



State of Alaska
Department of Fish and Game
Division of Sport Fish

Nomination Form
Anadromous Waters Catalog

Region SCN USGS Quad(s) LISTED
 Anadromous Waters Catalog Number of Waterway LISTED
 Name of Waterway LISTED USGS Name Local Name
 Addition Deletion Correction Backup Information

For Office Use

| | | | |
|----------------|---------------------------|----------------------------|----------------|
| Nomination # | <u>10-740</u> | _____ | _____ |
| Revision Year: | <u>2011</u> | Fisheries Scientist | Date |
| Revision to: | Atlas _____ Catalog _____ | Habitat Operations Manager | Date |
| | Both _____ | <i>[Signature]</i> | <u>8/27/10</u> |
| Revision Code: | <u>F-1</u> | AWC Project Biologist | Date |
| | | _____ | _____ |
| | | Cartographer | Date |

OBSERVATION INFORMATION

| Species | Date(s) Observed | Spawning | Rearing | Present | Anadromous |
|----------------|------------------|----------|---------|---------|-------------------------------------|
| SOCKEYE SALMON | 2008 | | | X | <input checked="" type="checkbox"/> |
| | | | | | <input type="checkbox"/> |
| | | | | | <input type="checkbox"/> |
| | | | | | <input type="checkbox"/> |
| | | | | | <input type="checkbox"/> |

IMPORTANT: Provide all supporting documentation that this water body is important for the spawning, rearing or migration of anadromous fish, including: number of fish and life stages observed; sampling methods, sampling duration and area sampled; copies of field notes; etc. Attach a copy of a map showing location of mouth and observed upper extent of each species, as well as other information such as: specific stream reaches observed as spawning or rearing habitat; locations, types, and heights of any barriers; etc.

Comments: Attached report supports inclusion of sockeye salmon in AWC water bodies

Name of Observer (please print): J. Johnson Date: 8/27/2010
 Signature: _____
 Agency: ADFG SF
 Address: 333 Raspberry Road
Anchorage, AK 99518

This certifies that in my best professional judgment and belief the above information is evidence that this waterbody should be included in or deleted from the Anadromous Waters Catalog.

Signature of Area Biologist: _____ Date: _____ Revision 05/08
 Name of Area Biologist (please print): _____

**Assessment of Gulkana Hatchery Sockeye Straying into Upper
Copper River Tributaries**

**Allison Bidlack*, Science Coordinator
Ecotrust Copper River Program**

**Erica McCall Valentine, Director
Ecotrust Copper River Program**

**PO Box 626
Cordova, Alaska 99574**

***abidlack@ecotrust.org; 907-424-3541**

13 October 2009

Abstract

Since the inception of the Gulkana Hatchery in 1973 in the upper Copper River Basin, there has been no effort to address the question of whether or not enhanced fish are straying into tributaries of the Copper River, or what effect this may have on the unique spawning stocks of this region. In 2008 we surveyed six sites in sub-drainages of the upper Copper River to document any occurrence of marked sockeye salmon from the Gulkana Hatchery that had strayed into and died in wild salmon spawning streams. A microscopic analysis of recovered otoliths from spawned-out carcasses revealed no evidence of hatchery-marked fish in surveyed wild salmon streams and lakes.

Introduction

To insure the long term sustainability of wild sockeye salmon (*Oncorhynchus nerka*) stocks in the Copper River, managers need to know whether hatchery-produced salmon are straying into, and spawning in, wild salmon streams. Interactions between wild and hatchery fish may lead to changes in physical and behavioral traits of wild salmon, and may ultimately lead to the decline of wild populations (Naish et al., 2008; NRC 1996). Concerns regarding changing wild salmon populations and impacts of supplemented salmon have been raised by basin residents in the Ecotrust-sponsored Copper River Salmon Workshops I and II (Ecotrust, 2005 & 2006). Furthermore, information concerning occurrence and rates of straying was emphasized as a condition for the sustainability certification of the Copper River by the Marine Stewardship Council in its five year re-assessment of Alaska salmon fisheries (Marine Stewardship Council, 2007). In a first attempt to examine this issue, we sampled sub-drainages of the upper Copper River to document any occurrence of strontium-marked sockeye salmon from the Gulkana Hatchery that have strayed into and died in wild salmon spawning streams.

The Copper River is renowned for its production of wild sockeye salmon. Subsistence uses of salmon in the Copper River date back hundreds if not thousands of years (Simeone and Kari, 2002.). Contemporary subsistence fisheries operate at the river's mouth, along the main stem of the upper Copper, and at the headwaters tributary of Tanada Creek. These fisheries, combined with the upriver sport fishery and the personal use fishery operating near Chitina, harvest around 200,000 fish per year (Somerville, 2008). Additionally, a commercial fishery has operated at the river's mouth for over 100 years, and Copper River salmon are highly prized in fish markets throughout the United States. Commercial harvests of Copper River sockeye salmon have been as high as three million fish in 1997, and have averaged 1.5 million annually over the past decade (Botz et al., 2008).

Since 1973 the Gulkana Hatchery, located on the Gulkana River (Figure) has been releasing sockeye salmon fry into the Copper River watershed. This facility, owned by the State of Alaska, is operated by Prince William Sound Aquaculture Corporation (PWSAC). The hatchery consists of two spring-fed incubation facilities. Broodstock is taken at the hatchery site, and fry are released in the spring either volitionally into Paxson and Summit Lakes (from Gunn Creek) or stocked into Crosswind Lake where they rear to the smolt stage. Annual fry releases from this facility increased from less than 200,000 in

1973 to over 30 million in 1996 (PWSAC, 2007). Over the past decade, adult sockeye salmon returns to the Copper River from Gulkana Hatchery production were estimated to be as high as 1,119,000 salmon in 1999, and have averaged 422,301 per year (Botz et al., 2008), or 21.5% of the total upper Copper River sockeye run.

Evaluation of the enhanced fish returning to the Copper River has been ongoing since the hatchery's inception. Coded wire tagging was used through 2003; however, this technique had limitations because it required tagging smolts a year after their release from the facility. In 2000 strontium chloride was evaluated as a mass marking technique for Gulkana Hatchery sockeye salmon (Oxman et.al., 2004). By immersing fry into a bath of strontium chloride, a mark was left on the otolith that could be detected on the adult fish using scanning electron microscopy. Starting in 2001, 100% of the Gulkana Hatchery fry have received strontium marks. In 2003, the Alaska Department of Fish and Game (ADF&G) began using the otolith marking program to estimate the proportion of the commercial and personal use harvests that are made up by Gulkana Hatchery enhanced fish. These estimates assume that 100% of the marks are detectable; however, vouchers of known marked fry have not been tested at this time. According to recent ADF&G estimates, Gulkana Hatchery fish comprised on average 20.6% of the Copper River commercial, subsistence, personal use and sport catch between 1997 and 2006, (Botz et al., 2008).

There are numerous spawning stocks of sockeye salmon in the Copper River watershed, each exhibiting unique spatial, temporal, behavioral and physiological adaptations (Wade et.al., 2007). A complex management plan aims to provide harvest allocations to the various fisheries while insuring spawning escapement needs are met to sustain the diverse wild population. Returning Gulkana Hatchery fish add to the complexity of this plan. Hatchery fish are known to stray into wild streams, but the full impact of hatchery fish on wild salmon populations and river ecosystems is still unclear (see Naish et al., 2008 for a review). Interactions between wild and hatchery fish may lead to changes in genetic structure of wild populations resulting from interbreeding and competition (at all life stages, including on the spawning grounds), and may ultimately lead to the decline of wild populations. Since the inception of the Gulkana Hatchery, there has been no effort to address the question of whether or not enhanced fish are straying into tributaries of the Copper River, or what effect this may have on the unique spawning stocks of this region. This project addresses this gap in our knowledge of sockeye salmon management in this system by documenting any presence of hatchery fish in wild salmon streams and lakes in the upper Copper River basin.

Methods

We sampled six known sockeye spawning sites in the upper Copper River Basin: Swede, Dickey, Upper Fish, lower Paxson, and Mentasta lakes were surveyed, as well as Gunn Creek (Figure).

Otolith sampling occurred opportunistically between July and September 2008, based on reports of salmon carcasses seen by Glenn Hollowell of the ADF&G in the course of survey flights in the upper Copper River basin, as well as reports from local residents.

Once carcasses were spotted, all efforts were made to sample these areas before carcasses were washed downstream. Otoliths were taken only from "spawned-out" carcasses, not live fish. Carcasses were sampled randomly, up to 96 fish per site. Both otoliths were recovered where possible, and sex of sampled fish was noted. GPS coordinates of each sample location were recorded.

All collected otoliths were sent to the Advanced Instrumentation Laboratory lab at the University of Alaska Fairbanks for analysis. The strontium mark can only be visualized with a scanning electron microscope (SEM), run by personnel experienced in microscopy and otolith structure and formation. Otoliths were individually mounted, then ground and polished to the proper viewing area for mark determination. All otoliths were inspected through a light microscope for crystalline status, age, and presence of thermal marking (from other hatcheries in Prince William Sound). They were then mounted on another slide, cleaned, and carbon coated in preparation for the SEM. Presence or absence of strontium hatchery mark was recorded and pictures were taken for each sample.

Results and Discussion

We collected otoliths from 448 fish from six sites; otoliths from 426 were readable under the SEM (Table). None of the fish had thermal marks, and there were no strontium marks on otoliths from any sites except Gunn Creek, where 100% of the otoliths examined were marked. We are confident that the strontium otolith results are accurate, within an error rate of approximately three percent. A blind test was conducted in 2009, with the remaining otoliths from 36 previously-run samples being returned to the SEM lab for analysis. Of the 36 samples, 35 matched the previous results (data not shown).

Gunn Creek presents an unusual situation, in that hatchery fry are generally released directly into the creek, and are intercepted on their return as adults by a weir across the creek mouth (Gary Martinek, *pers. comm.*). In 2008, however, no weir was erected, allowing all fish to return upstream. Therefore, these fish are not considered strays. However, it is possible that the wild run in Gunn Creek (thought to be several hundred fish) could have been negatively impacted by these hatchery returns in 2008. The wild run is generally earlier, so any redds laid by these fish may have been disturbed by spawning hatchery fish.

The absence of hatchery-marked fish in drainages was not entirely surprising given the high fidelity to natal sites in sockeye salmon (Quinn et al., 1999). This low straying rate is conducive to hatchery operations that have minimal impact to wild populations, and make sockeye salmon a potentially good choice for hatchery production. The absence of any evidence of hatchery-marked fish in wild salmon streams and lakes in the upper Copper River basin in this study is an encouraging result. The results of this study serve as a baseline, and we recommend that further surveys be conducted in subsequent years to monitor the situation. In addition, ecological interactions between Gunn Creek wild and hatchery fish should be investigated, and any genetic introgression or disease transmission should be evaluated.

Acknowledgments

We would like to thank Carla Somerville for help in the field, Mark Somerville for providing logistical assistance and equipment, and Glenn Hollowell for providing aerial survey data. Gary Martinek of the Gulkana Hatchery gave comments on the study design and provided background information. Dr. Ken Severin and Dayna Norris of the Advanced Instrumentation Laboratory at UAF ran the otolith samples, and Mentasta Village kindly gave us permission to access Mentasta Lake to sample fish.

References

- Botz, J., R. Brenner, G. Hollowell, B. Lewis and S. Moffitt. 2008. 2006 Prince William Sound Area Finfish Management Report. Fishery Management Report No. 08-30. Alaska Department of Fish and Game, Commercial Fisheries, Cordova, Alaska.
- Ecotrust. 2006. Copper River Salmon Workshop II, March 28-30, 2006. Ecotrust Copper River Program. Cordova, Alaska. <http://www.ecotrust.org/copperriver/workshop/index.html>
- Ecotrust. 2005. Copper River Salmon Workshop I, April 12-14, 2005. Ecotrust Copper River Program. Cordova, Alaska. <http://www.ecotrust.org/copperriver/workshop/index.html>
- Marine Stewardship Council. 2007. The Commercial Alaska Salmon Fisheries Managed by the Alaska Department of Fish and Game, A 5-Year Re-Assessment Based on the Marine Stewardship Council Program, Emeryville, CA. http://www.msc.org/html/content_485.htm
- Naish, K., J. Taylor III, P. Levin, T. Quinn, J. Winton, D. Huppert and R. Hillborn. 2008. An evaluation of the effects of conservation and fishery enhancement hatcheries on wild populations of salmon. *Advances in Marine Biology* 53: 61-194.
- National Research Council. 1996. *Upstream: Salmon and Society in the Pacific Northwest*. National Academy Press, Washington DC.
- Oxman, D., B. Agler, P. Hagen, R. Josephson, G. Martinek, J. Nolte and J. Cashen. 2004. Strontium Chloride (SrCl-H₂O) as a Mass-Marker for Salmonid Otoliths in Alaska. North Pacific Anadromous Fish Commission Technical Report No. 5. Vancouver, B.C.
- PWSAC. 2007. Gulkana Hatchery Production Summary. Prince William Sound Aquaculture Corporation, Cordova, Alaska. <http://www.pwsac.com/gh.htm>
- Quinn, T. P., E. C. Volk, and A. P. Hendry. 1999. Natural otolith microstructure patterns reveal precise homing to natal incubation sites by sockeye salmon (*Oncorhynchus nerka*). *Canadian Journal of Zoology* 77: 766-775.

Simeone, W. and J. Kari. 2002. Traditional knowledge and fishing practices of the Antna of the Copper River, Alaska. Technical Paper No. 27. Alaska Department of Fish and Game, Division of Subsistence, Juneau, Alaska.

Sommerville, M. 2008. Fishery Management Report for the Recreational Fisheries of the Upper Copper/Upper Susitna River Management Area, 2006. Fishery Management Report No. 08-33. Alaska Department of Fish and Game, Division of Sport Fish. Fairbanks, Alaska.

Wade, G., J.J. Smith, K. M. van de Brock and J. W. Saveride. 2007. Spawning distribution and run timing of Copper River Sockeye Salmon, 2006 Annual Report for Study 05-501. U.S.F.W.S., Office of Subsistence Management, Fisheries Monitoring Program, Alaska.

Figure. Sample site locations (denoted by stars) and hatchery locations (round fish symbols). Upper inset shows Copper River watershed boundary within State of Alaska. Lower inset shows six survey sites (one furthest right is Mentasta Lake).

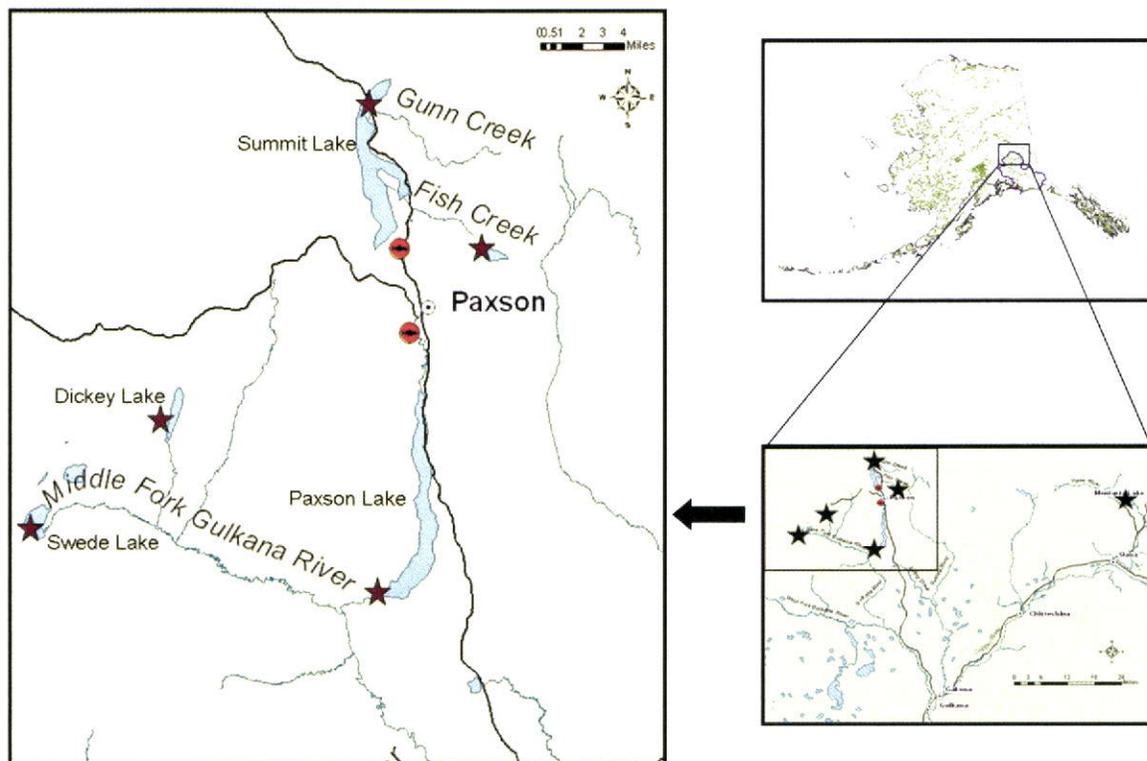


Table. Sample site locations, dates and numbers collected, sex ratio of samples, and otolith markings.

| Date Collected | Site Name | Anadromous Stream Number | Total # Samples | # Readable Samples | % Female | % Hatchery Origin |
|----------------|-------------------------|----------------------------------|-----------------|--------------------|----------|-------------------|
| 8/22/2008 | Swede Lake | 212-20-10080-2461-3171-4042-0010 | 96 | 94 | 64 | 0 |
| 8/22/2008 | Dickey Lake | 212-20-10080-2461-3171-0030 | 14 | 14 | 29 | 0 |
| 8/24/2008 | Upper Fish Lake | 212-20-10080-2461-3272-0020 | 72 | 71 | 60 | 0 |
| 8/25/2008 | Mentasta Lake | 212-20-10080-2605-3050-0010 | 96 | 94 | 44 | 0 |
| 9/25/2008 | Paxson Lake (South End) | 212-20-10080-2461 | 96 | 83 | 50 | 0 |
| 9/26/2008 | Gunn Creek | 212-20-10080-2461-3292 | 74 | 70 | 66 | 100 |
| Total | | | 448 | 426 | | |

Johnson, J D (DFG)

From: Somerville, Mark A (DFG)
Sent: Wednesday, January 20, 2010 11:00 AM
To: Johnson, J D (DFG)
Cc: Parker, Fronty (DFG); Allison Bidlack
Subject: FW: Dickey & Swede lakes, Gunn Creek

Woops. Ment to send that to J.

Mark A. Somerville
Area Management Biologist
Alaska Department of Fish and Game
PO Box 47
Glennallen, AK 99588
phone: 907-822-3309
fax: 907-822-3811
cell: 907-259-4415

From: Somerville, Mark A (DFG)
Sent: Wednesday, January 20, 2010 10:58 AM
To: Parker, Fronty (DFG)
Cc: 'Allison Bidlack'
Subject: RE: Dickey & Swede lakes, Gunn Creek

Eco-trust sampled carcasses from the following locations. Contact Alison Bidlack.

Glenn Hollowell has many years of aerial survey data as do we in this office from the days of Ken Roberson. Both Dicky and Swede Lakes are deep enough for rearing sockeye.

Barto, D.L., V.L. Nelson, and R.F. Pelissier. 1984. Field data summary for Copper River and Prince William Sound lake investigations, 1983. Prince William Sound Aquaculture, ADFG Contract No. 83-0526 noted sockeye carcasses at the mouth of one inlet stream to the west side of Swede Lake.

Gunn Creek has a substantial return of sockeye, but it is doubtful they still reach and use the lake as the lake has sedimented in.

MAS

Table. Sample site locations, dates and numbers collected, sex ratio of samples, and otolith markings.

| Date Collected | Site Name | Anadromous Stream Number | Total # Samples | # Readable Samples | % Female |
|----------------|-------------------------|----------------------------------|-----------------|--------------------|----------|
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| 8/25/2008 | Mentasta Lake | 212-20-10080-2605-3050-0010 | 96 | 94 | 44 |
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| Total | | | 448 | 426 | |

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phone: 907-822-3309
fax: 907-822-3811
cell: 907-259-4415

From: Parker, Fronty (DFG)
Sent: Wednesday, January 20, 2010 10:18 AM
To: Johnson, J D (DFG)
Cc: Somerville, Mark A (DFG)
Subject: RE: Dickey & Swede lakes, Gunn Creek

Yes, spawning fish in all these systems, you mentioned, but I am going to allow Mark Somerville the Glennallen Area Biologist for these waters to address the data needs you have.

Fronty Parker
895-4632

From: Johnson, J D (DFG)
Sent: Wednesday, January 20, 2010 9:53 AM
To: Burr, John M (DFG); Parker, Fronty (DFG)
Cc: Evenson, Matthew J (DFG)
Subject: Dickey & Swede lakes, Gunn Creek

Greetings All

According to the AWC sockeye salmon rearing/spawning are found in Swede Lake, spawning sockeye salmon in Dickey Lake and spawning sockeye salmon in Gunn Creek but no nominations exist to substantiate these listings. Have any of you have first hand knowledge or know of some one w/knowledge of these fish in these water bodies. If so, let me know

I'll be out of the office beginning Jan 25th thru Feb 2 (possibly Feb 8th). I will not be checking email or phone messages while out of the office

J. Johnson
ADF&G
AWC Project Biologist
267-2337

Johnson, J D (DFG)

From: Parker, Fronty (DFG)
Sent: Wednesday, January 20, 2010 11:09 AM
To: Johnson, J D (DFG)
Cc: Wuttig, Klaus G (DFG)
Subject: RE: Dickey & Swede lakes, Gunn Creek

These are studies done by Klaus Wuttig (SF-FBS) who did population work in this area (early 2000?) for a number of years.

Fronty Parker
895-4632

From: Johnson, J D (DFG)
Sent: Wednesday, January 20, 2010 10:54 AM
To: Parker, Fronty (DFG)
Subject: RE: Dickey & Swede lakes, Gunn Creek

Steelhead trout are not listed in AWC for those areas except Hungry Hollow, when were your observations made?

From: Parker, Fronty (DFG)
Sent: Wednesday, January 20, 2010 10:51 AM
To: Johnson, J D (DFG)
Subject: RE: Dickey & Swede lakes, Gunn Creek

I do know there are spawning anadromous RT spawning in the Dickey Lake outlet area as well as the Swede Lake outlet & Hungry Hollow drainage area, I don't know if this an species of interest or not, but should not be overlooked.

Fronty Parker
895-4632

From: Johnson, J D (DFG)
Sent: Wednesday, January 20, 2010 10:40 AM
To: Parker, Fronty (DFG)
Cc: Somerville, Mark A (DFG)
Subject: RE: Dickey & Swede lakes, Gunn Creek

Thx Fronty

Bob Clark and I went thru the list of folks that might have actually visited those spots I'll get w/Mark as I have funds for a Glenallen F&G employee to go thru the records.

thx

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Johnson, J D (DFG)

From: Evenson, Matthew J (DFG)
Sent: Wednesday, January 20, 2010 11:22 AM
To: Johnson, J D (DFG); Burr, John M (DFG); Parker, Fronty (DFG)
Cc: Taube, Tom (DFG); Somerville, Mark A (DFG)
Subject: RE: Dickey & Swede lakes, Gunn Creek

Hey J., I have personally seen spawning sockeye salmon in Swede Lake and in the lower stretches of Gunn Creek. Maybe Mark or Tom can help out with any written documentation (or other personal accounts). Matt.

From: Johnson, J D (DFG)
Sent: Wednesday, January 20, 2010 9:53 AM
To: Burr, John M (DFG); Parker, Fronty (DFG)
Cc: Evenson, Matthew J (DFG)
Subject: Dickey & Swede lakes, Gunn Creek

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267-2337

Johnson, J D (DFG)

From: Wuttig, Klaus G (DFG)
Sent: Friday, January 22, 2010 4:09 PM
To: Parker, Fronty (DFG); Johnson, J D (DFG)
Subject: RE: Dickey & Swede lakes, Gunn Creek
Attachments: Copper River Steelhead 2005-2006 JS AC KW RK-mje-osm edits.doc

Here is a reports that may help for steelhead. We worked in Dickey lake from 2001-2003. The other report is FDS 04-18, which was too big to send via email.

From: Parker, Fronty (DFG)
Sent: Wednesday, January 20, 2010 11:09 AM
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Cc: Wuttig, Klaus G (DFG)
Subject: RE: Dickey & Swede lakes, Gunn Creek

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I'll be out of the office beginning Jan 25th thru Feb 2 (possibly Feb 8th). I will not be checking email or phone messages while out of the office

J. Johnson
ADF&G
AWC Project Biologist
267-2337

Johnson, J D (DFG)

From: Allison Bidlack [albidlack@gmail.com]
Sent: Tuesday, January 26, 2010 9:52 PM
To: Johnson, J D (DFG)
Subject: Re: Dickey & Swede lakes, Gunn Creek

Hi J,

I'll get that report to you when I return from vacation next month.

-allison

On 1/22/10, Johnson, J D (DFG) <j.johnson@alaska.gov> wrote:

> Hi Allison

>

>

>

> I would be very interested a copy of the report Mark mentioned

>

> Regarding sampling at locations listed in the table below

>

>

>

> Thx

>

>

>

> JJ

>

>

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>

>

> _____
> From: Somerville, Mark A (DFG)
> Sent: Wednesday, January 20, 2010 11:00 AM
> To: Johnson, J D (DFG)
> Cc: Parker, Fronty (DFG); Allison Bidlack
> Subject: FW: Dickey & Swede lakes, Gunn Creek

>

>

>

> Woops. Ment to send that to J.

>

>

>

> Mark A. Somerville
> Area Management Biologist
> Alaska Department of Fish and Game
> PO Box 47
> Glennallen, AK 99588
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>
>
>
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>
>
>
> Glenn Hollowell has many years of aerial survey data as do we in this
> office from the days of Ken Roberson. Both Dicky and Swede Lakes are
> deep enough for rearing sockeye.
>
>
>
> Barto, D.L., V.L. Nelson, and R.F. Pelissier. 1984. Field data summary
> for Copper River and Prince William Sound lake investigations, 1983.
> Prince William Sound Aquaculture, ADFG Contract No. 83-0526 noted
> sockeye carcasses at the mouth of one inlet stream to the west side of
> Swede Lake.
>
>
>
> Gunn Creek has a substantial return of sockeye, but it is doubtful
> they still reach and use the lake as the lake has sedimented in.
>
>
>
> MAS
>
>
>
>
>
>
> Table. Sample site locations, dates and numbers collected, sex ratio
> of samples, and otolith markings.
>
>
>
> Date Collected
>
> Site Name
>
> Anadromous Stream Number
>
> Total # Samples
>
> # Readable Samples
>
>

>
>
>
> % Female
>
>
>
> % Hatchery Origin
>
> 8/22/2008
>
> Swede Lake
>
> 212-20-10080-2461-3171-4042-0010
>
> 96
>
> 94
>
> 64
>
> 0
>
> 8/22/2008
>
> Dickey Lake
>
> 212-20-10080-2461-3171-0030
>
> 14
>
> 14
>
> 29
>
> 0
>
> 8/24/2008
>
> Upper Fish Lake
>
> 212-20-10080-2461-3272-0020
>
> 72
>
> 71
>
> 60
>
> 0
>
> 8/25/2008
>
> Mentasta Lake
>
> 212-20-10080-2605-3050-0010
>

> 96
>
> 94
>
> 44
>
> 0
>
> 9/25/2008
>
> Paxson Lake (South End)
>
> 212-20-10080-2461
>
> 96
>
> 83
>
> 50
>
> 0
>
> 9/26/2008
>
> Gunn Creek
>
> 212-20-10080-2461-3292
>
> 74
>
> 70
>
> 66
>
> 100
>
>
>
>
>
>
> Total
>
> 448
>
> 426
>
>
>
>
>
>
>
>
>
> Mark A. Somerville
> Area Management Biologist
> Alaska Department of Fish and Game

> PO Box 47
> Glennallen, AK 99588
> phone: 907-822-3309
> fax: 907-822-3811
> cell: 907-259-4415

> From: Parker, Fronty (DFG)
> Sent: Wednesday, January 20, 2010 10:18 AM
> To: Johnson, J D (DFG)
> Cc: Somerville, Mark A (DFG)
> Subject: RE: Dickey & Swede lakes, Gunn Creek

> Yes, spawning fish in all these systems, you mentioned, but I am going
> to allow Mark Somerville the Glennallen Area Biologist for these
> waters to address the data needs you have.

> Fronty Parker
> 895-4632

> From: Johnson, J D (DFG)
> Sent: Wednesday, January 20, 2010 9:53 AM
> To: Burr, John M (DFG); Parker, Fronty (DFG)
> Cc: Evenson, Matthew J (DFG)
> Subject: Dickey & Swede lakes, Gunn Creek

> Greetings All

> According to the AWC sockeye salmon rearing/spawning are found in
> Swede Lake, spawning sockeye salmon in Dickey Lake and spawning
> sockeye salmon in Gunn Creek but no nominations exist to substantiate these listings.
> Have any of you have first hand knowledge or know of some one
> w/knowledge of these fish in these water bodies. If so, let me know

> I'll be out of the office beginning Jan 25th thru Feb 2 (possibly Feb
> 8th). I will not be checking email or phone messages while out of the
> office

>
>
>
> J. Johnson
>
> ADF&G
>
> AWC Project Biologist
>
> 267-2337
>
>
>
>
>
>
>
>
>

Johnson, J D (DFG)

From: Parker, Fronty (DFG)
Sent: Wednesday, January 20, 2010 10:51 AM
To: Johnson, J D (DFG)
Subject: RE: Dickey & Swede lakes, Gunn Creek

I do know there are spawning anadromous RT spawning in the Dickey Lake outlet area as well as the Swede Lake outlet & Hungry Hollow drainage area, I don't know if this an species of interest or not, but should not be overlooked.

Fronty Parker
895-4632

From: Johnson, J D (DFG)
Sent: Wednesday, January 20, 2010 10:40 AM
To: Parker, Fronty (DFG)
Cc: Somerville, Mark A (DFG)
Subject: RE: Dickey & Swede lakes, Gunn Creek

Thx Fronty

Bob Clark and I went thru the list of folks that might have actually visited those spots I'll get w/Mark as I have funds for a Glenallen F&G employee to go thru the records.

thx

From: Parker, Fronty (DFG)
Sent: Wednesday, January 20, 2010 10:18 AM
To: Johnson, J D (DFG)
Cc: Somerville, Mark A (DFG)
Subject: RE: Dickey & Swede lakes, Gunn Creek

Yes, spawning fish in all these systems, you mentioned, but I am going to allow Mark Somerville the Glennallen Area Biologist for these waters to address the data needs you have.

Fronty Parker
895-4632

From: Johnson, J D (DFG)
Sent: Wednesday, January 20, 2010 9:53 AM
To: Burr, John M (DFG); Parker, Fronty (DFG)
Cc: Evenson, Matthew J (DFG)
Subject: Dickey & Swede lakes, Gunn Creek

Greetings All

According to the AWC sockeye salmon rearing/spawning are found in Swede Lake, spawning sockeye salmon in Dickey Lake and spawning sockeye salmon in Gunn Creek but no nominations exist to substantiate these listings. Have any of you have first hand knowledge or know of some one w/knowledge of these fish in these water bodies. If so, let me know

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J. Johnson
ADF&G
AWC Project Biologist
267-2337

| REGION | QTMQUADS | ITMQUAD | EDITCODE | NOMNUMBR | AWCNUMBR | STRMNAME | YEAR |
|--------|----------|---------|----------|----------|----------------------------------|---------------------------|------|
| SCN | 057 | A-3 | F-1 | 10-740 | 212-20-10080 | Copper River | 2011 |
| SCN | 057 | B-2 | F-1 | 10-740 | 212-20-10080 | Copper River | 2011 |
| SCN | 057 | B-3 | F-1 | 10-740 | 212-20-10080 | Copper River | 2011 |
| SCN | 057 | C-2 | F-1 | 10-740 | 212-20-10080 | Copper River | 2011 |
| SCN | 057 | C-3 | F-1 | 10-740 | 212-20-10080 | Copper River | 2011 |
| SCN | 057 | D-3 | F-1 | 10-740 | 212-20-10080 | Copper River | 2011 |
| SCN | 057 | D-4 | F-1 | 10-740 | 212-20-10080 | Copper River | 2011 |
| SCN | 054 | B-3 | F-1 | 10-740 | 212-20-10080 | Copper River | 2011 |
| SCN | 054 | C-2 | F-1 | 10-740 | 212-20-10080 | Copper River | 2011 |
| SCN | 054 | C-3 | F-1 | 10-740 | 212-20-10080 | Copper River | 2011 |
| SCN | 054 | D-2 | F-1 | 10-740 | 212-20-10080 | Copper River | 2011 |
| SCN | 054 | D-3 | F-1 | 10-740 | 212-20-10080 | Copper River | 2011 |
| SCN | 062 | A-3 | F-1 | 10-740 | 212-20-10080 | Copper River | 2011 |
| SCN | 062 | B-3 | F-1 | 10-740 | 212-20-10080 | Copper River | 2011 |
| SCN | 062 | C-1 | F-1 | 10-740 | 212-20-10080 | Copper River | 2011 |
| SCN | 062 | C-2 | F-1 | 10-740 | 212-20-10080 | Copper River | 2011 |
| SCN | 063 | B-6 | F-1 | 10-740 | 212-20-10080 | Copper River | 2011 |
| SCN | 063 | C-6 | F-1 | 10-740 | 212-20-10080 | Copper River | 2011 |
| SCN | 062 | D-4 | F-1 | 10-740 | 212-20-10080-2461 | Gulkana River | 2011 |
| SCN | 062 | D-5 | F-1 | 10-740 | 212-20-10080-2461-3171 | Middle Fork Gulkana River | 2011 |
| SCN | 062 | D-5 | F-1 | 10-740 | 212-20-10080-2461-3171-0030 | Dickey Lake | 2011 |
| SCN | 062 | D-4 | F-1 | 10-740 | 212-20-10080-2461-3171-4042 | | 2011 |
| SCN | 062 | D-5 | F-1 | 10-740 | 212-20-10080-2461-3171-4042-0010 | Swede Lake | 2011 |
| SCN | 065 | A-4 | F-1 | 10-740 | 212-20-10080-2461-3171-4042-0010 | Swede Lake | 2011 |
| SCN | 065 | A-3 | F-1 | 10-740 | 212-20-10080-2461-3272 | Fish Creek | 2011 |
| SCN | 065 | A-3 | F-1 | 10-740 | 212-20-10080-2461-3272-0020 | Upper Fish Lake | 2011 |
| SCN | 065 | A-3 | F-1 | 10-740 | 212-20-10080-2461-3292 | Gunn Creek | 2011 |
| SCN | 065 | A-4 | F-1 | 10-740 | 212-20-10080-2461-3292 | Gunn Creek | 2011 |
| SCN | 062 | C-1 | F-1 | 10-740 | 212-20-10080-2605 | Slana River | 2011 |
| SCN | 063 | D-6 | F-1 | 10-740 | 212-20-10080-2605 | Slana River | 2011 |
| SCN | 063 | C-6 | F-1 | 10-740 | 212-20-10080-2605 | Slana River | 2011 |
| SCN | 063 | D-6 | F-1 | 10-740 | 212-20-10080-2605-3050 | Mentasta Creek | 2011 |
| SCN | 063 | D-6 | F-1 | 10-740 | 212-20-10080-2605-3050-0010 | Mentasta Lake | 2011 |