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Re: Humboldt Wind Generation Project



Humboldt County Planning Commission
3015 "H" Street
Eureka CA 95501

BACKGROUND

Electromagnetic Field (EMF) is comprised an electrical and a magnetic field perpendicular to each other which travel together in an invisible wave form. This can occur near an electrical current [1]. Safety of EMF exposure is related to:

- Frequency – Higher frequencies carry more energy and are more dangerous.
- Power Density – The average energy in a given area.
- Strength – Electric and magnetic fields present.
- Duration of Exposure – Longer duration is worse.

HIGHLIGHTS

Electrofishing is a common scientific survey method used to determine abundance, density, and species composition. This method has been used since the 1950's. When performed correctly, electrofishing results with no permanent damage to the fish. When DC current is used the stunned fish is attracted to the anode probe (negatively charged) and undergoes temporary muscular convulsions. AC current can attract fish to either probe. Conductivity influences the effectiveness of electro fishing. It can cause injury to the fish by creating muscle spasms that damage the vertebrae. This is more common in severe and larger fish (larger surface area)[2].

The Eel River is home to several species of anadromous fish. The fall-run California Coast Chinook, salmon (*Oncorhynchus tshawytscha*), The Southern Oregon Northern California Coho salmon (*O. kisutch*) and the winter-run and summer-run North California Coast steelhead (*O. mykiss*) are currently listed as threatened under the Federal Endangered Species Act. National Marine Fisheries Service has identified that current population abundance is trending downward (NMFS 2011). The Southern Oregon Northern California Coho salmon is also California listed as threatened.

By installing high voltage crossings whether aerial or subsurface it has been demonstrated that migration patterns of these federally listed species could be altered. The US Department of Interior, US Department of Energy and the Bureau of Ocean Energy Management has done research on the assessment of potential impact of electromagnetic fields from undersea cables on migratory fish. This study showed that migration patterns were altered I both juvenile chinook smelts and adult returning spawners in San Francisco Bay.

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A study by scientists at Oregon State University funded by Oregon Sea Grant and the Oregon Department of Fish and Wildlife showed the juvenile Chinook salmon could have their migration patterns altered by altering the magnetic field that they swim in.

SUMMARY

Electromagnetic fields have demonstrated to alter fish navigation and could pose a barrier to migrating fish (electric fish weir at Mad River and Prairie Creek Fish Hatcheries). The high voltage crossings on the Eel River associated with the Humboldt Wind Generation Project can potentially have a devastating effect on these federally listed anadromous salmonids. This has not been addressed in the draft EIR. Until this is addressed by the federal and state permitting agencies, I respectfully ask the Humboldt County Planning Commission to support the no build alternative.

Respectfully,

David L. Chang

[1] Hidden EMF Dangers and How to Mitigate Them – Brian Hoer, Geobiologist

[2] Electrofishing – Induced Spinal Injury on Long Term Growth and Survival of Wild Rainbow Trout – North American Journal of Fisheries Management 16 (3): 560-569.

REFERENCES

Fishery Research – Electrofishing National Park Service US Department of the Interior

Electrofishing – US Fish and Wildlife Service

Current Biology Journal, Vol 4, Issue 4, 47-452 – Nathan Putman, David Noakes

An Inherited Magnetic Map Guides Ocean Navigation in Juvenile Pacific Salmon – Steven R. Dalbey, Thomas E. McMahan, Wade Fredenberg (1 August 1996)

Effects of EMFs From Undersea Power Cables on Elasmobranchs and Other Marine Species – Normandeau Associates, Inc. and Exponent Inc., Dr. Tim Tricas, Dr. Andrew Gill – Prepared under DOE Award: DE-EE00063082 – BOEM Publication Number: OCS Study BOEM 2016-041

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(Cont.)