

Committee on Resources Hearing, February 27, 2006, Stockton California
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1. My comments will focus on briefly describing some of our abundance indices. I'll present 2005 abundance results and discuss some of the other measures of fish well-being collected in 2005.

2. Interagency Ecological Program (IEP) uses relative abundance indices to monitor the status of young fishes and zooplankton in the San Francisco Estuary.

These are not estimates of absolute population size, but instead are relative measures, meant to be compared against one-another to depict population trends and changes over time.

To gather this information we use the same sampling gear and sampling techniques to collect organisms at the same locations month to month across years, the data collected can be compared across time to examine the patterns of change.

3. IEP uses nets towed through the water column to capture the young fishes and zooplankton, providing information on their size and distribution as well as abundance. Young fishes are targeted in their first year of life as indicators of that year's reproductive success and as early predictors of eventual trends in the adult populations. Zooplankton species are important diet components of young fishes and are targeted as a means to examine their role in the survival of young fishes.

4. Long-term monitoring fish information is from the Fall Midwater Trawl Survey collects fishes from September through December.

5. The Mysid – Zooplankton Survey captures zooplankton monthly year-round. The monthly information is combined into seasonal abundance indices for spring (March-May), summer (June-August) and fall (September-November), and these seasonal indices track trends in food resources available to pelagic fishes.

6. Our concern for pelagic fishes resulted from the observation that four fish species, all with slightly different life history traits, all exhibited low abundance 2002-2004. At the same time, several species of copepods, small zooplankton that form important components of the fishes' diets, were observed to be in low abundance also. This latter observation on zooplankton was in part due to a calculation error that has been corrected.

7. Our expectations for 2005 were for modest improvement in abundance for delta smelt and striped bass based upon improved spring river outflows and we expected that threadfin shad and the important copepods would do well in summer.

We didn't expect winter spawning longfin smelt to do particularly well, due to relatively low winter outflows (their abundance is well related to the magnitude of winter outflow).

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8. Similarly, the 2005 Fall Midwater Trawl Survey species indices were also below expectations for striped bass and delta smelt (see Figure 1):

- Striped bass improved but remained in very low abundance.
- Delta smelt were at record low abundance.
- Longfin smelt were close to record low abundance.
- Threadfin shad increased modestly, but remained in low abundance.

9. Two copepod species, *Eurytemora affinis* and *Pseudodiaptomus forbesi*, are important early foods for all upper Estuary fishes.

The contributions of these two species to fish food resources were low in spring 2005, but were very high by summer.

10. In 2005, we collected information on fish diet, condition and conducted growth analyses based upon changes in length. We wanted to know what fishes were currently eating and how much, and whether diet and ration might relate to their condition (that is, their relative fatness or skinniness).

11. Field collections for diet and condition began in June, so only a part of a year was sampled. Diets were determined for young striped bass, delta smelt, threadfin shad and inland silverside.

- Most individuals of all species had food in their stomach
- Delta smelt were very reliant on copepods for food, but ate a broad variety of species.
- Striped bass were less reliant on copepods and focused more heavily on larger “shrimp-like” mysids and amphipods.
- Inland silversides, a species increasing in abundance, ate a broad variety of items including more *Limnoithona* than others and terrestrial insects not found in other diets.
- The copepod *Pseudodiaptomus* was important to all.

12. Fishes caught during the summer were in good shape weight-wise. The condition of the four target fishes (delta smelt, striped bass, threadfin shad, inland silverside) in 2005 tended to be the same as or “fatter” when compared to data from recent years 2001-2004.

We did have some data from 2003 and 2004 indicating regional differences in striped bass condition. These will be discussed in conjunction with an upcoming presentation about 2006 hypotheses.

13. Initial investigations of fish growth focused on whether changes occurred coincident with fish declines; that is we compared growth rates from 2001 and prior year with those of 2002-2004.

- Growth rate of striped bass and delta smelt did not appear to decline after 2001.