



State of California – Natural Resources Agency  
DEPARTMENT OF FISH AND WILDLIFE  
Ecosystem Conservation Division - Water Branch  
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**EDMUND G. BROWN JR., Governor**  
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April 29, 2013

Dan Ray  
Chief Deputy Executive Officer  
Delta Stewardship Council  
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**Subject: RESPONSE TO QUESTIONS CONCERNING OPPORTUNITIES TO MINIMIZE HABITAT IMPROVEMENTS THAT INCREASE HABITAT SUITABILITY FOR NONNATIVE INVASIVE SPECIES, STRIPED BASS OR BASS**

Dear Mr. Ray:

In response to your April 23, 2013 questions about whether it is feasible to improve the Delta's aquatic habitats for native species while still minimizing increases in habitat suitability for nonnative invasive species, striped bass or bass, the Department of Fish and Wildlife (Department) is providing the following preliminary information about measures that can contribute to that objective. Much of the following information was compiled during a scientific evaluation of Prospect Island restoration design alternatives (ERP 2013).

Please recognize that the bullets below do not represent an exhaustive list and are not organized in any particular order of priority.

- Minimize (when appropriate) restoration design that introduces human-made structures, as these are often areas where predators congregate.
- Design habitat improvements that have hydraulic and depth diversity for feeding, resting and refuge from predators.
- Avoid creating high velocity gradients (large changes between high and low velocity flows) associated with abrupt changes in structural features, such as at breaches, as these tend to provide feeding locations for 'mobile' predators. As breach size increases the hydrodynamic structure available for use by predators decreases. High velocity gradients at such features may reduce the ability of native fish to avoid predators.
- Minimize the establishment of dense vegetation structure associated with submerged/floating aquatic vegetation (SAV/FAV), as these are often utilized by 'lay-and-wait' predators. In addition, SAV/FAV beds may also act as 'biological filters' for sediment (Nobriga et al. 2008), influencing localized turbidity levels.
- Create conditions that encourage turbidity.

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- Design for bi-directional tidal circulation to focus tidal energy, which helps maintain channel velocities and discourage the establishment of SAV/FAV.
- Create floodplain habitat that is seasonally inundated during peak native fish spawning and rearing periods and is dry during other periods to prevent the spawning and rearing of nonnative fish (Sommer et al. 2001; Sommer et al, 2004) and the colonization of SAV/FAV and clams (Lucas and Thompson, 2012).

If you have any questions or require clarification regarding this information, please contact Dave Zezulak, Ph.D., at (916) 445-3690 or by e-mail at [Dave.Zezulak@wildlife.ca.gov](mailto:Dave.Zezulak@wildlife.ca.gov).

Sincerely,



Scott Cantrell  
Chief, Water Branch

cc: California Department of Fish and Wildlife

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## References

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