width. The channel width at this site varies considerably; an estimated 30 feet at the lower pool to 50-60 feet at the top of the upper pool. Exact measurements of the channel width could not be obtained.

At this date of observation, the stream flow was considered to be moderately low. However, sufficient flow was available to preclude crossing the channel at the site.

This barrier site is located within very rugged terrain. This site occurs at the top end of a narrow rock canyon with all the streambed and streamside substrate consisting of bedrock and large boulders. The bedrock in the immediate falls areas is broken by extensive faulting and jointing. Some variations in rock type were observed with many quartz veins occurring throughout the area.

A thorough foot reconnaissance at the stream channel below this falls was not conducted. Such a survey would be difficult if at all possible. Many other small cascades and falls were observed in this downstream area from a helicopter. Only limited amounts of suitable fish habitat were observed in this lower stream section.

The Red River falls site occurs at a major bend in the stream channel. A large variation in stream discharge is evidenced by the presence of a wide overflow channel immediately adjacent to the barrier falls. This overflow channel occurs at the outside of the channel bend and averages from 20 to 40 feet in width. This channel exposes a multitude of detail regarding the geology of this site.

At the time of observation, no fish were observed in the area. From aerial overflights, several miles of what appears to be highly suitable fish habitat exists in the Red River valley above the barrier falls. No on-the-ground observations were made in these upper stream areas.

The feasibility of correcting the Red River barrier falls will be difficult to determine. In general, it appears that the development of a fish passage facility for this site will be very difficult and expensive. It is envisioned that only a thoroughly designed reinforced concrete and steel structure could achieve an enhancement objective for this system. However, it appears that the potential amount and quality of available fish habitat in the upstream area could possibly justify an enhancement project. The probable enhancement target species of this project would be Coho and Chinook Salmon.

All of the Red River that contains potentially suitable fish habitat has been previously photographed using low-level aerial photography. This photography should be able to provide an estimate of the quantity and distribution of fish habitat and ultimately an estimate of the potential fisheries values of the Red River.

If the potential fisheries values are high, additional site specific feasibility studies should be conducted. Such studies should address the hydrology of the watershed, and the hydraulic, geotechnical, and engineering aspects of the barrier site.

Access to this site is available by helicopter, with a suitable landing area available along the stream above the falls.

P. MICHAEL PEASE
Fisheries Biologist, S.O.

Red River 101-30-070

Approximately 3/4 mile upstream from saltwater, exists major set of falls. These falls are expected to be a total barrier to all salmon.

These falls occur in two major steps or lie at the inside of a stream bend. Looking upstream, the first step of the falls has an estimated 18-20 foot drop over bedrock at an estimated 100% slope. A small side chute occurs around the left side of a massive boulder. It is unknown if this chute is passable to fish. The second step is an estimated 12-15 foot drop over bedrock at about a 60% slope. Between these falls is a small pool with extensive white water at this date. At higher discharges, it is expected that this pool would be lost due to excessive velocities and turbulence. A large pool occurs below the first falls.

Both falls occur in a deep incised canyon with steep bedrock sides. The canyon width is approximately 60-80 feet. Above the falls, the stream opens into a very wide, gentle flowing stream. A suitable helispot exists immediately above these falls.

Approximately midway between these falls and saltwater, there occurs another site that may create a potential fish passage problem. Access by helicopter was not available other than hovering above the site. Several photos were taken here.

This site appears to have a 6 to 8 foot drop between some large boulders. Closer examinations of this site will have to occur by foot surveys from tidewater.

Above the major set of falls on the Red River, occur many miles of what appears to be excellent spawning and rearing habitat for salmon.

To the right of the main falls, the stream channel consists of extensive bedrock areas used by high flows. This area may offer possibilities for a potential fishway design.

The Red River currently has an active U.S.G.C. stream guage near its mouth.

Surveys of these three streams are preliminary at present. However, they all appear to have potential positive benefits for enhancement. The Red River will most likely be a difficult project but the potential benefits appear to be great.

Detailed surveys of all these systems and sites are needed, especially by a hydraulics engineer, design and materials engineer, and biologists. The presence or absence of anadromous fish in these areas above the falls must be determined.

Since these drainages are so large and extensive, the use of aerial photography may be desirable to quantify potential fish habitat.

Access to the lower falls site can be made by helicopter immediately below the falls. An area of difficult but passable rock occurs between this landing site and the falls. This area may not be passable at higher flows, consequently an approach from upstream may be necessary.

Martin River Dicks's Creek

Dick's Creek is the first major tributary to enter the Martin River above saltwater. Approximately three-fourths of a mile above the confluence with the mainstream Martin River, exists a fall with an estimated drop of 8 feet. This falls is approximately 50 feet across. The right one-third of the falls has a 5-6 foot drop with another two foot drop above this. A deep pool exists below this falls and contains considerable amounts of white water.

At this date of survey, an estimated 5,000-8,000 pink salmon were stacked up below this site. Flow levels were considered moderate to low. Extensive observations of fish below this site indicate that pink salmon cannot negotiate these falls. Sufficient flow volumes were available to facilitate passage. Predation by both bears and eagles is heavy at these falls.

The stream below this falls is quite wide with areas of up to about 6% gradient. Substrate below the falls is large well rounded boulders with some interspersed gravel. Above the falls exists several miles of stream that appears to have excellent spawning habitat for pink salmon. Low level helicopter observations of the upstream areas revealed no adult salmon. No foot surveys of this upper area was conducted. It is reasonable to expect that both king and coho salmon would utilize this area at present.

The character and formation of this falls tends to indicate that alterations or laddering around the right side looking upstream would be highly feasible.

Helicopter access to this site is possible immediately below the site at moderate or lesser flows.

Little or no information is available from ADFG on the use of this stream by adult salmon. According to John Valentine, this stream has not been known to be a pink salmon producer.