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THE EFFECTS OF DECREASED SALINITY ON JUVENILE CALIFORNIA  
HALIBUT, PARALICHTHYS CALIFORNICUS

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A Thesis  
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Faculty of  
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by  
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## ABSTRACT

Results of experimental exposure to reduced salinity suggest that juvenile California halibut would be negatively impacted if freshwater inflows to coastal wetlands are augmented with reclaimed water. Separation of young-of-the-year (YOY) into size classes revealed effects that were not apparent when all test individuals were combined.

Small YOY (45-102 mm SL) are more adversely affected by decreased salinity than medium YOY (103-159 mm SL) and large YOY (160-216 mm SL) when subjected to continuous (92 days) and pulsed (5 hours every 48 hours) exposure to 34‰, 17‰, and 8‰ seawater. For pulsed exposure to 8‰, small YOY survived 52% longer than halibut continuously exposed to 8‰ (mean survivorship 30 days). Halibut continuously held at 17‰ survived an average of 49 days, whereas those subjected to pulses of 17‰ lived for 57 days. Pulsed exposure to 17‰ resulted a mean survivorship 16 days longer than pulsed exposure to 8‰. Medium YOY were more tolerant, with halibut continuously exposed to 8‰ surviving for 47 days and 53 days upon pulsed exposure to 8‰.

Growth was also affected by decreased salinity. Small YOY suffered the greatest weight loss, losing 5 grams in 30 days upon continuous and pulsed exposure to 8‰. Pulsed exposure caused a mean weight loss over 58 days of 4 grams at 8‰ and 5 grams at 17‰, compared to 1 gram for SW. Large YOY showed a rapid weight loss at the start of the experiment and a steadier weight loss towards the end of the experiment.

In an experimental gradient, small YOY preferred higher salinities (34‰), while medium and large YOY tolerated and preferred slightly lower salinities (28 and 34‰). Upon exposure to lower salinities all size groups showed an increase in oxygen consumption, with continuous exposure to 8‰ causing the greatest increase in oxygen consumption.

No freshwater augmentation should occur. If augmentation should occur, discharges should be pulsed, reducing the impact on halibut.

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