A Path Forward for California’s Freshwater Ecosystems

December 5, 2019

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Supported with funding from the S. D. Bechtel, Jr. Foundation and the funders of the PPIC CalTrout Ecosystem Fellowship
Outline: Freshwater ecosystem-based management

- Current approach not working
- An alternative path forward
- Freshwater ecosystem-based management in practice
- The legal basis
- Recent progress
- Sustainable watershed management plans
Freshwater ecosystem management is not working

- Multiple social, economic, environmental benefits of healthy ecosystems often overlooked
- Long-term decline of native biodiversity likely getting worse
- Vulnerable species vastly outnumber ESA-listed ones
- Over-reliance on state and federal ESAs to manage water

Source: Howard et al. (2015)
An alternative path: Ecosystem-based management

- Manages for *ecosystem condition* rather than listed species
- Integrates human uses and emphasizes multiple benefits
- Produces greater net benefits and reduces water conflict
Freshwater ecosystem-based management in practice: Planning and governance frameworks are key

- Frameworks should include:
  - Desired ecosystem condition and beneficiaries
  - Metrics and performance measures
  - Scientific support
  - Regulatory alignment, transparent governance, comprehensive agreements
  - Reliable funding

Delta “system” water achieves multiple benefits

Source: Gartrell et al. (2017)
Freshwater ecosystem-based management in practice: A suite of management actions

- Actions should include:
  - Ecosystem water budgets
  - Connecting structural habitat to functional flows
  - Co-managing water quality and quantity
  - Active management of native and non-native species
  - Managing at appropriate scale

Ecosystem water budgets can improve functional flows

Source: Mount et al. (2019)
Ecosystem-based management is consistent with ESAs, other state and federal laws

- **Water quality and right laws**
  - Clean Water Act/Porter-Cologne Act
  - Public trust and reasonable use

- **Federal and state ESAs**
  - More flexible than currently implemented
  - HCPs/NCCPs

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**Other Relevant Laws**

- Fish and Game Code § 5937
- Clean Water Act § 404
- Federal Power Act
- Habitat Restoration and Enhancement Act
- Lake or Streambed Alteration Agreements
- NEPA and CEQA
- Regional Conservation Investment Strategies
- Sacramento-San Joaquin Delta Reform Act
- Sustainable Groundwater Management Act
Some species and water management programs already include approach elements

12 programs offer potential models

We can improve existing programs and encourage more comprehensive ecosystem-based management plans
1) Incentivize Sustainable Watershed Management Plans

- State Water Board, with support of legislature, should:
  - Establish criteria
  - Encourage comprehensive agreements
  - Establish timelines, with regulatory backstops
  - Adopt agreements as water quality control plans

Source: Upper Santa Ana River Habitat Conservation Plan
Plans and comprehensive agreements: Two ways forward

1) Incentivize Sustainable Watershed Management Plans
   - State Water Board, with support of legislature, should:
     - Establish criteria
     - Encourage comprehensive agreements
     - Establish timelines, with regulatory backstops
     - Adopt agreements as water quality control plans

2) Mandate Sustainable Watershed Management Plans
   - Model after Sustainable Groundwater Management Act
   - Include these additional elements:
     - Define priority watersheds
     - Use water right and other regulatory authorities as backstop if local and regional organization fails
Reasons to adopt ecosystem-based management

- Adaptable to changing conditions, new knowledge
- Anticipates and reduces new ESA listings while promoting recovery
- Integrates human uses of ecosystems with conservation objectives
- Aligns agency priorities and actions around multi-benefit projects

Half the fish at high risk of extinction in next drought are *not* listed under ESAs

Source: Hanak et al. (2015)
Thank you
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About these slides

These slides were created to accompany a presentation. They do not include full documentation of sources, data samples, methods, and interpretations. To avoid misinterpretations, please contact:

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Thank you for your interest in this work.