U.S. FISH AND WILDLIFE SERVICE – SPOTLIGHT SPECIES 5-YEAR ACTION PLAN
2010-2014

Common Name: Delta Smelt

Scientific Name: *Hypomesus transpacificus*

Lead Region: Pacific Southwest Region

Lead Field Office: San Francisco Bay-Delta Fish and Wildlife Office

Species Information:

Status: Threatened

Recovery Priority Number: 2C

Recovery Plan: Recovery Plan for the Sacramento/San Joaquin Delta Native Fishes, November 1996

Most Recent 5-year Review: March 31, 2004

Other: 90-Day Finding on a Petition to Reclassify the Delta Smelt (Hypomesus transpacificus) From Threatened to Endangered (73 FR 39639), July 10, 2008.

Other: Determination of Threatened Status for the Delta Smelt (58 FR 12854), March 5, 1993

Threats:

Factor A -- Present or threatened destruction, modification or curtailment of habitat or range

1. Salinity
   - Delta smelt utilize the low salinity zone (LSZ) as preferred habitat for rearing
   - Upstream reservoir operations, upstream diversions, and exports have reduced Delta outflow resulting in the LSZ moving upstream from its historic location
   - Upstream movement of the LSZ has resulted in delta smelt moving into smaller, less productive areas
   - Upstream movement of the LSZ in the fall is correlated with reduced smelt abundance the following summer
2. Turbidity
   - Delta smelt require turbid waters in rearing areas to capture prey and avoid predators

- Water clarity has been increasing over the past several decades
- Upstream dams decrease total dissolved solids, resulting in increased water clarity downstream
- Another cause may be the introduction of *Egeria densa*, an invasive water plant that traps suspended sediments

Factor B -- Overutilization for commercial, recreational, scientific or educational purposes

- Scientific monitoring of delta smelt abundance and location occurs at different times throughout the year
- Concern about potential impacts of sampling has led to recent adjustments in monitoring protocols

Factor C – Disease or Predation

1. Disease
   - No evidence that disease threatens delta smelt
2. Predation
   - Suspected to occur by a number of introduced species: largemouth bass, striped bass and inland silverside
   - Habitat for predators may be enhanced by delta water operations and *E. densa*

Factor D – Inadequacy of existing regulatory mechanisms

1. State Regulations
   - CESA –listed as threatened by State
   - CEQA – evaluation of impacts from State projects and requirement to mitigate for significant effects
   - SWRCB D-1641- Salinity regulation in Suisun Bay
   - Marine Invasive Species Act – prevent and minimize introduction of invasive species via commercial vessels
2. Federal Regulations
   - ESA - operation of the SWP and CVP has been conditioned by the Service's 2008 biological opinion
   - NEPA –evaluation of impacts from Federal projects
   - Clean Water Act – manages the discharge of pollutants, including ballast water and invasive species.

Factor E – Other natural or manmade factors

1. Entrainment
   - Adult and larval entrainment at CVP and SWP export facilities
   - Mirant power plants at Antioch and Pittsburg
2. Low population numbers
   - Stochastic events
   - Genetic Drift
   - Allee effects

3. Environmental contaminants
   - Pesticides
   - Endocrine disrupters
   - *Microcystis*
4. Introduction of non-native invasive species (in addition to predators listed in Factor C)
   - *E. densa* – impacts water clarity and habitat for largemouth bass
   - *Corbula amurensis* – competes for food

Target: Prevent Extinction
The delta smelt suffers from a very limited distribution and critically low population numbers. Through the recovery actions described here, we intend to ameliorate the effects of limited range and population numbers and prevent the extinction of this species.

Measure: The following measures are intended to address specific threats
1. Delta flows reflect natural hydrograph
2. Improve survival rates at all life stages
3. Prevent extinction

Actions: The Delta Native Fishes Recovery Plan, which covers delta smelt, is outdated and in the process of revision. These actions are described in several documents, including the *Pelagic Fish Action Plan* (California Resources Agency 2007), the draft *Ecosystem Restoration Program Conservation Strategy* (California Fish and Game 2008), *Preventing Extinction* grant applications, and the Service's 2008 *Formal Endangered Species Act Consultation on the Proposed Coordinated Operations of the Central Valley Project (CVP) and State Water Project (SWP)*. Each action below is numbered to correspond to the measure given above.

1. Establish Delta outflows proportionate to unimpaired flows in the watershed (ERP Conservation Strategy). Addresses:
   a. Factor A:
      i. Facilitate upstream movement of pre-spawning adults
      ii. Facilitate downstream movement of juveniles
      iii. Seasonal expansion of the low-salinity zone likely improves habitat quality and quantity
   b. Factor E:
      i. Increased winter and spring flows may reduce water clarity
      ii. Variable salinity may reduce success of invasive species
      iii. Increased flows flush contaminants

   Estimated Costs of the Action: appropriate staff is in place - no additional cost; if water rights must be purchased, costs could exceed $10 million

2. Implement water project operations that minimize reverse flows in the Delta when the risk of entrainment into water diversions is high (Consultation). Addresses:

a. Factor A:
    i. Increases suitability of spawning habitat
    ii. Minimizes losses to entrainment

Estimated Costs of the Action: appropriate staff is currently in place - no additional cost

3. Work with the University of California-Davis and California Department of Water Resources to establish a genetics management plan for delta smelt (*Preventing Extinction* grants). Addresses:
    a. Factor E:
        i. Loss of genetic integrity
        ii. Stochastic demographic extinction

    Estimated Costs of the Action: Support UC-Davis genetic research and culture facility at Livingston Stone NFH - $300,000/year for 5 years: $1.5 million;

Identify responsible parties:

Action 1: ERP implementing agencies, including but not limited to the Service, California Department of Fish and Game, California Department of Water Resources, NOAA National Marine Fisheries Service, USEPA, USBR, stakeholders through the BDCP (see below) and recovery planning processes
Action 2: Service, California Department of Water Resources, USBR through ESA section 7 consultation and Interagency Ecological Program agencies (see below) for data collection
Action 3: Service, University of California-Davis

1. Role of other agencies: Some of the above actions may be implemented under the ERP Strategic Planning process, which involves the CalFed agencies in general and the California Department of Fish and Game and NOAA Fisheries in particular. Funding for ERP comes from the CalFed member agencies.

2. Role of other ESA programs:
    - The Bay-Delta Conservation Plan (BDCP) is an applicant-driven process through which certain activities would be permitted under ESA, CESA and the California Natural Community Conservation Planning Act. The BDCP planning process will develop actions to address the impacts of water diversions to resident and transient Delta species and their habitats. Funding for BDCP comes from the potentially-regulated entities.
    - The existing Delta Native Fishes Recovery Plan is outdated and being revised as a threats-based plan.
    - The Service recently concluded interagency consultation on the effects of the State and Federal water export projects in the Delta. The resulting biological

opinion includes an ITS and an RPA to address direct losses of delta smelt to the water projects and adverse modification of delta smelt critical habitat.

3. Role of other FWS programs:
   - The Service funds a delta smelt research biologist position at the Stockton Fish and Wildlife Office to investigate potential threats to the species. Exiting funding comes from the Service and from CalFed agencies through grants from the CalFed Science Program.
   - The Service is presently cooperating with scientists from the University of California-Davis and the California Department of Water Resources to develop a genetic refuge population of delta smelt. Existing funding comes from *Preventing Extinction* grants and from DWR.

4. Other:
   - The Governor's "Delta Vision" process identified a strategy for managing the Delta as a sustainable ecosystem that supports both environmental and economic processes. The process concluded with the issuance of a Strategic Plan which, if implemented, would drive Delta restoration in both the near- and long-term.
   - The Interagency Ecological Program (IEP) was created by State and Federal resource agencies to focus scientific inquiry on Delta issues. The IEP initiated the Pelagic Organism Decline (POD) study effort in 2005 to focus scientific effort and resources on the most recent and precipitous declines in abundance of several species, including delta smelt.

Additional funding analysis: If additional funding became available, the following actions could be undertaken:

- Construction and staffing of a conservation culture facility in the Delta for delta smelt.
- Habitat restoration projects proposed by the ERP Conservation Strategy, particularly those intended to improve spawning success and juvenile rearing.
- Additional research investigations of potential threats to delta smelt.

FIELD OFFICE APPROVAL:

Approve: _____ Date: 7-30-09

Acting Dan Castleberry
Field Supervisor, San Francisco Bay-Delta Fish and Wildlife Office

REGIONAL OFFICE CONCURRENCE

Approve: _____ Date: 8/27/09

Mike Fris
Assistant Regional Director for Ecological Services