February, 5 2015

Humboldt County Board of Supervisors
825 Fifth Street, Room 111
Eureka, CA, 95521

Dear Supervisors,

I am a recent graduate from Humboldt State University and received a Bachelors of Science degree in Natural Resource Planning. Over the course of my schooling I have taken particular interest in our county's salmonid populations. A portion of my senior project included researching the impacts climate change and sea level rise will have on coho salmon in Humboldt Bay. After spending many hours researching Northern California salmonids and projected impacts from climate change, I am concerned about the survival of sensitive aquatic species such as the coho salmon. I believe that the coho salmon must be protected and carefully monitored in order to ensure that population levels do not further decline. In consideration of the new Final Recovery Plan for the Southern Oregon/Northern California (SONC) coho salmon, I hereby submit my comments and recommendations on the Water Resource Element of the General Plan Update in regards to its consistency with protecting coho salmon populations.

The Final Recovery Plan for the SONC coho salmon was recently developed by NOAA Fisheries, outlining the current status of each region's population and describing the relevant threats and stressors impacting each individual population. The overall goal of the Final Recovery Plan is to create salmonid populations that are natural and self-sustaining, which no longer require federal or state protection. In order to be considered a recovered Evolutionary Significant Unit (ESU), populations must achieve sufficient abundance, growth rates, spatial structure, and diversity (NMFS, 2014). The Plan outlines recovery strategies and actions that will lead to restored habitats and a reduction in threats and stressors to help populations return to sufficient levels for natural persistence.

The Southern Oregon/Northern California coho salmon is a federally endangered species and is struggling to return to stable population levels due to the reduced water quantities in the dry season, unstable temperatures, and the turbidity/quality of water. The most influential stressors for coho populations within Humboldt County include: impaired water quality, degraded riparian forest conditions, altered sediment supply, altered hydrologic function and impaired estuary function (NMFS, 2014). In order to increase the number of coho salmon within our region, the Water Resource Element must focus on erosion/sedimentation control, restoration of riparian habitats, and securing a mandatory amount of water to be released during low flow periods.

The Water Resource Element of the General Plan has incorporated goals, policies and programs that consider threatened and endangered fish species, including the coho salmon. I support the following policies and believe if implemented in a timely matter and adequately enforced that these policies will work towards improving conditions for sensitive aquatic species like the coho salmon.

- (WR-G8) Restoration of Impacted River Flows
- (WR-P36) Erosion and Sediment Control Measures
- (WR-IM8) Watershed Planning

However the Water Resource Element has failed to address a few key issues that influence the health and viability of the coho salmon. First, climate change is a relatively new issue that deserves attention especially when planning for salmonid species. Climate change is expected to detrimentally affect SONC coho salmon in freshwater, estuarine and oceanic habitats. For example, Northern California is projected to experience a shift in precipitation levels, earlier snowmelts with decreased summer flows, and intensifying storms that will increase peak flows due to climate change (NMFS, 2014). In addition, ocean acidification caused by climate change is predicted to reduce ocean productivity for salmonid species and increasing sea levels will likely inundate and alter critical estuarine habitats (NMFS, 2014). The coho salmon is particularly vulnerable to climate change impacts due to an extended rearing period in freshwater habitats, which is vital for juvenile development. An extended rearing period means that coho salmon reside in estuary habitats for a longer period of time then other salmonids, thereby requiring year round cool water temperatures. The rearing habitats where young coho salmon currently reside are already near the upper limits of their thermal tolerance (NMFS, 2014). In addition, continuing drought conditions will exacerbate the current high water temperature and low flow levels. As climate change is predicted to increase water temperatures, critical habitats will be affected; therefore the fate of the SONC coho salmon is uncertain.

I recommend that certain policies within the Water Resource Element should be revised and include language that addresses climate change. For example, policy **(WR-P5) Critical Watershed Areas** designates all or portions of watersheds as "Critical Watersheds" if cumulative impacts from existing or planned land and water uses has the potential to create significant impacts to the environment. First, this policy does not list criteria in how the county will determine critical watershed and water supply regions. Also, this policy should also consider the future impacts from climate change and how this added stressor may contribute to cumulative impacts. Since climate change is expected to negatively impact the coho salmon and other salmonid species, I believe that this policy should expand its language to include all estuary habitats and regions susceptible to the impacts from climate change as

"Critical Watersheds." Supporting measures such as (WR-IM1) and (WR-IM2) should also consider future impacts from climate change when developing the critical water supply and watershed areas ordinance and when identifying and designating critical water supply and watershed areas. Although the expansion of language to include climate change will not change the fact that climate change will affect our streams, rivers and estuaries, the expansion can ensure that threatened and endangered fish species that reside in these vulnerable areas will experience less human induced stressors.

Policy **(WR-Px1) Requirements for Water Storage in Impaired Watersheds** requires that new development proposed within impaired watersheds that are not served by public water that seeks to rely on surface water shall install water storage tanks capable of providing 100 percent of the Department of Fish and Wildlife recommended water storage volume and enter into a agreement that eliminated water withdrawal during low-flow conditions. This policy is essential to mitigate the impacts of future development on aquatic species, but the County has failed to enforce current regulations on existing development from illegal grading, and water diversion, which has resulted in ongoing impacts to the Mattole, Eel and other vulnerable watersheds. In order to ensure that watersheds retain their health and function for the future generations of coho salmon and other salmonid species, all currently existing development within at risk areas must be compliant within these guidelines. Current conditions within the watershed are in poor health due to already existing development water usage and land management. Therefore we must correct this issue by regulating all current and future development within vulnerable watersheds. In addition, I believe that in order to successfully ensure the protection of critical watersheds, some type of monitoring program should be set in place and enforced.

In addition there are several implementation measures that, if executed in a timely matter, would result in protection of water quality and quantity. These measure include:

- **(WR-IM10) TMDL Controllable Sediment Discharge Inventory & Reduction Program**
- **(WR-IM21) Long-term Water Supply Planning**
- **(WR-IM26) Low Impact Development Methods**

In order for these measures to effectively protect water quality and quantity, a strict timeline must be established. Without a timeline these measures could take many years to be developed and implemented; therefore impacts may not truly be mitigated. I strongly recommend developing a timeline for the above measures to ensure that mitigation will be carried out. For example, **(WR_IM10) TMDL Controllable Sediment Discharge Inventory & Reduction Program** aims to map impaired water bodies as defined under Section (303d) of the Clean Water Act with associated impairment parameters, water quality objectives, and pollution budgets contained in TMDL implementation plans. Data collection and map development

will take a significant amount of time and work despite the efforts of the program which aims to help limit further degradation of water bodies. In addition, this measure calls to establish a program to prioritize, treat, monitor, and subsequently reevaluate controllable sediment discharge sites, which also requires a significant amount of work, time and resources. This measure has the right intentions, yet a timeline must be developed to secure mitigation efforts within a reasonable timeframe. I support the intentions of the aforementioned measures; however, if they are not implemented within a reasonable timeframe then they will prove to be less effective, thereby potentially contributing to the decline of coho salmon populations.

Under California's Environmental Quality Act:

- § 15126.4. Consideration and Discussion of Mitigation Measures Proposed to Minimize Significant Impacts

Measures (B) states, "formulation of mitigation measures should not be deferred until some future time" (CEQA Amendment). This measure declares that adopted mitigation actions should take place within a reasonable time to ensure that significant impacts will be reduced to less then significant. The Department of Fish and Wildlife also supports the inclusion of timelines within implementation measures, recommending that the County require "specific timeframes, resources, and personnel needed complete tasks, and define terms used so that the goals and polices for which the implementation measures are designed to achieve can be reached in the 20-year planning horizon of the Update," (Department of Fish and Wildlife, 2009).

Overall, the Water Resource Element has the right intentions as it is working towards protecting salmonid species and their critical habitat. However, I believe the Board of Supervisors needs to include language with regard to climate change and focus on attaching timelines to certain measures to ensure mitigation happens.

I appreciate your time and I hope you take my thoughts and comments into consideration.

Sincerely,
Zoe van Duivenbode
Zdv1@humboldt.edu

References:

Department of Fish and Wildlife. (2009). Humboldt County General Water Resource Element.

Humboldt County Planning Commisson. (2012). Humboldt County General Plan Update: Draft Environmental Impact Report.

National Marine Fisheries Service. 2014. Final Recovery Plan for the Southern Oregon/Northern California Coast Evolutionarily Significant Unit of Coho Salmon (*Oncorhynchus kisutch*). National Marine Fisheries Service. Arcata, CA.