Lower Eel River Salmon Parkway and 2018-2019 Fall Chinook Coordination Meeting
Wiyot Tribal Center – September 13, 2018

Attendees: Sal Steinberg (FOVDR), Eric Stockwell, Patrick Higgins (ERRP), David Sopjes, David Wagner, Allan Renger (CDFW), David Kajtuniak (CDFW), Matt Goldsworthy (NMFS), Julie Weeder (NMFS), Emily Maloney (Bear River Tribe), Matt Metheny (Cal Trout), Tim Nelson (Wiyot Tribe), Merritt Perry (City of Fortuna), Sal Chinnici (HRC), Keith Lackey (HRC)

The meeting began shortly after 9 AM and Sal Steinberg welcomed every one and asked those in attendance to introduce themselves.

Rose Foundation Grassroots Grant: After introductions, Sal explained that the Eel River Recovery Project (ERRP) had won a Rose Foundation Grassroots grant to help address salmon habitat problems on the lower Eel River and also to spark interest in a trail along the North Coast Railroad Authority right-of-way. The meeting is also timed so that discussion of the 2018-2019 fall Chinook salmon assessment is also timely. Sal explained his success with previous outdoor education projects like three U.S. Forest Service More Kids in the Woods grants to work with Van Duzen River schools. He is pleased to be able to work with Loleta Elementary School under the Rose grant. Sal explained that Eric Stockwell was monitoring the lower Eel River as part of the grant and also helping with outreach and public education.

Eel River Chinook Salmon 2017-2018 Escapement & 2012-2017 Trends: Patrick Higgins shared handouts (Attachment #1) with charts of fall Chinook salmon escapement trends from 2012-2017, the 2017-2018 run summary, and a map of the Eel River basin showing where Chinook runs are resurgent and where they appear to be declining. Past recounted how ERRP began monitoring Chinook salmon in 2012 after residents expressed concern over population trends and the lack of available data. Dives of the lower Eel River were a principal component of data, while volunteer assisted monitoring basin-wide was based on estimates of migrating salmon and the density and duration of spawning activity. Pat explained that dives were repeatable, but likely biased low. He noted that extended spawn timing indicated successive runs of fish. The 2017-2018 Chinook salmon run had a slow start (2,000-5,000 fish), a moderately strong second pulse (10,000-12,500) and a weak late run (3,000-5,000) for a total of 15,000-22,500 total fish. This represented a down-trend from the previous year and Pat attributed the lower escapement to linger effects on year classes in the ocean from the El Nino in 2015 and low flows in spring in 2013, 2014 and 2015 that may have allowed effective pikeminnow predation.

Run trends from 2012-2017 been in the range of 10,000 to 50,000 Chinook salmon annually, similar to runs measured by U.S. Fish and Wildlife Service from 1955-1958. Pat noted the utility of their redd density maps and said that many areas in the Eel River basin were back to their spawner carrying capacity, like the Middle Fork Eel River basin. However, he pointed out the lower South Fork Eel was diminished in its ability to produce Chinook versus the 1950s (down by 3500 fish) and that upper Eel River basin above Dos Rios was also showing signs of ecological stress. He noted that Tomki Creek was attracting 3,500-5,000 spawners from 1985-1988 and only dozens or hundreds in recent years, when there were tens of thousands of Chinook in the basin. Pat noted that dives were being phased out because of the lack of pools in the lower Eel River and persistent problems with water quality and swimmer's itch that put divers at risk.

Current Lower Eel River Habitat Conditions: Eric Stockwell said he had been tracking salmon runs since he was in his 20s. The estuary is too brackish, so he tended to pay more attention once fish had moved up out of the estuary. Eric talked about participation in the ERRP lower Eel River dives, but noted that use of stand-up paddle boards (SUP) was proving more effective than diving especially in very shallow pools. David Sopjes offered that counts in the 12th Street Pool were feasible as well.

Eric gave a Power Point presentation next about the conditions of the lower Eel River. He noted that conditions were dire as a result of a change in the river bed configuration. Whereas there were formerly six or eight pools in the lower Eel River where adult salmon could hold, instead only the 12th Street Pool at River Lodge remains. The main Eel River channel downstream of the 12th Street Pool has shifted to the west making the Boxcar and Drake Pools unavailable for salmon holding. This means that the salmon must run all the way from the Fulmore Pool below Fernbridge to the 12th Street Pool to find shelter once leaving the estuary. The riffle complex in the intervening three miles, much of which is less than a foot deep.

He next discussed patterns of lower Eel River filling during the drought from 2013-2015. Some pools like the Worswick, immediately upstream of Fernbridge, had dropped from 6-8 feet deep to 3-4 feet deep. In 2015, Chinook that moved up with tides in late October got eye flukes as they sat in the shallow, algae infested pool.

Instead of scouring as a result of the 2016-2017 high water, as many interior reaches of the Eel River had done, the lower river filled in more. Eric said he personally wanted to see the channel manipulated with heavy equipment on an emergency basis, otherwise fish will strand. Pat Higgins said that fish were timed to spawn in the first week in November and that without rain they would run upstream and strand at that time. He said there was documented evidence of at least several dozen fish stranding like that on November 2, 2002.

Sal Chinnici asked about the ability of gravel mining to be done differently so it was helping promote fish passage. Eric noted success in preventing stranding on the lower Van Duzen River due to collaboration of agencies. He asked suggested such a berm system on the lower Eel River could be used. Sal Steinberg noted that when he and Eric floated the lower river that side channels were being dug instead that could be problematic for fish.

Matt Goldsworthy of the National Marine Fisheries Service stated that the lower Van Duzen River stranding solution took outside-the-box thinking and also some trial and error. He said that the lower Eel River had always naturally meandered and so channel change was natural. Matt also said that any manipulation of the lower Eel River channel would require permits from agencies with multiple jurisdictions and obligations. Shore-bird gravel bar nesting habitat, bank swallows, and yellow-legged frogs all must be considered in any management activity.

Fortuna City Manager Merritt Perry asked whether there was a plan to follow for restoring salmon habitat in the lower Eel River. Eric said the solution was gravel extraction. Pat Higgins offered that forcing the river current using bioengineering should be considered so that the river channel tended to maintain itself.

History of Lower Eel River Channel Change: Retired Ferndale High School teacher David Sopjes has been getting advanced GIS training at Humboldt State University and applying his new skill set to tracking channel change on the lower Eel River. Dave showed a Power Point slide show that used historical aerial images by the first surveyors, aerial photos and LIDAR data to show how the channel has widened and migrated.

The Eel River channel was historically narrower and deeper but it has been filled by flood debris and profoundly changed. Channel changes after the 1955 and 1964 floods was evident, but the levees installed after the latter have shaped the river ever since. Pools tend to form around armored banks, such as the 12th Street Pools and the Boxcar Pool just downstream. The most problematic reach is just above Fernbridge where the point bar on the east side of the river has been building up according to LIDAR imagery. This has forced the lower Eel River to the west and the bank at the Worswick Pool above Fernbridge has move 600 feet as the bank eroded, including the loss of valuable pasture land and a cottonwood gallery forest. This bank failure also threatens the western approach to Fernbridge and necessitated emergency repairs by CalTrans in 2017. Given the hard points in the lower river and lack of other large wood or roack to create habitat diversity, it does not appear the river will be able to heal itself with regard to providing Chinook salmon habitat without human intervention.

Planning for 2018-2019 Fall Chinook Salmon Run Assessment: Eric Stockwell talked about the history of ERRP dives with opportunity to dive in eight pools or deep runs in 2012 and now only the 12th Street Pool exists. Also, swimmer's itch or even risk of exposure to algal toxins also threaten diver health and safety if flows do not come up enough to freshen water quality. Also, shallow pools put the fish in constant bright light during the day and they are also subject to stress from sport anglers before October 1. Dives constitute potential, additional accumulated stress for holding Chinook salmon that is undesirable. Finally, dives are impossible to plan because conditions may never be suitable in some years, with stagnant water replaced by high turbid flows when rains finally arrive. Therefore, ERRP will not be organizing dives in the lower Eel River below Fortuna in the 2018-2019 season. Pat Higgins said dives further upstream could still be useful if the fish mass migrate and then stage in pools (i.e. Dos Rios).

Since 2015, Eric Stockwell and Dave Sopjes have perfected the use of stand-up paddle boards (SUP) and kayaks to estimate the number of holding Chinook salmon in lower Eel River pools. Eric suggested that partners might purchase similar equipment and augment lower river teams and possibly employ them in pools further up river.

In addition, drones are now a significant secondary tool for estimating holding Chinook salmon. Drone imagery captured in 2017 in the Drake Pool was of sufficient resolution to distinguish species, with a green sturgeon sitting with the salmon, and also between jack salmon and adult salmon. However, there are many complexities to obtaining good drone imagery: permitting drone operation, lighting, wind, and water clarity. Therefore, use of drones is invaluable but the tool should not be the sole means used for fish population estimation.

Dave Kajtaniak of the California Department of Fish and Wildlife (CDFW) and Matt Metheny of Caltrout then added that they both had grant funding for operation of dual frequency radar

devices (DIDSONs) that will be deployed to count salmon. Matt will operate a DIDSON on the lower South Fork Eel River while Dave will be on the main Eel River just upstream of Dyerville. Matt noted the problem distinguishing between Chinook salmon, coho and steelhead and said he would be grateful for any information from lower river surveys that might have bearing (i.e. observation of coho and steelhead intermixed with Chinook). Pat Higgins offered that anglers can be a useful means for detecting the level of coho presence. Guides have indicated high coho catch-rates in the estuary when trolling for Chinook in some years. Also, bank anglers noted high catch rates of coho during clear water periods on December of last year. Pat said he would share any such information he received and Matt said he would also be cultivating sport fishermen as a source of information.

Fish Emergency Scenarios: Sal Steinberg asked Allan Renger from CDFW to talk about response to a potential fish stranding or fish disease outbreak, and whether there was any role anticipated for ERRP volunteers. Sal noted that there was potential in the lower Eel River to have a mass stranding, similar to 2002 on the lower Van Duzen River.

Allan Renger, who is the lead fish biologist for CDFW in the Eel River, provided information about Department response to fish kills. His office in Fortuna would be the first responders, but staff from Region 1 in Redding and Sacramento would be alerted and could join in any necessary activities. There are contingency plans for such events at both levels.

With regard to fish disease, Allan talked about how he was part of a team responding to a mass die-off of carp in Lake Mendocino. The first task in a disease-induced fish kill is to identify the pathogen. He said that when a problem is observed, such as Chinook salmon in the lower Eel River by Eric Stockwell in 2015, CDFW must obtain clearance from NMFS in order to handle diseased fish. After NMFS authorization was issued on an emergency basis, Allan was able to delegate staff and employ ERRP volunteers to capture fish and ship them to UC Davis. UC Davis scientists detected that the pathogen in that case was an eye fluke, and the fish were further compromised by a virus as the fluke development within the eye advanced. This made the fish particularly docile and easy to capture, which Allan noted was not typically the case. Use of deceased fish for laboratory analysis can be problematic, so live fish must be captured for a good assessment. He recommended that ERRP or other citizens supply good photographs of fish condition, which can be very useful in early detection of disease outbreaks.

Matt Goldsworthy of NMFS talked about the Klamath fish disease protocols that have developed after the massive disease-related fish kill there in 2002. Agencies and Tribes sample juvenile fish constantly for rates of *Ceratomyxa shasta* infection and adult fish for the gill disease Ich. If high disease rates are noted, pulse flows are requested from the Trinity River. Allan Renger said that the Eel River did not have the disease problems of the Klamath River and that the volumes of water available for flow manipulation were very small in the Eel basin.

Next Allan addressed the problem of fish stranding. He was part of the rescue team at the mouth of the Van Duzen at the time of the mass stranding of Chinook salmon, which was right after her arrived in Fortuna. His team was only able to save 17 of an estimated 200 adult Chinook salmon. Allan doesn't believe that there is any intervention for saving fish in the lower Eel

River, if they strand. He said he would consult with NMFS in the event of a stranding and discuss feasibility of options, but shared no specifics in terms of contingency planning. He noted that sparse early season rains could precipitate stranding as fish are attracted by slight increase in flow that is not enough to provide depth in riffles sufficient for passage. Pat Higgins added that tidal flux can also draw fish upstream before flushing flows, as in 2015. Dave Sopjes added that non-native snails in the algae were likely intermediate hosts to the parasite and their abundance seems to fluctuate with flow years.

Pulse flows as a solution was touched on. Allan has concern that there is not enough water available from the Potter Valley Project (PVP) and Pillsbury Reservoir to assist with lower Eel River Chinook salmon passage. He expressed concern that raising flows enough to induce fish entry, but not enough for passage could lead to concentrations of fish just upstream and make them vulnerable to poaching. Pat Higgins noted that the 2500 acre-feet (AF) currently allocated for "block water" for the fish, as a result of NMFS intervention in re-licensing after coho listing, can only elevate flows by 100c fs for 10 days. If block water were elevated to 7500 AF, then a month of elevated flows would be afforded, which would be sufficient for fish to pass well upstream of Dyerville. However, Pat added that release of block water from Lake Pillsbury in response to fish stranding would be ineffective without planning because it takes several days to reach the estuary. Allan noted that PVP stakeholders had opted for using block water in spring to induce Chinook salmon juvenile migration.

Eric Stockwell and Sal Chinnici asked why the lower Eel River channel cannot be excavated on an emergency basis given the potential for a fish kill in 2018. Sal also said that signs should be employed to let people know that holding fish should not be molested. He noted that HRC gravel mining was impeded by yellow-legged frog concerns, but wondered if permitting could be waived if gravel excavation was in response to a fish emergency. Neither CDFW or NMFS seemed receptive to emergency action at this time. Matt Goldsworthy said that in the longer term that driving pilings in the lower Eel River or use of very large rocks are needed to create pools and to shape the river channel. Eric Stockwell noted that large wood naturally played that role.

Humboldt Area Foundation (HAF) Grant: Pat Higgins noted that ERRP had requested grant assistance from HAF for the Lower Eel River Salmon Parkway concept. This grant has a similar emphasis to the Rose Grassroots grant, 1) to educate the public and students, 2) to stimulate creation of a trail on the NCRA right of way from the Van Duzen River to Fernbridge, and 3) to helping with lower Eel River salmon habitat restoration planning. Pat noted that ERRP had been a silent witness since 2012 to almost annual threats of a large-scale Chinook salmon fish kill, and that the grant resources being obtained were could help improve conditions for Chinook salmon and also improve local quality of life.

While emergency measures, such as the methods employed on the lower Van Duzen River to avoid Chinook stranding may be necessary in the short term, ERRP favors large scale manipulation of the lower Eel River, similar to that employed at the foot of School Road in McKinleyville on the lower Mad River. BioEngineering Associates (BE) out of Laytonville worked on a 1500-foot-long, 50-foot vertical cut-bank and turned it into a willow wall with

excellent fish habitat elements. This technology needs to be employed at the Worswick Pool, where the Miranda family who owns the property has been requesting assistance from the Humboldt County Resource Conservation District for more than a decade.

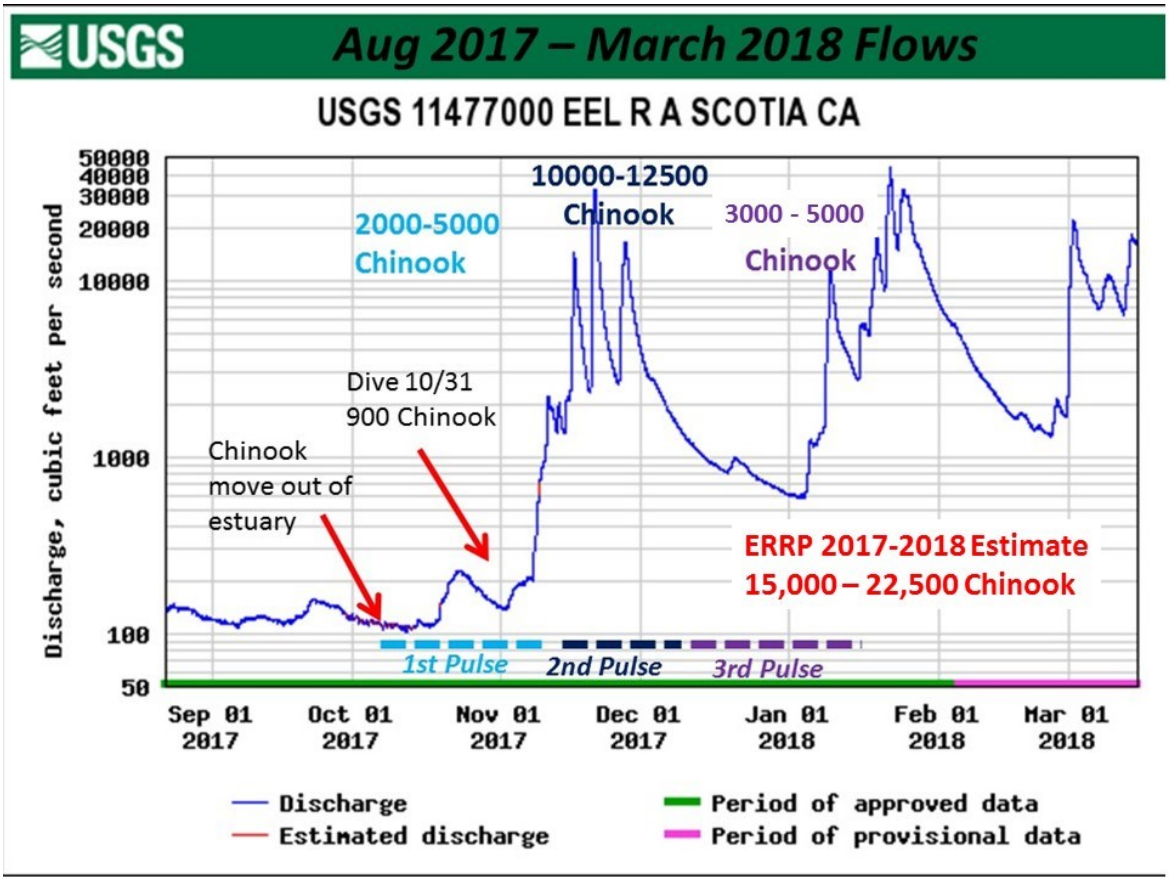
Pat noted that CalTrans emergency project to fortify the abutments on the west side of Fernbridge was supposed to be mitigated, but that the agency was overwhelmed as a result of the threat to Highway 101 by landslides south of Crescent City. He said that Caltrans should ultimately assist financially in lower Eel River restoration. Although the bank at the Worswick Pool could be stabilized using a strategic amount of large rock and masses of living willow, Pat noted that BE also had experience in recontouring channels, such as at the Asti Winery on the Russian River. He thought moving the channel towards the east and re-connecting the Creamery Pool should be considered. Pat also recommended that using rock and willow baffles to block side channels might also be employed to funnel energy into one channel that would more likely maintain pools and passage. If the HAF grant funds, a committee of experts and agency and Tribal staff with be convened to study salmon habitat improvement solutions, and Pat will write up their findings as a plan.

ERRP has witnessed extensive poaching along the NCRA right of way at the Boxcar Pool, which was highly undesirable because it was taking place in one of the few holding pools and was causing fish stress as well as mortality. The Lower Eel River Salmon Parkway trail would alleviate this problem and provide a huge amenity to the City of Fortuna. ERRP is only a catalyst in this effort, with the City of Fortuna and Redwood Community Action Agency ultimately responsible for carrying out the project. Under the HAF grant a public meeting and several meetings with trail experts and stakeholders will be held. Sal Steinberg and Eric Stockwell would expand their school and public education efforts as well.

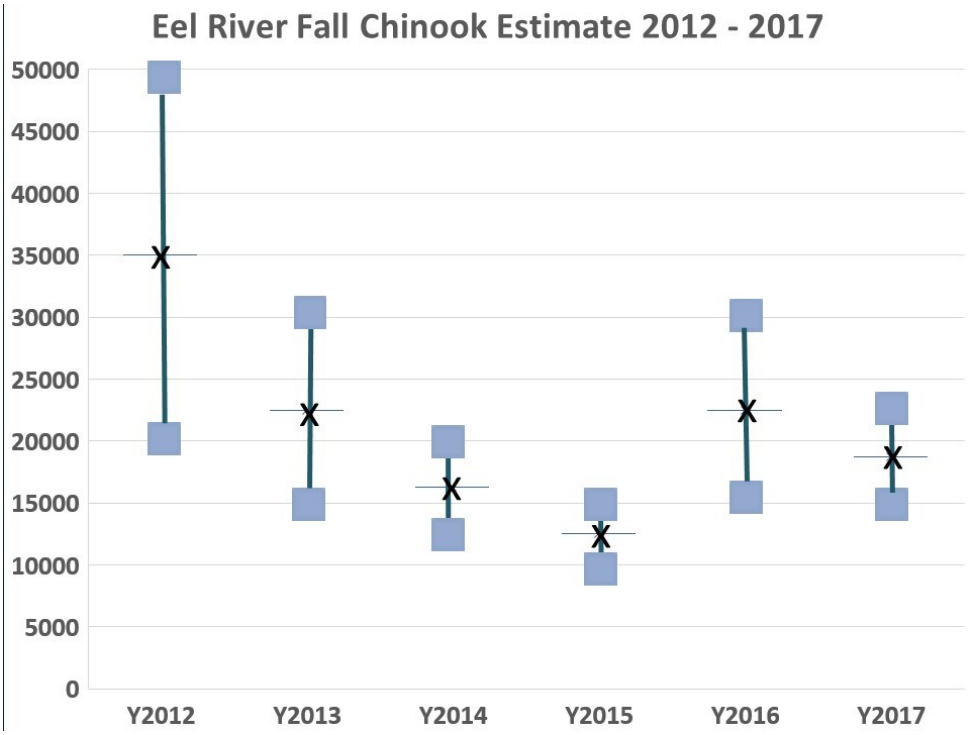
Merritt Perry said that the City of Fortuna is on-board. The City needs to connect more to the river and he can make staff or equipment available, if there is a plan. He said there is widespread support for a trial to get the community more connected to the Eel River again and to carry out a trails master plan that includes a Strongs Creek trail and the John Campbell trail that links to Headwaters Forest. Merritt was open to working with RCAA and is planning on seeking grants and would like a letter of support from ERRP. He said trail maintenance is an issue, but grant funds can be obtained, or other means of supporting it arranged.

Next Meeting: Sal Steinberg asked the group if they would like to meet again in a month, since the problem might be even more acute by then. Wednesday, October 17 was chosen for the follow up meeting and Tim Nelson said the Wiyot Tribe was again willing to host. Julie Weeder of NMFS said she would like to present ideas about grant opportunities at that meeting.

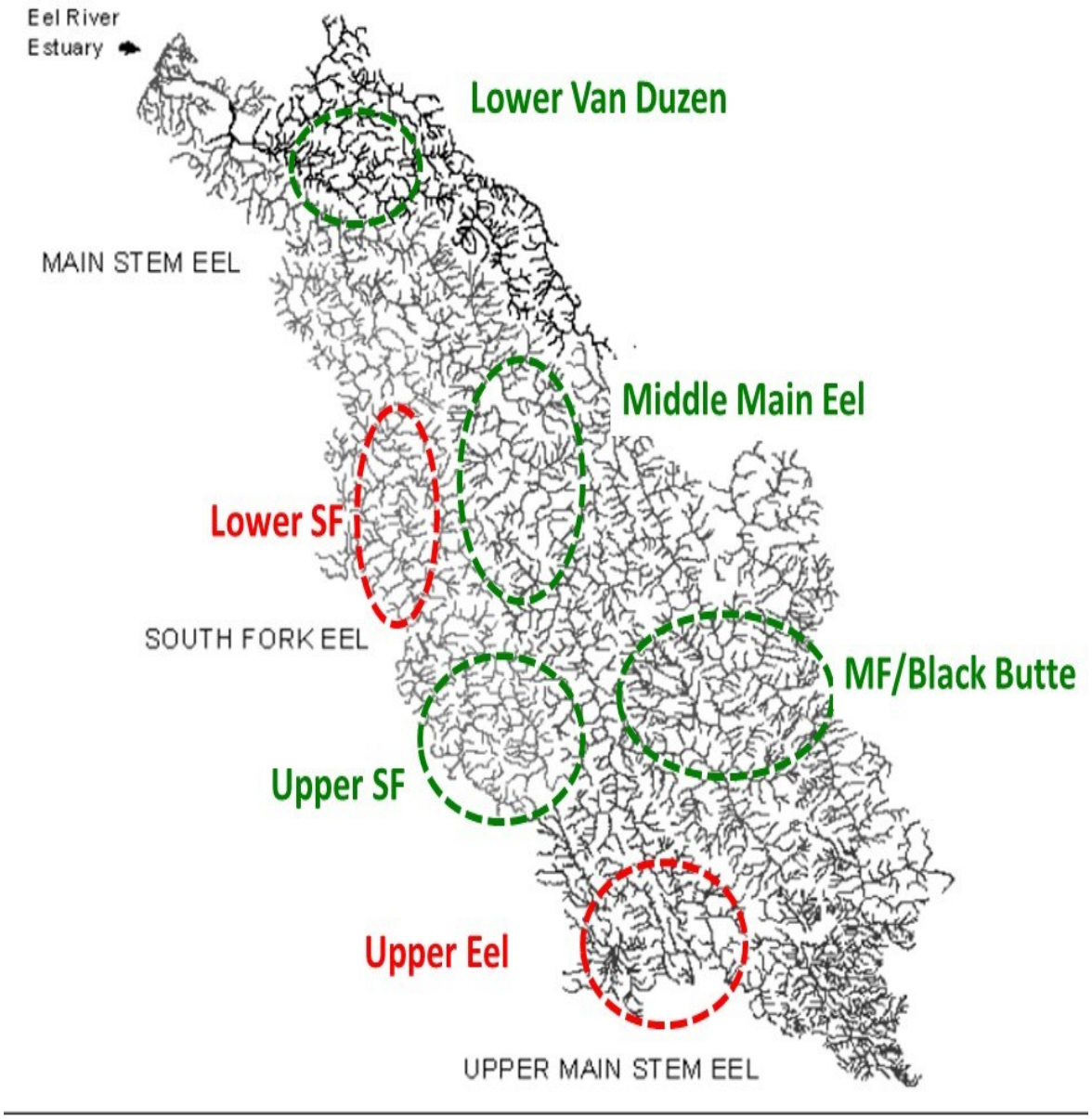
The meeting was adjourned at 11:20 AM.



ERRP 2017-2018 Chinook Salmon Run Estimate Over-laid on USGS Scotia Flow Chart



ERRP Summary of 2012-2017 Run Trends



Green area highlights indicate Chinook salmon habitat in recovery and likely approaching productivity similar to USFWS 1955-1958 counts. Lower South Fork and Upper Eel River appear to be losing Chinook salmon productivity.