Calculating Fish Biomass Available for Impingement Mitigation (Productivity Values Derived from Allen 1982)

A. Allen calculated 9.35 grams Dry Weight/meter^2/year fish productivity in Upper Newport Bay

B. Conversion

1. Grams Dry Weight = Grams Wet Weight x 4

2. 9.35 X 4 = 37.4 grams Wet Wet/meter^2/year

C. There are 4,047 square meters in one acre

1. Therefore, 4,047 X 37.4 = 151,357.8 grams Wet Weight/acre/year

2. Allen's productivity value: **151.35 kg** Wet Weight/acre/year

3. **Thus, approximately 150 kg/acre/year of fish biomass is available to mitigate for impingement**.

D. Poseidon agreed to mitigate for entrainment of the dominant lagoon larval species by restoring 49 acres of estuarine wetland as follows:

Most Commonly Entrained **Lagoon** Species	Proportional Mortality
Gobies	21.6%
Blennies	8.6%
Garibaldi	6.5%
Average	12.2%

APF (Lagoon Species) = Proportional Mortality (pm) X area of Source Water Body (SWB)
APF (Lagoon Species) = 12.2% x 304 acres
APF (Lagoon Species) = 37.1 acres @ 50% confidence level
APF (Lagoon Species) = 49 acres @ 80% confidence level

E. Poseidon agreed to mitigate for the dominant ocean larval species by creating 6.4 acres of estuarine wetland as follows:

Most Commonly Entrained **Open Ocean** Species	Proportional Mortality
White Croaker	0.1%
Northern Anchovy	0.14%
California Halibut	0.17%
Queenfish	0.37%
Spotfin Croaker	0.63%
Average	0.29%

Calculating Fish Biomass Available for Impingement Mitigation
(Productivity Values Derived from Allen 1982)

APF (Open Ocean Species) = Pm x SWB
APF (Open Ocean Species) = 0.29% x 22,000 acres x 1/10
APF (Open Ocean Species) = 6.4 acres @ 80% confidence level

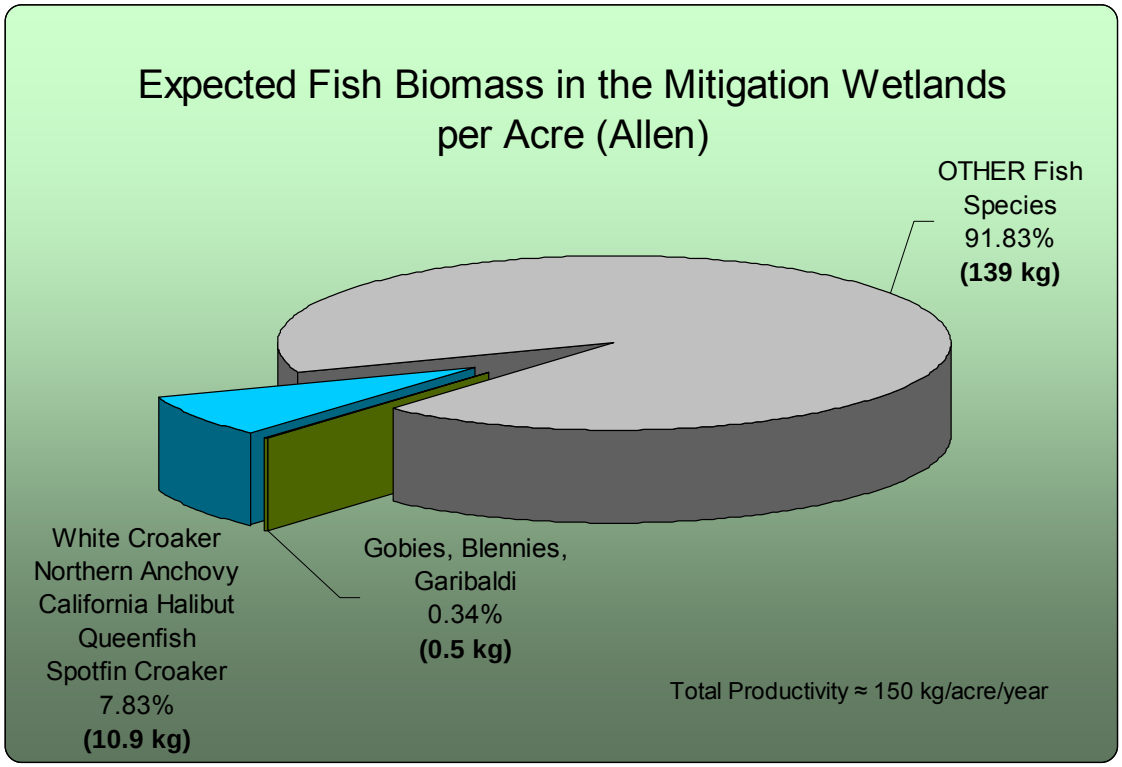
F. The mitigation wetlands will produce OTHER fish species, i.e., those that are not commonly entrained.

1. To the extent that mitigation wetlands produce fish OTHER than gobies, blennies and garibaldi, the biomass of these other fish can be used to offset impingement mitigation in 49 acres.

2. To the extent that mitigation wetladns produce fish OTHER than white croaker, northern anchovy, California halibut, queenfish and spotfin croaker, the biomass of these other fish can be used to offset impingement mitigation in 6.4 acres.

G. Per Allen, the mitigation wetlands will produce approximately 150 kg/year of fish biomass.

H. Per Allen, the mitigation wetlands will produce fish species that are predominantly NOT the most commonly entrained (i.e., OTHER fish)



Calculating Fish Biomass Available for Impingement Mitigation (Productivity Values Derived from Allen 1982)

I. Assuming impingement of 4.7 kg/day of fish biomass, 11.5 acres of intertidal mudflats and subtidal habitats capable of productivity and species diversity comparable to Upper Newport Bay will provide full impingement mitigation as follows:

1. 4.7 kg/day fish impinged x 365 days/year = 1,715.5 kg/year fish impinged.

2. The biomass available for mitigation for impingement is calculated in the figure above:

   a. The available biomass in 49 acres = 49 (91.83% + 7.83%) X 150 kg/year = 7,325 kg/year

   b. The available biomass in 6.4 acres = 6.4 (91.83 +0.34) X 150 kg/year = 884 kg/year

   c. Therefore, in 55.4 acres , available biomass = 7,325 + 884 = 8,209 kg/year

3. 8,209 kg/year / 55.4 acres = 148 kg/acre/year

4. 1,715 / 148 = 11.5 acres

5. **Therefore, by producing 11.5 acres of intertidal/subtidal habitat, Poseidon will fully offset 4.7 kg/day impinged fish biomas.**

Respectfully submitted,

Mr. Chris Nordby

President/Principal Biologist

Nordby Biological Consulting