

Is the level of dissolved oxygen in the Russian Riversuitable for keystone species like Coho Salmon?

Introduction and background

The general problem our research investigated was the impact of dissolved oxygen on Coho Salmon in the Russian River, Laguna De Santa Rosa and Santa Rosa Creek. Our sources reveal that oxygen is vital for Coho Salmon and low dissolved oxygen levels can inhibit growth and development from different life stages including reproductive abilities. In extreme cases low dissolved oxygen levels can prove to be fatal for Coho Salmon. (Carter, 2005)

Research methods

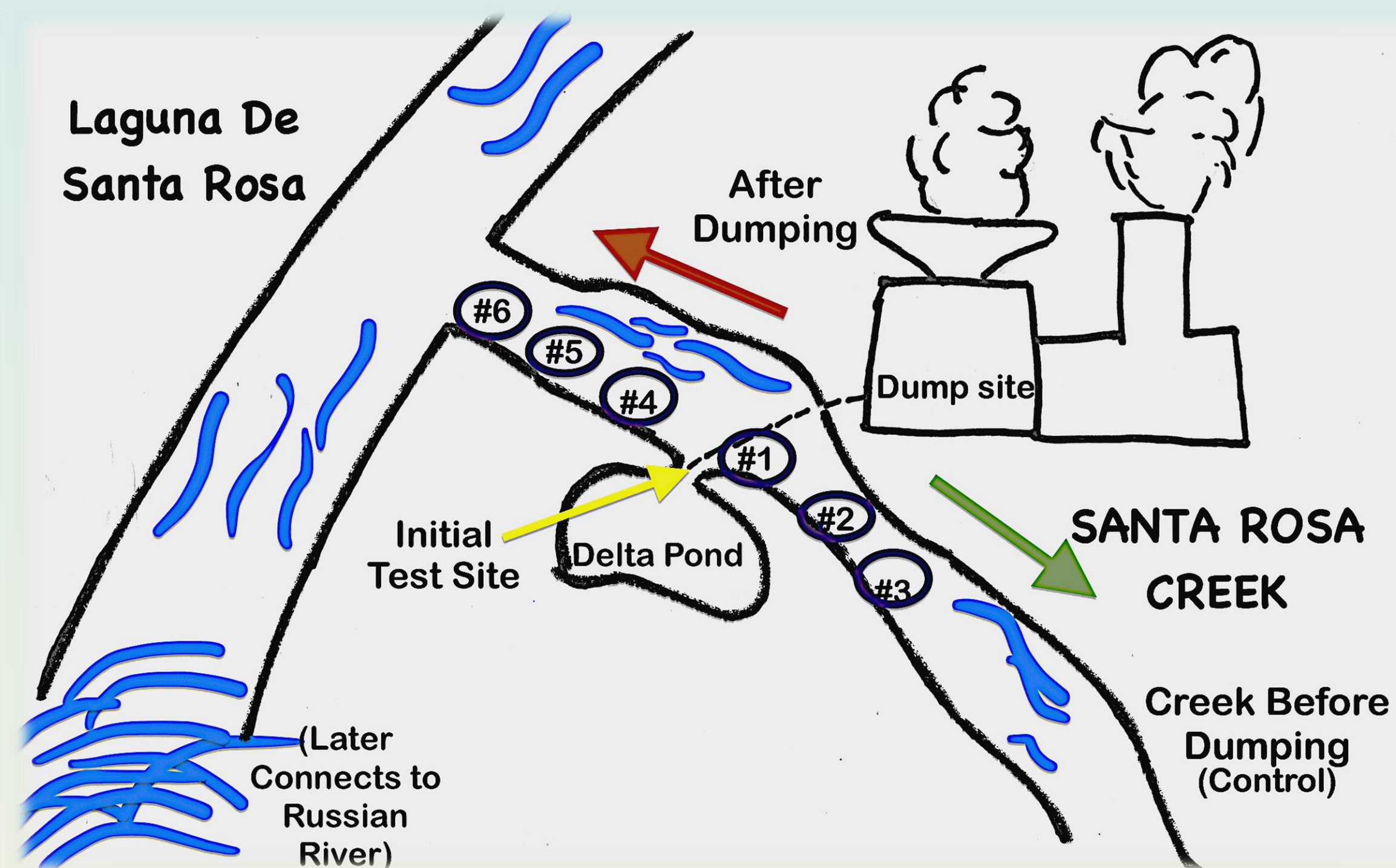


Figure 1:
Clean Water =
Reclaimed Water =
Initial Test Site =
Test Locations =

In order to accurately find the effects on Coho Salmon of discharging reclaimed water; our main research method consisted of testing DO levels and turbidity in 6 different locations, 3 locations due east and 3 locations due west, every 20 meters with 3 trials at each site.

Results

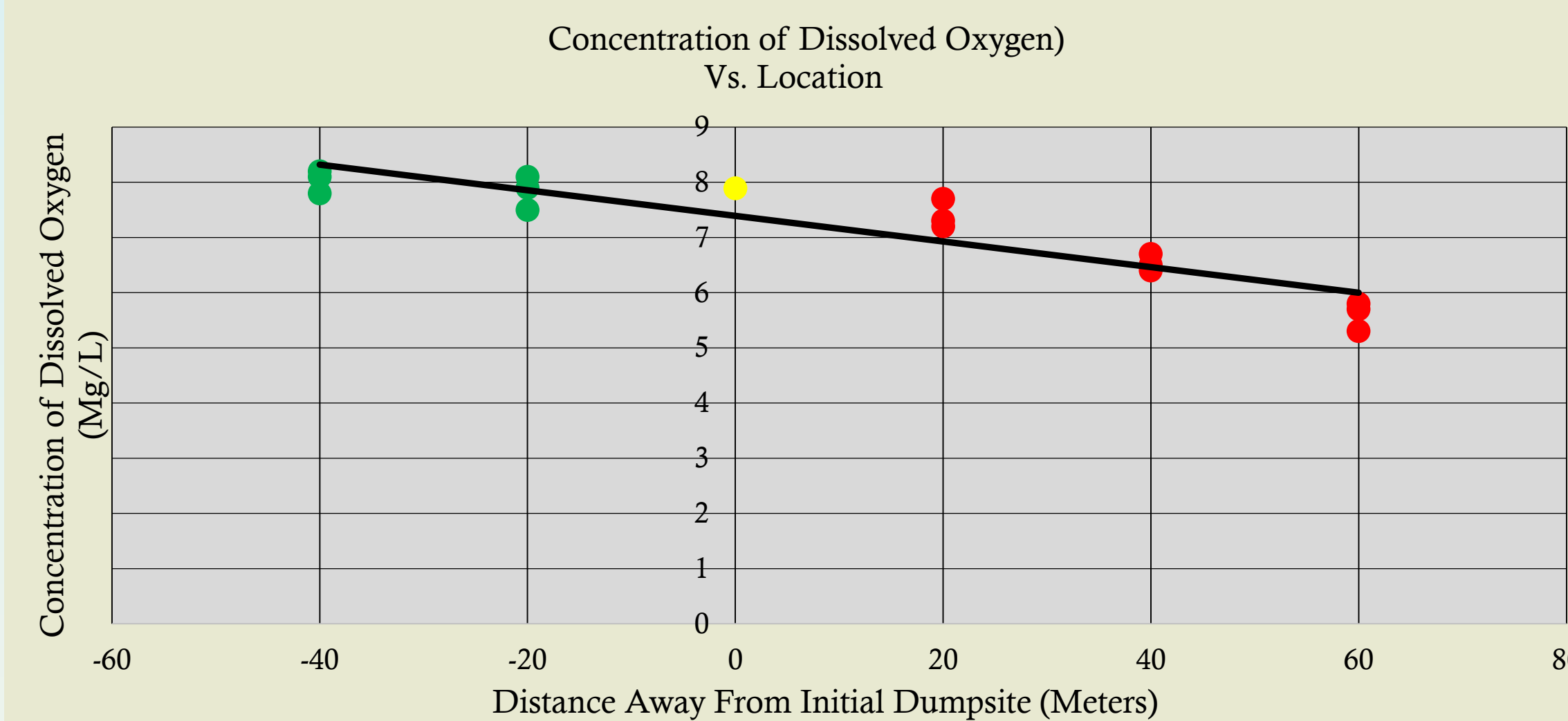


Figure 2: Left is distance before discharge and right is distance after discharge; Study suggests higher DO levels correlate with areas of the river with a history of discharges.

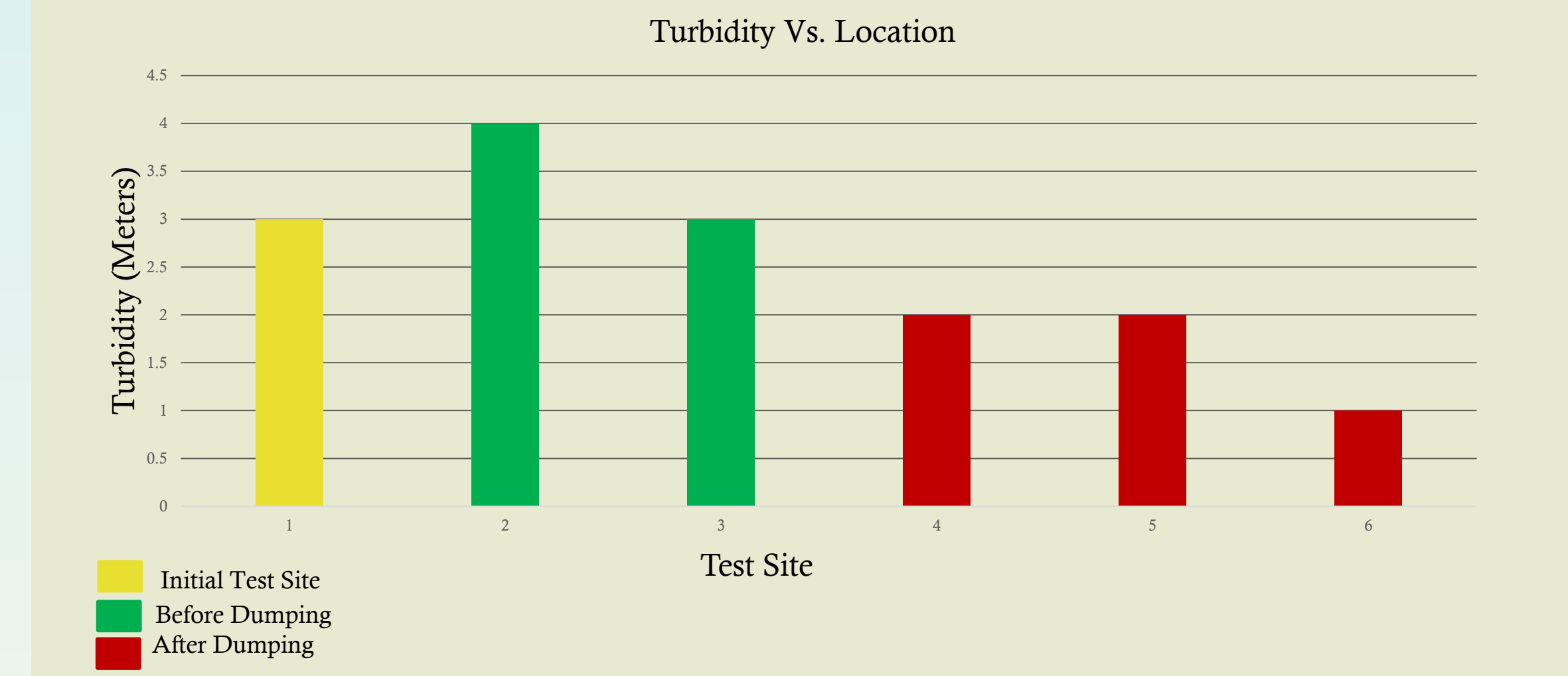


Figure 3: Based on this test; visibility in water decreased after the initial discharge site and increased or stayed the same in the opposite direction in unpolluted water.

Discussion

Our study suggests that there is a shift in levels of dissolved oxygen between unpolluted water and discharged water. In turn, these low levels of (DO) drastically impair the livelihood and frequency of Coho Salmon in the Santa Rosa River as well as the connecting Laguna de Santa Rosa and Russian River. Our study concurs with previous research that suggests a healthy level of DO is at least 8 Mg/L in which Coho can survive and go through all necessary life stages, although a higher DO level is desirable for a higher population. One should look into other possible causes for the salmon population decline and see how they all connect to further insure a stable salmon population. (Spoor,1990)

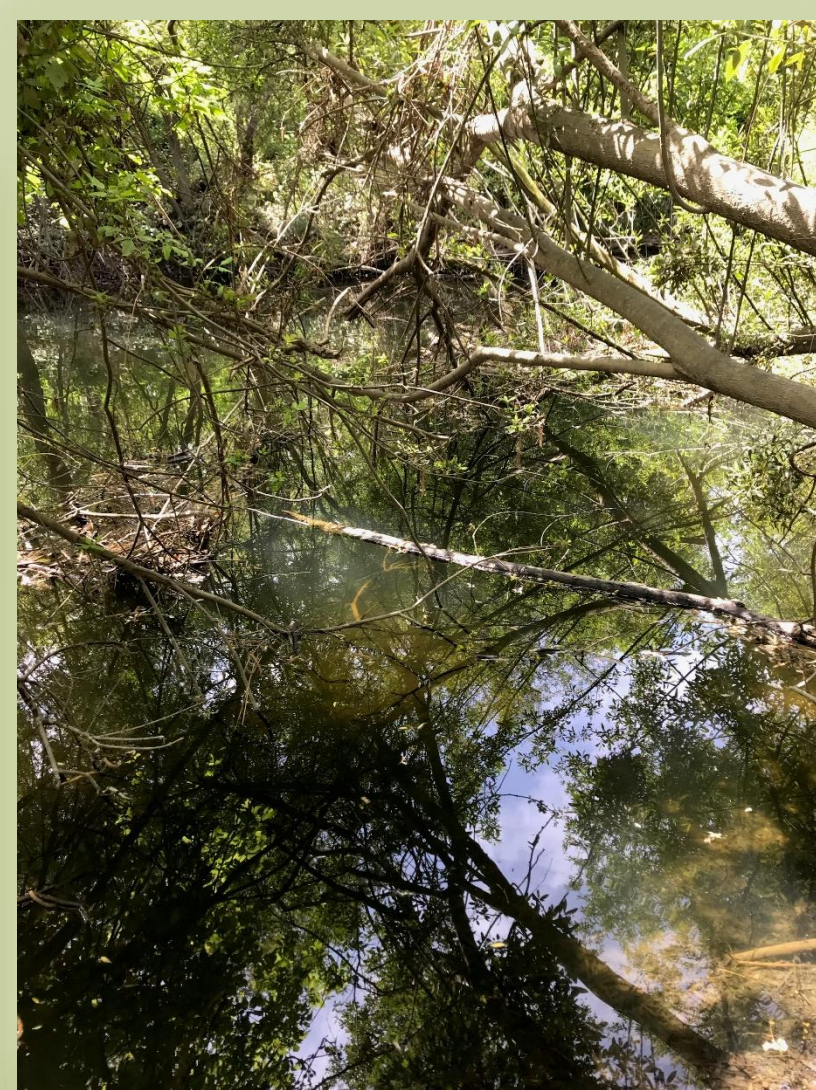
Conclusions

Our study found that low DO levels have been recorded (which would not support Coho Salmon) at areas of the river with reclaimed water which may be due to lack of photosynthesis of underwater plants caused by higher turbidity which has also been recorded in areas with reclaimed water. We should comprehend that Coho Salmon are in important resource and benefit the ecosystem as a whole and we as a community should strive to reestablish the population of these beneficial species in order to further develop our natural and beautiful ecosystem.

References

- Spoor, W.A.1990. Distribution of fingerling brook trout, *Salvelinus fontinalis* (Mitchill), in dissolved oxygen concentration gradients. *J.Fish. Biol.* 36:363-373.
- NIWA. (n.d.). Dissolved oxygen (DO) is a relative measure of the amount of oxygen (O₂) dissolved in water in Dissolved oxygen (DO) is a relative measure of the amount of oxygen (O₂) dissolved in water..Retrieved from https://www.niwa.co.nz/ourscience/freshwater/tools/kaitiaki_tools/impacts/dissolved-oxygen

Picture 2: Initial test site; site of discharge



(Nicolas Sta Maria Asi, 2018)

Picture 3: Roy Nicolas Sta Maria Asi taking turbidity measurements with secchi disk.



(Cardenas, 2018)

Picture 1: Fernando Cardenas taking turbidity measurements with secchi disk.



(Nicolas Sta Maria Asi, 2018)

Acknowledgements

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