Streams-Fish Habitat Question 1 - MIS

Goal: Maintain or restore the natural range and frequency of aquatic habitat conditions on the Tongass National Forest to sustain the diversity and production of fish and other freshwater organisms.

Objectives: Use baseline fish habitat objectives, identified in the Forest Plan Standards and Guidelines, to evaluate the relative condition of riparian and aquatic habitat. Monitor representative fish populations to determine whether trends attributable to current forest management are evident. This monitoring strives to characterize the ecological condition and trends of watersheds and aquatic ecosystems on the Tongass National Forest.

Background: Fish and aquatic resources on the Tongass National Forest provide major subsistence, commercial, and sport fisheries. Abundant rainfall and watersheds with high densities of streams provide a high quantity and diversity of freshwater fish habitats. The Tongass National Forest provides spawning and rearing habitat for the majority of wild fish produced in Southeast Alaska. Maintenance of this habitat and associated waters is a focal point for the public, State and Federal agencies, and Native organizations.

In fiscal year (FY) 2012, statistical analyses of an existing eleven year resident fish (Dolly Varden char and cutthroat trout) dataset was underway. Statistical analysis of the eleven year resident fish dataset is ongoing through the Pacific Northwest Research Station (PNW), Corvallis office, and expected to be completed in manuscript form by the end of 2013. Additionally, the forest initiated an alternate monitoring strategy for Dolly Varden, cutthroat trout and coho salmon to provide effective feedback to inform current Forest management. A summarized study plan is included as Streams-Fish Habitat 1 Appendix A. An interagency aquatics task group convened in 2011 to review the current MIS list and provide feedback and recommendations for improvements or reductions to existing species lists and monitoring protocols. At that time, Dolly Varden (DV), cutthroat trout (CT) and coho salmon were recommended to be retained on the MIS list, while pink salmon were recommended for removal.

Streams–Fish Habitat Question 1: Are the trends in abundance of the fish management indicator species (Dolly Varden char, cutthroat trout, coho salmon, and pink salmon) related to changes in habitat associated with forest management, climate change or other factors?

The Forest Plan identified Dolly Varden char, cutthroat trout, coho salmon and pink salmon as Management Indicator Species (MIS). Dolly Varden char were selected to represent resident fish habitats because of their wide distribution, the availability of data on the species' habitat requirements, and frequent distribution over the full spectrum of resident fish habitats. Dolly Varden char and cutthroat trout were selected because they often reside together in Tongass NF streams and can both be sampled by similar methods. Pink salmon and coho salmon were selected to represent two different periods of salmon life history, spawning/egg incubation and freshwater rearing, respectively.

Resident Dolly Varden Char and Cutthroat Trout Monitoring

Evaluation Criteria

Significant downward trend in Dolly Varden char and cutthroat trout densities in monumented stream reaches due to forest management.

Sampling/Reporting Period

Annual sampling with five year reporting period.

Fourteen watersheds will be sampled over an eight year period. Two of the watersheds will be sampled annually (fixed watersheds) and twelve watersheds will be grouped into four separate panels (panel watersheds) of three watersheds each and sampled on a rotating basis once every four years (Table 1). One of the annually sampled watersheds is within an unmanaged condition currently and into the perceivable future while the other will be representative of past, present and proposed future active management activities. The annually sampled fixed watersheds will allow for the assessment of trends more rapidly as well as provide information on natural variability. The watersheds sampled on a rotating panel basis will ideally represent the range of ecological conditions and forest management across the Forest. The relatively small sample size will not allow for extensive stratification.

Streams-Fish Habitat 1 Table 1. Number of Sample Watersheds and Periodicity of Sampling

Watershed	2012	2013	2014	2015	2016	2017	2018	2019
1 (Managed)	Fixed 1	Fixed 1	Fixed 1	Fixed 1	Fixed 1	Fixed 1	Fixed 1	Fixed 1
2 (Unmanaged)	Fixed 2	Fixed 2	Fixed 2	Fixed 2	Fixed 2	Fixed 2	Fixed 2	Fixed 2
3	Panel 1				Panel 1			
4	Panel 1				Panel 1			
5	Panel 1				Panel 1			
6		Panel 2				Panel 2		
7		Panel 2				Panel 2		
8		Panel 2				Panel 2		
9			Panel 3				Panel 3	
10			Panel 3				Panel 3	
11			Panel 3				Panel 3	
12				Panel 4				Panel 4
13				Panel 4				Panel 4
14				Panel 4				Panel 4

Selected watersheds have populations of: 1) resident Dolly Varden char and/or cutthroat trout upstream of impassable and permanent barrier(s) and coho salmon young-of-the-year and parr in downstream sections. Four resident fish populated stream sections and four coho populated stream sections of approximately 100 meters in length will be sampled within each of the fourteen selected watersheds.

Resident Dolly Varden, resident cutthroat trout and juvenile coho salmon will be monitored for population trends by repeat population estimates in permanently marked closed reaches of stream. In-channel indicators such as residual pool frequency volume and depth, particle size distribution, and large woody debris count using measurement protocols for stream surveys as outlined in the Alaska Region

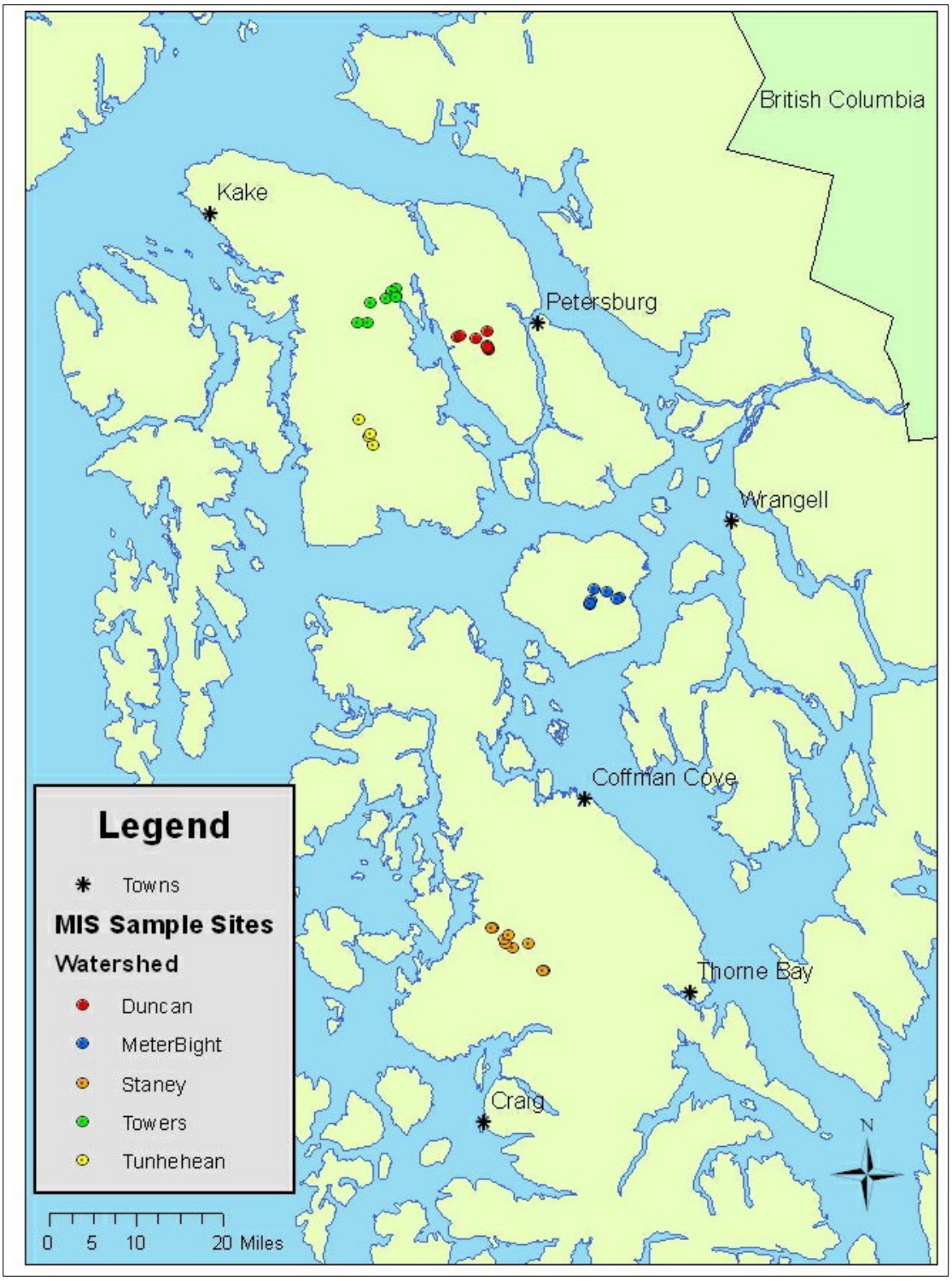
Aquatic Habitat Management Handbook (US Forest Service 2001) will be measured at the reach scale and will coincide with fish sampling.

Monitoring Results

An annual monitoring program for resident Dolly Varden and cutthroat and their habitat was established in 1999 with the purpose of determining the effectiveness of the forest management standards and guidelines for fish habitat as outlined in the Tongass Land and Resource Management Plan. A sample design was established and implemented that monitored streams before and after timber harvest to detect differences between resident Dolly Varden and cutthroat trout abundance (Aho 2000, Bryant 2000). The monitoring protocol included a combination of fish population and stream habitat monitoring. However, after eleven years of data collection (1999-2009) an insufficient number of the monitored streams had timber harvest treatments completed due to timber sale economics and social pressures. Harvest activities were completed at only five of a total of twenty-six previously sampled streams and it is unlikely that more than a few of the remaining treatment sites will be harvested any time soon. While these factors do not eliminate the need to monitor watersheds where forest management in the form of timber harvest and road building occurs, they do dictate changes to monitoring protocols and sample design. The Tongass is transitioning from old growth timber harvest with a larger focus on restoration and young growth management with limited harvest of old growth so the current monitoring protocol redesign should reflect this shift in management focus.

During 2011 potential sample watersheds were evaluated against sample design criteria and several watersheds were selected. Sampling began on five watersheds during 2012 (Figure 1 and Table 2). Additionally, the existing eleven year resident fish monitoring dataset was transferred to the Pacific Northwest Research Station for complete analysis. Analysis of that dataset is ongoing and expected to be completed by late 2013.

The original Tongass resident fish monitoring protocol was redesigned in 2011 to better address current forest management actions. Current monitoring follows the approach established for the Aquatic and Riparian Effectiveness Monitoring Plan for the Pacific Northwest Forest Plan (AREMP) with some modifications per General Technical Report PNW-GTR-577 (Reeves et al. 2003). The current fish habitat effectiveness monitoring framework aims to track watershed condition, in-channel habitat characteristics and abundance of resident populations of Dolly Varden char and cutthroat trout as well as coho salmon in anadromous stream segments downstream of resident sites within several stream reaches in each of fourteen watersheds on the Tongass National Forest. Watersheds sampled are intended to represent the range and degree of management prescriptions across the Tongass. Sample protocol follows a rotating panel design in which fourteen watersheds will be sampled over an eight year period (Table 1).



Streams-Fish Habitat 1 Figure 1. MIS monitoring sites - 2012

Streams-Fish Habitat 1 Table 2. 2012 MIS Watersheds

Watershed	Basin Area (acres)	EcoSubsection	Class I miles	Class II miles	% of Basin Harvested	% of Basin Harvested 2003-2012	% of Basin Harvested 1993-2002	% of Basin Harvested 1983-1992	% of Basin Harvested Pre 1983	Miles of Road	Acres of Road
Staney	39,519	Central POW Volcanics And Central POW Till Lowlands	104	68	79%	0.0%	5.7%	4.2%	69.1%	190	921
Towers	24,097	Duncan Canal Till Lowlands	18	41	0%	0.0%	0.0%	0.0%	0.0%	0	0
Duncan	13,243	Wrangell Narrows Metasediments	28	14	7%	3.4%	0.9%	2.3%	0%	35	171
Tunehean	25,192	Sumner Strait Volcanics	38	25	3%	0.5%	0.8%	0.0%	1.8%	16	79
Meter Bight	16,026	Duncan Canal Till Lowlands (anadromous) and Stikine Strait Complex (resident)	19	28	12%	0.9%	2.2%	0.6%	8.2%	79	382

Evaluation of Results

A thorough analysis of an eleven year resident fish dataset is currently underway and expected to be completed by the end of 2013. The main focus of this analysis is on the physical and biological factors that contribute to observed patterns in the distribution of DV and CT over time. We expect results of this analysis to aid in more focused data collection suite of metrics in future monitoring. Because of the short duration of monitoring efforts under the newly revised protocol, no detailed analysis of results is feasible at this time. Sampling efforts are planned to continue.

Action Plan

No changes to Forest Plan standards and guidelines are recommended at this time.
Project work in FY2013 is expected to include completion of a comprehensive evaluation of the existing eleven year in cooperation with PNW Research Station. Results will assist in determining if measured changes in habitat components (habitat complexity) are able to explain annual fluctuations in fish densities. Results will be published in a technical report. Project work in FY2013 is also expected to include continuation of MIS sampling under the new monitoring protocol that includes fish numbers, in-channel habitat measures, and landscape scale measures in four watersheds annually and fourteen watersheds total over an eight year period with an expansion of fish population estimates to additional reaches within these watersheds to better understand the fish/habitat relationship and fish movement. Including watershed scale features in the analysis will provide additional information on the distribution of fish and interpretation of observed trends in fish numbers. A statistician will be consulted to evaluate the study plan and number of reaches per watershed.

Streams-Fish Habitat 1 Picture 1. Cutthroat trout sampling

Streams-Fish Habitat 1 Picture 2. Minnow trap placement in stream

Coho Salmon Abundance Monitoring

Evaluation Criteria

Evaluate the trends of the ADF&G annual commercial wild coho salmon harvest statistics and escapement estimates from index streams. Comparison of population trends of coho fry and parr associated with a total of fourteen Watersheds representing the range and degree of management prescriptions across the Tongass.

Sampling/Reporting Period

Annual evaluation of ADF&G wild harvest and index stream escapement data. Annual fry and parr sampling with five year reporting period. Rotating panel sampling five watersheds annually with a total of fourteen watersheds sampled over an eight year period (Table 1).

Streams-Fish Habitat 1 Picture 3. Coho salmon

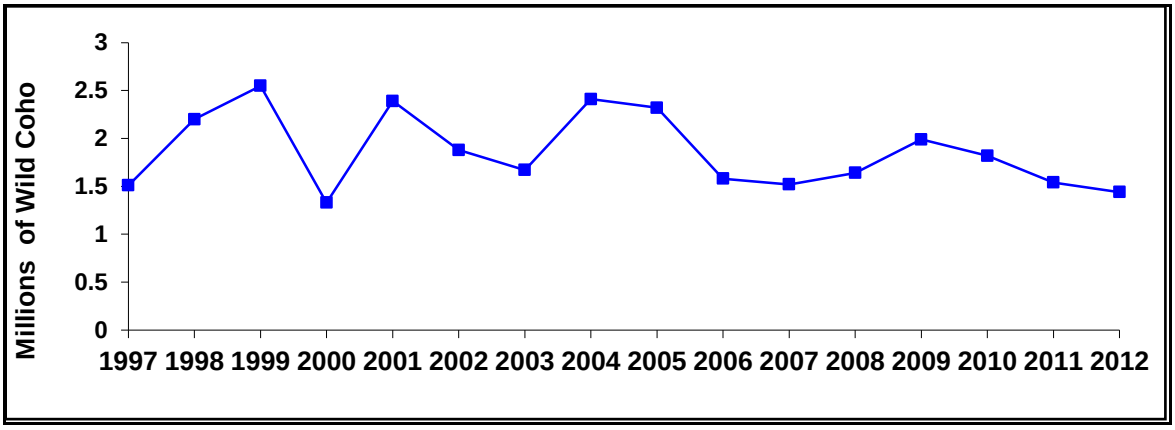
Streams-Fish Habitat 1 Picture 4. Sampling juvenile coho salmon

Streams-Fish Habitat 1 Picture 5. Typical sampling stream.

Monitoring Results

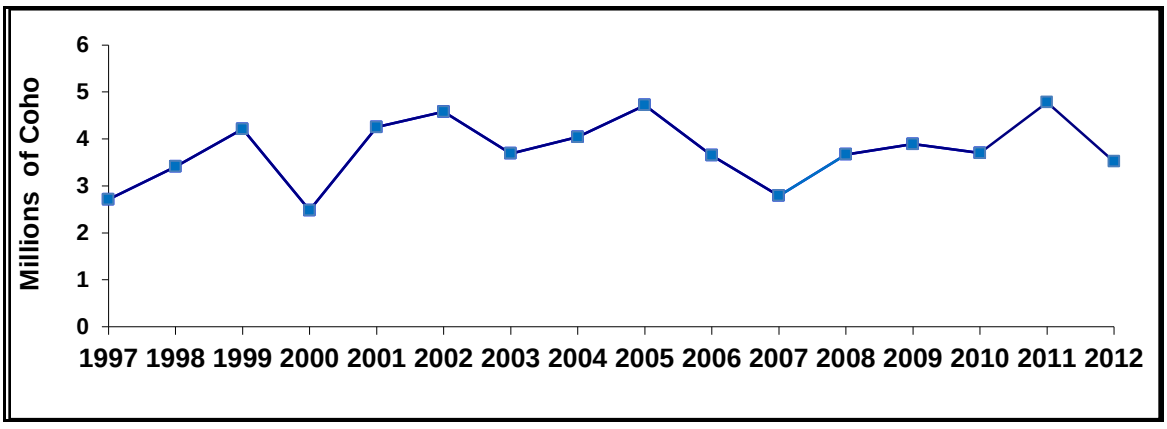
Coho salmon occur in over 2,000 streams in Southeast Alaska. Annual wild commercial harvest of coho salmon in Southeast Alaska is reported by the Alaska Department of Fish and Game, and the Forest Service evaluates these estimates for trends (picture 5). The 2012 estimated wild coho salmon harvest of 1.44 million was seventy-eight percent of the 2002-2011 (ten year) average harvest of 1.84 million (Skannes et al. 2013). Final 2012 estimated wild coho salmon abundance came to 3.52 million fish which was ten percent below the recent twenty-year (1992-2011) average. The 2012 average dressed weight of troll-caught coho salmon (5.8 pounds) was the smallest on record for an even-year, and sixteen percent below average since 1970 (Skannes et al. 2013).

Streams-Fish Habitat 1 Figure 2. Annual wild commercial harvest of coho salmon in Southeast Alaska from 1997 through 2012. Data provided by ADF&G.



ADF&G calculated an index of total wild coho abundance in SE Alaska coastal waters based on the estimated wild troll catch divided by an index of the troll exploitation rate. Troll exploitation rate was determined using four primary indicator stocks with solid total escapement accounting: Auke Creek, located in the northern inside waters average troll exploitation rate was twenty percent in 2012, compared to a long-term average of thirty percent; Ford Arm Lake, located on the outer coast had a forty-seven percent exploitation rate in 2012 which was below the long-term average of fifty-two percent ; Berners River, near Juneau had a twenty-four percent exploitation rate in 2012, coming in way below the long-term average of thirty-five percent; and Hugh Smith Lake, located on the inside waters of Ketchikan had only twenty percent exploitation rate during 2012, remaining low for a fifth consecutive year within a range of nineteen to twenty-four percent, compared to a previous thirty-five percent average. Lower exploitation rates observed in 2012 are thought to be due in part from extensive troller targeting of chum salmon and uncommon coho salmon migration patterns (Skannes et al. 2013). The abundance estimates (Figure 3) are thought to be a better indicator of actual abundance trend rather than the commercial catch because exploitation rate (all gear types) dropped substantially after 1999, due largely to reduced effort because of economic pressures (Shaul et al. 2011).

Streams-Fish Habitat 1 Figure 3. Index of wild coho salmon abundance in Southeast Alaska from 1997 through 2012. Data provided by ADF&G.



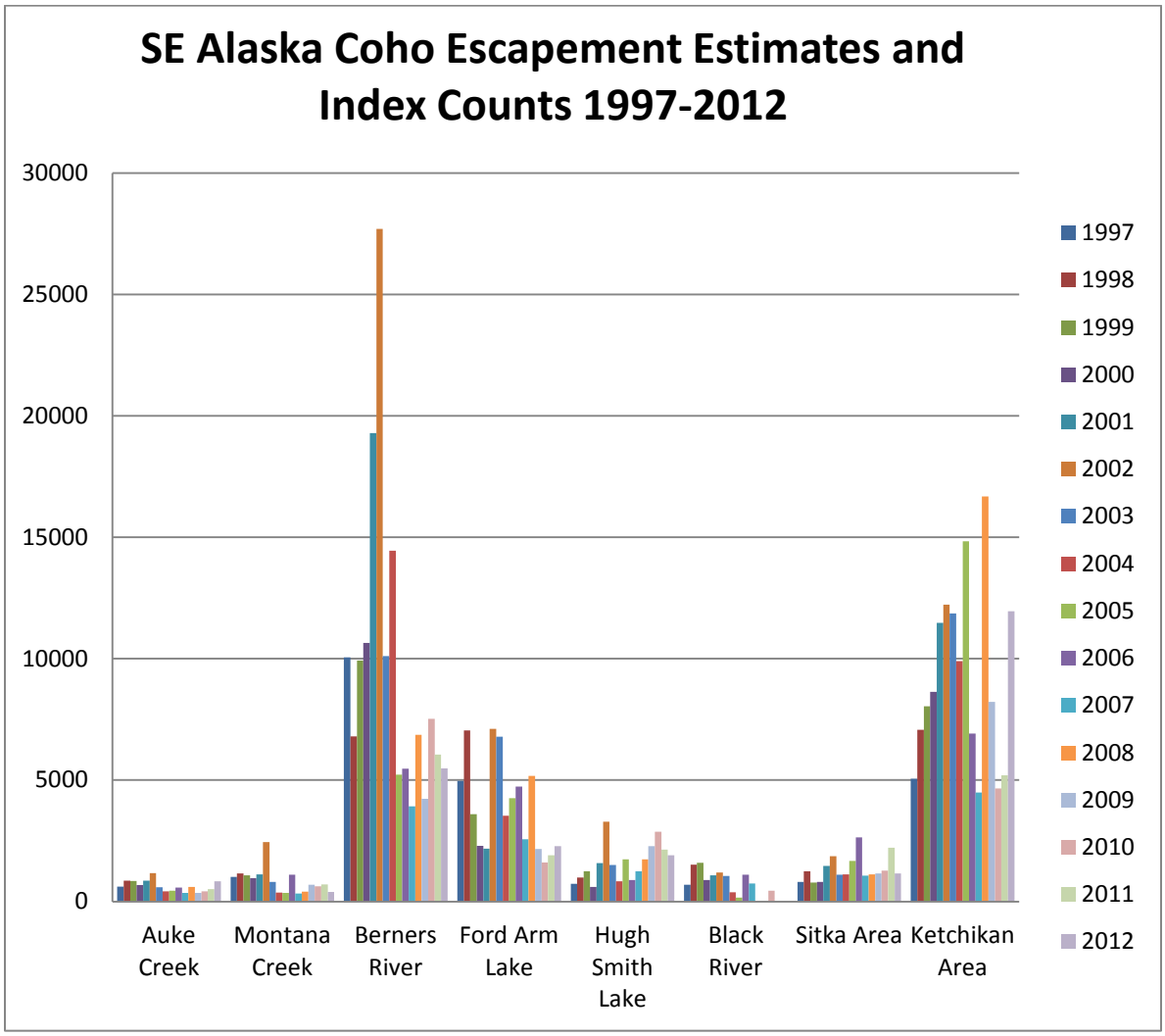
Coho escapements are difficult to estimate since the adults enter spawning streams during the fall when flows are often high and coho routinely distribute throughout the watersheds. The ADF&G has selected a small number of representative streams across Southeast Alaska to carefully count or estimate

escapement, with weirs on three systems and foot or aerial surveys conducted on another twenty-seven streams. Data from these streams and rivers are available for the Forest Service to review for trends and escapement data from a subset of those systems are displayed in Figure 3. The trend in escapement since the early to mid-1980s has been relatively stable for most stocks, with a peak in the early to mid-1990s (Shaul et al. 2011).

Per ADF&G, 2012 coho salmon escapements for the thirteen systems in Southeast Alaska with formal escapement goals were generally within the desired escapement goal ranges (Skannes et al. 2013). While 2005-2007 patterns in marine survival and resulting smolt production and low returns compared to 1982-2004 average raised concerns for some systems, the average survival of monitored stocks in SE Alaska have shown improvement during 2008-2010 with survival rate across all stocks increasing from 9.5 percent to 12.8 percent (Shaul et al. 2011). Escapements to northern inside waters of SE Alaska areas were within or above goal for all stocks, with the exception of Montana Creek (394 spawner peak count below goal of 400 to1,200 spawners and the Situk River in the Yakutat area (Skannes et al. 2013).

Coho appear to be affected by the cyclical productivity of the marine environment including coastal processes. According to ADF&G, Southeast Alaska coho salmon stocks look to be in excellent condition as a whole with no stocks of concern noted (Shaul et al. 2011). However, there appears to be a general downward trend in adult average mid-eye to fork length over time, possibly due to a shift in the marine food web affecting marine growth (Shaul et al. 2011).

Streams-Fish Habitat 1 Figure 4. Annual escapement of coho salmon in index streams from 1997 through 2012. Data provided by ADF&G. Note: Black River was dropped as of 2011.



NOTE: High escapements in 2002 have been attributed to reduced exploitation rates (due in part to low prices) and generally strong returns for indicator stocks. It was this combination that resulted in exceptional escapements in some systems like Berners River and Hugh Smith Lake.

The region-wide commercial harvest estimates, index of total wild coho abundance in Southeast Alaska, and escapement data from index streams are indicators of the annual abundance and potential trends of adult coho returning to Southeast Alaska. Since juvenile coho normally spend one or two years in freshwater, juvenile survival is potentially affected by changes in the quality of stream habitat. Research in the Pacific Northwest and in Southeast Alaska has shown that forest management affects coho salmon on a stream-by-stream basis. Monitoring the abundance of juvenile coho in freshwater appears to be a more direct indicator of potential effects of timber harvest and other management activities as sources of annual variation from marine survival and commercial and sport harvest are largely excluded.

A protocol using juvenile coho salmon to monitor Forest Plan Fish and Riparian Standards and Guidelines was completed in 2008 (Bryant et al. 2008) and provided a quantitative method to measure trends in abundance of juvenile coho salmon in streams flowing through forested watersheds that are exposed to timber harvest with current Forest Plan management prescriptions.

A query for potential monitoring sites with subsequent site visits was completed in 2008-2009. During field season 2009, a total of five treatment sites and five control sites were established and monitored but only one or two additional potential sites were identified. Primarily, the difficulty in identifying qualifying sample sites is due to the protocol stipulation that the treatment sites be located within sub basins that have no timber harvest before Forest Plan guidelines were implemented and any harvest that does exist to have occurred no more than four years from the start of sampling. Most of the recent timber harvest and proposed timber harvest on the Forest is located within sub-basins with pre-existing older harvest units. It was determined that sufficient sampling sites as defined in the protocol were not attainable.

Freshwater coho fish population monitoring was placed on hold during 2010 to 2011 in order to redesign the monitoring protocol to better address current forest management actions with additional emphasis on watershed restoration and young growth management with limited harvest of old growth. The current fish habitat monitoring framework tracks the watershed condition, in-channel habitat characteristics and abundance of populations of juvenile coho salmon within several stream reaches in each of fourteen watersheds on the Tongass National Forest. Watersheds sampled represent the range and degree of management prescriptions across the Tongass. Sample protocol follows a rotating panel design in which fourteen watersheds are planned for sampling over an eight year period. In any one year five watersheds will be sampled, two of which are re-sampled on a four year basis and two sampled every year. One of the annually sampled watersheds is intensively managed while the other is in a natural condition.

In 2012, sampling was completed in five watersheds during July-August (Figure 1 and Table 2). The Watershed Restoration Effectiveness Monitoring (WREM) project also addresses coho salmon population monitoring associated with in-stream restoration projects. Refer to Soil and Water Question 21– Watershed Health response for further detail. Annual review of ADF&G's commercial harvest and wild stock escapement data will continue to aid analyses.

Evaluation of Results

Because of the short duration of monitoring efforts under the newly revised protocol, no detailed analysis of results is feasible at this time. Sampling efforts are planned to continue. Escapements to ADF&G monitored coho salmon streams remained within or above biological escapement goals during 2008-2012 with only three exceptions, the Lost River in 2011 and the Situk River and Montana Creek in 2012 (Skannes et al, 2013).

While 2005 to 2007 patterns in marine survival and resulting smolt production and low returns compared to the period 1982-2004 average raised concerns for some systems, the average survival of monitored stocks in SE Alaska began to show improvement during 2008 to 2010 with survival rate across all stocks increasing from 9.5 percent to 12.8 percent (Shaul et al, 2011). In 2012, survival rates appeared to decline again (Skannes et al, 2013). Coho appear to be affected by the cyclical productivity of the marine environment including coastal processes. According to ADF&G, Southeast Alaska coho salmon stocks look to be in excellent condition as a whole with no stocks of concern noted at this time (Shaul et al, 2011). The Forest plans to continue to work with ADF&G's commercial harvest and escapement statistics.

Action Plan

No changes to Forest Plan standards and guidelines are recommended at this time. Continue to evaluate ADF&G's commercial harvest and escapement statistics. Project work in 2013 is expected to continue to implement the new monitoring protocol that includes fish numbers and in-channel habitat measures with an expansion of fish population estimates to reaches within selected watersheds for specified watersheds based on rotating panel approach. A total of five watersheds will be sampled annually for a total of

fourteen watersheds over an eight year period (refer back to resident fish monitoring section for rotating panel sampling design). Work in 2013 is also expected to include watershed scale features in the analysis to provide additional information on the distribution of fish and interpretation of observed trends in fish numbers. A statistician will be consulted to evaluate the study plan and number of reaches per watershed.

Pink Salmon Abundance Monitoring

Evaluation Criteria

Evaluate the trends of the ADF&G annual Southeast Alaska commercial pink salmon harvest statistics and escapement estimates from index streams.

Sampling/Reporting Period

Annual evaluation of ADF&G harvest and index stream escapement data.

Monitoring Results

There are more than 2,500 streams in Southeast Alaska in which pink salmon are known to spawn (Piston and Heinl, 2011). Annual commercial harvest of pink salmon in Southeast Alaska is reported by the Alaska Department of Fish and Game (ADF&G) and the Forest Service evaluates these estimates for trends (Figure 4). Commercial harvest is in part a good indicator of annual abundance and potential trends for pink salmon in Southeast Alaska.

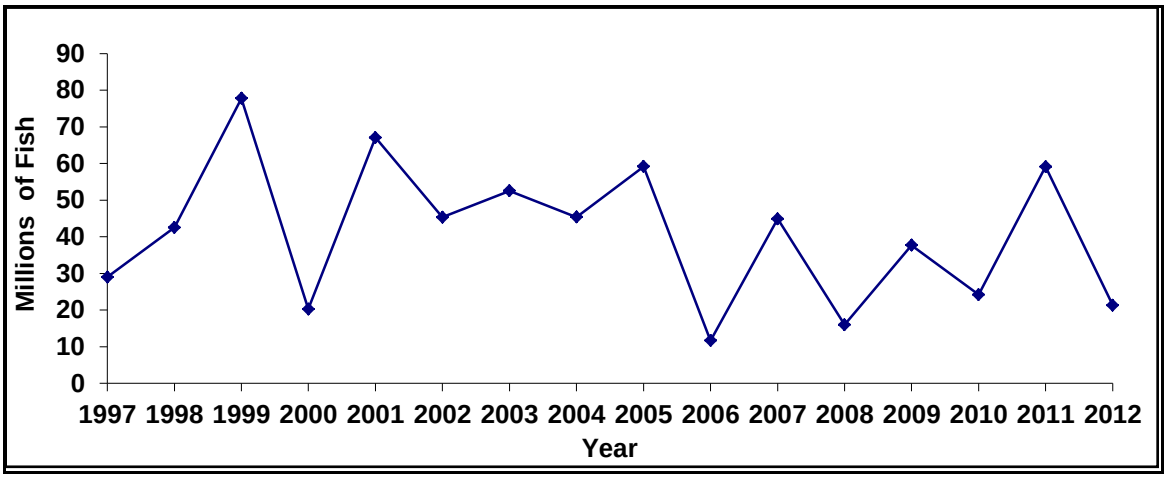
According to ADF&G data, the 2012 estimated Southeast Alaska pink salmon harvest of 21.3 million fish was approximately fifty-four percent of the recent ten year average (2002-2011) of 39.6 million fish, ranking twenty-seventh among harvests since 1962 (Conrad and Davidson, 2012). The 2012 pre-season harvest forecast had been predicted to be in the weak range at seventeen million fish with an eighty percent confidence interval of ten to twenty-nine million (Eggers and Carroll, 2012). That forecast was calculated using both a forecast from the trend of the harvest through exponential smoothing and an adjusted forecast using the 2011 NOAA Fisheries juvenile pink salmon abundance data (Piston and Heinl, 2011). The 2012 harvests were similar to those in 2010 and continue a weak even-year return pattern displayed since 2006.

Another indicator of pink salmon abundance is escapement data based on a series of index streams across Southeast Alaska (Heinl et al, 2008). The reported data is the annual sum of the peak escapement counts for approximately 714 index streams which are surveyed, via small aircraft, throughout the season with data consolidated into 46 active stock groups, representing twelve Management Districts across Southeast Alaska (Figure 5). The highest count observed is used for the index and is considered a relative measure of escapement, useful for tracking trends in escapement and for year-to-year comparisons.

According to ADF&G, the total 2012 pink salmon escapement index of 11.0 million fish ranked eighteenth since 1960 and totaled seventy-five percent of the recent ten year average of 14.7 million fish (ADF&G, 2012). During 2012, two of the three sub-regions (demarcated as Southern Southeast Subregion, Northern Southeast Inside Subregion, and the Northern Southeast Outside Subregion) biological escapement goals were met with the exception being in the Northern Southeast Inside Subregion where the escapement goal was not met. Escapement management targets were met in ten of fifteen districts and for thirty-one of the forty-six stock groups (ADF&G, 2012). Even though the Northern Southeast Inside Subregion harvest of 1.0 million pink salmon was only six percent of the recent ten year average, twelve of twenty-one pink salmon stock groups within this subregion finished up below

management targets. While the southern Southeast subregion escapement indices were met for all seven districts, there were three stock groups that fell below management targets within this subregion.

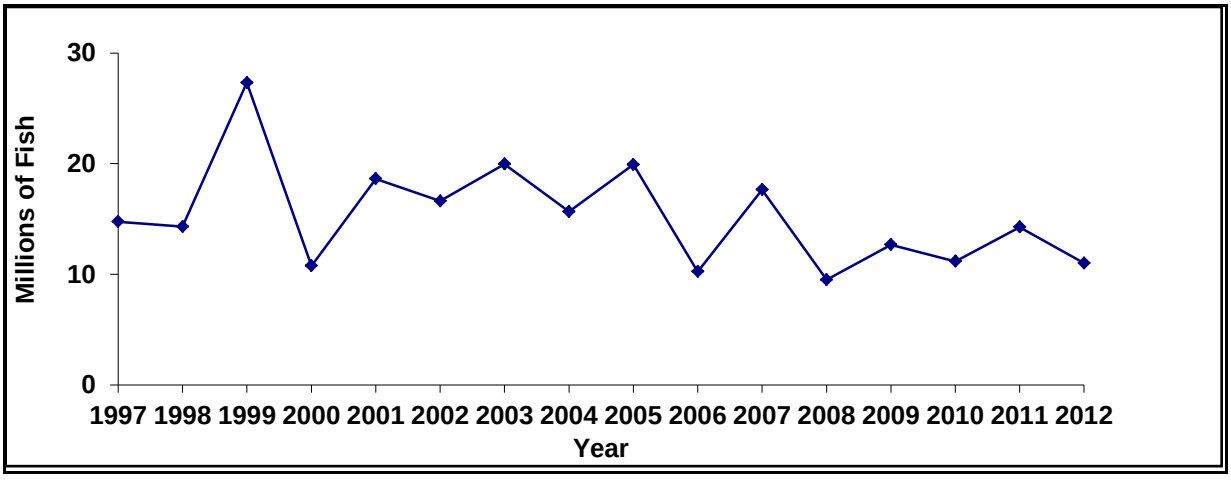
Streams-Fish Habitat 1 Figure 5. Annual commercial harvest of pink salmon in Southeast Alaska from 1997 through 2012. Data provided by ADF&G.



*For additional details, refer to Conrad and Davidson, 2013.

The combination of annual harvest and escapement is generally a good indicator of the annual abundance and potential trends for the pink salmon returning to Southeast Alaska. No consistent trends are apparent in the escapement index data from 1997 through 2012. Much of the reduction in recent years was the result of poor even-year pink salmon returns that began in 2006. Those pink salmon out-migrated in 2005, which was an anomalously warm year in the Gulf and likely affected survival for many salmon species. It is apparent that environmental conditions are constantly changing in different ways, in different areas, making it difficult to predict future trends. According to ADF&G, pink salmon abundance is largely driven by early marine survival rates, thus explaining the dramatic annual variation in the size of pink salmon runs. As defined by the State of Alaska's Policy for Management of Sustainable Salmon Fisheries, no stocks of pink salmon in Southeast Alaska meet the criteria for stocks of concern (Piston and Heinl 2011).

Streams-Fish Habitat 1 Figure 6. Annual escapement of pink salmon in Southeast Alaska from 1997 through 2012. Data provided by ADF&G.



It is generally believed that pink salmon abundance is controlled by several factors including stream freezing and the cyclical productivity of the marine environment. Quality of the freshwater habitat, mainly the infiltration of fine sediment into pink salmon redds, is also important and may be affected by forest management, but is likely overshadowed by the influence of winter freezing and ocean productivity. Short-term trends in the data, for example high abundance in 1999 and extremely poor pink salmon escapement in 2006 and 2008, cannot be attributed to forest management. Commercial harvest of both pink and coho salmon was high in 1999. The synchrony of high commercial harvest of both species suggests a strong influence of ocean productivity on the abundance of these species. In 2004, region-wide cold weather and stream freezing when eggs and fry were incubating in the spawning streams is the likely explanation of the reduced 2006 return of pink salmon followed by low 2008 returns. It appears that the even-year lines have been somewhat improving since 2006, however the 2012 return was still considered to be in the weak range primarily because of those particular poor escapement years.

Evaluation of Results

There have been no pink salmon or pink salmon habitat monitoring efforts conducted during the period 2008-2012. The forest discontinued attempts at framing a monitoring protocol for this species in 2010. A recommendation has been made to drop this species from the Management Indicator list because of the extreme difficulty in being able to detect meaningful level of change as a result of the Forest's current management practices.

The Forest continues to work with ADF&G to review the annual pink salmon commercial harvest and escapement index data for general trend information. The annual average harvest over the past ten years has dropped slightly, primarily due to poor even-year runs since 2006. With the exception of 2008, pink salmon escapement indices have been very close to, within or above escapement goals and escapements appear to have been well-distributed throughout Southeast Alaska. As defined by the Alaska sustainable salmon fisheries policy, no Southeast Alaska pink salmon stocks currently meet the criteria for stocks of concern.

Action Plan

Continue to work with ADF&G to review the annual pink salmon commercial harvest and escapement index data. No changes in the Forest Plan Standards and Guidelines are recommended at this time.

See Fish MIS Summary in the appendices section for more information in response to this monitoring question.

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