

A Path Forward for California's Freshwater Ecosystems

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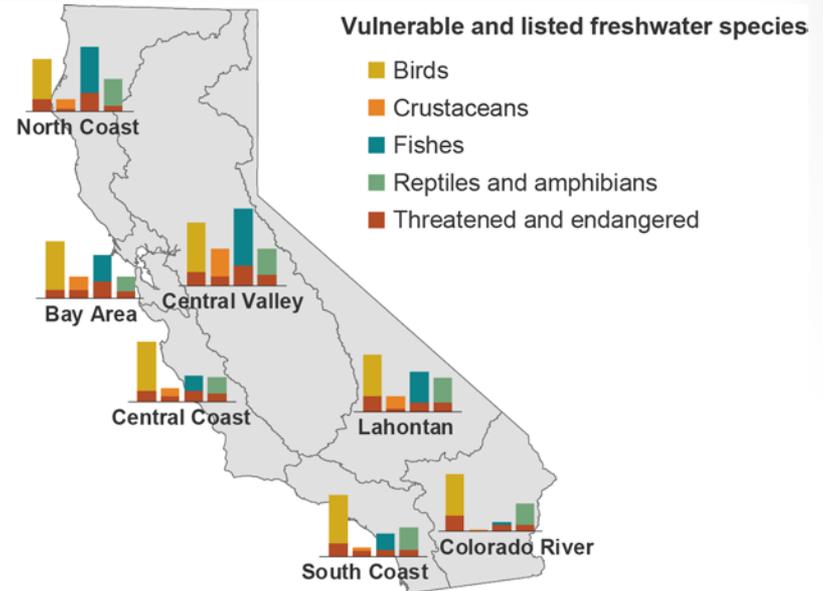
Outline: Freshwater ecosystem-based management

- 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

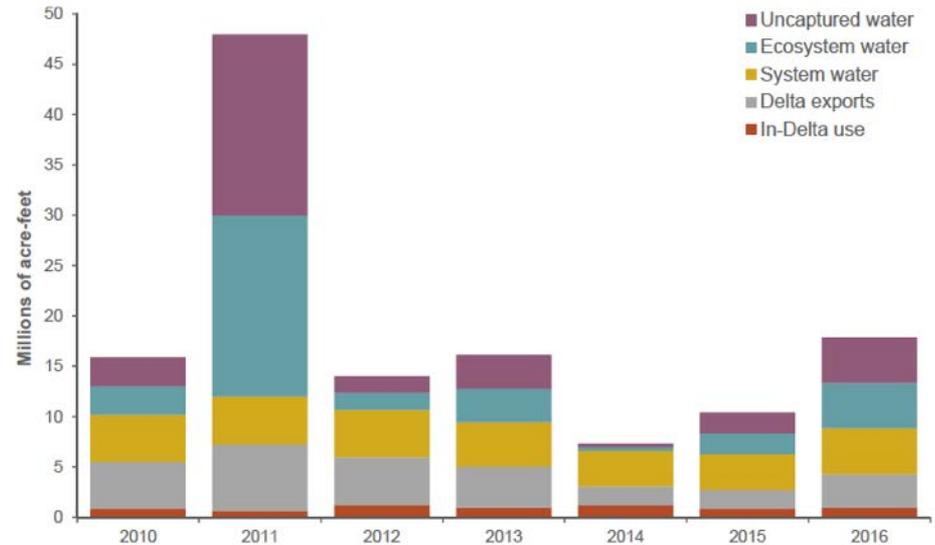
- Manages for *ecosystem condition* rather than listed species
- Integrates human uses and emphasizes multiple benefits
- Produces greater net benefits and reduces water conflict



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

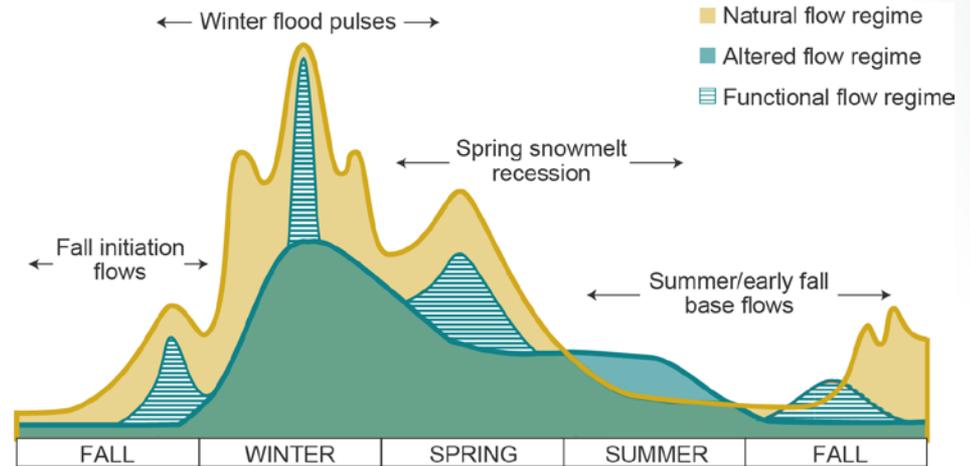


Source: Gartrell et al. (2017)

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

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

Recent progress: Programs worth watching

- 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

12 potential models from across California



Source: Mount et al. (2019)

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



Source: Upper Santa Ana River Habitat Conservation Plan

Plans and comprehensive agreements: Two ways forward

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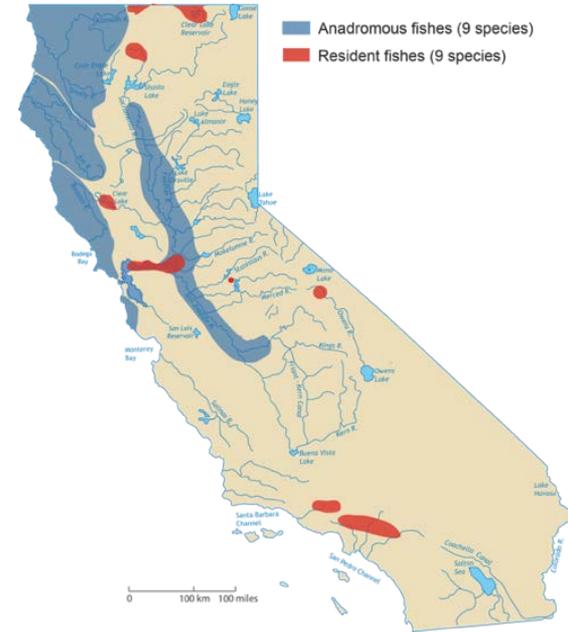
2) Mandate Sustainable Watershed Management Plans

- 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.