Delta Independent Science Board Update

Dr. Stephen Brandt, Chair
Dr. Jay Lund, Past Chair
01. OVERVIEW OF THE DELTA ISB
Who We Are?

Dr. Steve Brandt
Chair

Dr. Jay Lund
Past Chair

Dr. James Cloern

Dr. Virginia Dale

Dr. Joe Fernando

Dr. Tanya Heikkila

Former Members

Dr. Liz Canuel

Dr. Tracy Collier

Dr. Dick Norgaard

Dr. Bob Naiman

Dr. Diane McKnight

Dr. Lisa Wainger

Dr. John Wiens

Dr. Joy Zedler
What We Do?

The Delta Reform Act (2009):

• Provide oversight of the scientific research, monitoring, and assessment programs that support adaptive management in the Delta through periodic reviews of each of those programs
• Provide independent advice on the Delta Plan
• Consult with the Council on the appointment of the Lead Scientist
Current Approaches

• Review agency documents (e.g., Delta Science Plan, Delta Plan amendments)
• Review programs by themes. Thematic reviews presented to the Council:
  1) Restoration (2013)
  2) Fish and Flows (2015)
  3) Adaptive Management (2016)
  4) Levees (2016)
  5) Delta as an Evolving Place (2017)
  6) Water Quality (2018)
  7) Interagency Ecological Program (2019)
General Review Purpose

• Evaluate the state and adequacy of the science
• Recommend forward-looking strategic science priorities
  ▪ Identify gaps
  ▪ Increase scientific credibility
  ▪ Improve research clarity
  ▪ Advance the debate about Delta issues
  ▪ Seek better connectivity between science, management and policy
• Delta ISB does not make or recommend policy decisions
Current Activities

*Drafting Reviews for Public Comments*
  - Water Supply Reliability
  - Monitoring Enterprise

*Outreach/Implementation*
  - Science Needs Assessment
  - Non-native Species Review

*Planning Future Reviews*

*Upcoming Requests*
  - Science Action Agenda Update (fall 2021)
General Approach

1. Identify relevant thematic topics
   • Delta Plan Chapter Topics
   • Panels/Discussions
   • Stakeholder Surveys
2. Prospectus on topic, goals, and methods
3. Draft review for public comment
4. Final review and report to the Council
5. Outreach
   • Presentations at conferences
   • Flyers
   • Publications
   • Stakeholder engagement
DELTA ISB REVIEW:

02. NON-NATIVES SPECIES IN A DYNAMIC DELTA
Why Non-native Species Science?

• One of the greatest global threats to the integrity of ecosystems and one of the 5 drivers of ecosystem change.

• The California Bay-Delta is one of the world’s most invaded estuaries.

• Key component in the Delta Reform Act and reducing the impact of non-native species is also one of the core strategies highlighted in the Ecosystem Amendment to the Delta Plan.

• Threatens the achievement of the coequal goal of protecting, restoring, and enhancing the Delta ecosystem...and even defining what an ecosystem is!
Review Goal

*Better understand the scientific needs related to this complex long-term issue.*

- Help agencies prevent and manage the threats and consequences of non-native species in Delta lands and waters.
- Focus on Delta-wide needs that span multiple agency responsibilities.
- Science-based prioritization framework to make decisions.
Review Process

• Extensive literature review
• Two panel discussions each composed with five experts who explored the status of science relative to non-native species in the Delta
• Delta ISB deliberations and public comments
• Participation in several workshops and scientific sessions, presentations, and discussions with managers
Findings: General

• The science related to invasions and non-native species is extensive and spans 6 decades

• Non-native species impact almost every ecosystem service and ecosystem sustainability

• Basic needs and technologies to better prevent, control and ultimately manage individual non-native species are similar across ecosystems

• Science is needed at each point in the management decision process
Findings: Delta

• The Delta is a highly modified ecosystem
• The global and local forces driving environmental changes in the Delta are ongoing, some at an accelerated pace
• These changes affect the vulnerability of the Delta to new invaders
• What is unique in the Delta are the institutional arrangements, responsibilities, scientific collaboration mechanisms, and funding structures to handle this issue
Recommendations

The Delta ISB’s overall recommendation is to encourage a more ecosystem-level, forward-looking, integrated approach to non-native species science in the Delta with a specific consideration of climate change.

We offer 7 specific recommendations.
1. Develop a comprehensive, spatially explicit, food-web model that is Delta-wide in scope and tied to environmental driving forces and conditions.
   - Improve our mechanistic understanding of non-native species currently in the Delta.
   - Predict potential impacts of new invaders.
   - Assess how potential threats of invasive species would be altered by climate change.

2. Define and prioritize detailed short-term and long-term project-level science needs by conducting a series of focused workshops or syntheses.
Stages of Management and Science in Dealing with an Individual Potential Invader

Science and Monitoring

- Threat Assessment
  - High: Prevention
  - Low: Continue Assessment

  Prevention
  - Yes: Continue Prevention
  - No: Eradication

  Eradication
  - Yes: Continue Control
  - No: Control

  Control
  - Yes: Continue Control
  - No: Adaptation

Adaptation
Prioritize Current Management Actions: Individual Species

3. Identify and prioritize new species that pose the greatest immediate and long-term threats to the Delta and re-evaluate this list regularly.

This list should be based on an evaluation of the expected ecosystem and economic impacts of each high-risk invader and include an assessment of likely pathways of introduction.
4. Go beyond individual species management and set ecosystem-level goals that recognize an ever-changing species pool and changing drivers.

- What are the Delta Ecosystem Goals in the context of changing drivers and species pool?
- Include the formal implementation of non-native species management and research into ecosystem restoration activities/programs.
Consider Ongoing and Future Changes of Drivers in the Delta

5. Evaluate threat assessments for non-native species in the context of a changing environment and multiple drivers, especially climate.

- Pathways
- Types of invader
- Susceptibility to invasion
- Ecosystem impact
Implementation: First Steps

6. Develop a comprehensive multi-agency invasive-species coordination and implementation plan with the assignment of responsibilities and authorities that span monitoring, rapid response, control, and science expertise.

7. Develop a single ‘go to’ science source of expertise and information with proper authorization and funding.
Conclusions

• Science can be used to better predict, detect, control, or adapt to non-native species and inform management to set ecosystem-level priorities to minimize harm.

• Proactive understanding and monitoring is critical. - *anticipation*

• Dealing with the surprise invasion of “Newtrina.”

Is this ”Newtrina”?
03. FUTURE PLANS
Upcoming Plans: May - August

• Wrap up Monitoring Enterprise Review and Water Supply Reliability Review
• Finish Science Needs Assessment (DPIIC)
• Plan for Future Reviews. Reconsidering the approach based off:
  ▪ Delta Science Program’s assessment of the Delta ISB
  ▪ Delta ISB members’ experiences
  ▪ Public feedback
## Overall Stakeholder Perceptions of the Delta ISB

<table>
<thead>
<tr>
<th>Survey Question</th>
<th>Mean</th>
<th>SD</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. The Delta ISB plays an <strong>essential</strong> role in the Delta</strong></td>
<td>3.22</td>
<td>0.76</td>
<td>115</td>
</tr>
<tr>
<td><strong>B. The Delta ISB plays a <strong>unique</strong> role in the Delta</strong></td>
<td>3.37</td>
<td>0.69</td>
<td>118</td>
</tr>
<tr>
<td><strong>C. The Delta ISB does not promote specific political agendas</strong></td>
<td>3.19</td>
<td>0.8</td>
<td>100</td>
</tr>
<tr>
<td><strong>D. The Delta ISB provides independent scientific oversight in the Delta</strong></td>
<td>3.15</td>
<td>0.76</td>
<td>119</td>
</tr>
</tbody>
</table>

DRAFT; Taken from the Delta Science Program’s Assessment of the Delta ISB
Overall Stakeholder Perceptions of the Delta ISB Reviews

<table>
<thead>
<tr>
<th>Survey Question</th>
<th>Mean</th>
<th>SD</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>E. Overall, Delta ISB reviews provide information that is <strong>relevant</strong> to the Delta management community</td>
<td>3.28</td>
<td>0.6</td>
<td>92</td>
</tr>
<tr>
<td>F. Overall, Delta ISB reviews <strong>enhance my confidence</strong> in science-based decision making in the Delta</td>
<td>3.08</td>
<td>0.81</td>
<td>87</td>
</tr>
<tr>
<td>G. Overall, Delta ISB reviews are scientifically <strong>rigorous</strong></td>
<td>3.26</td>
<td>0.70</td>
<td>90</td>
</tr>
<tr>
<td>H. Overall, I <strong>trust</strong> the scientific findings reported in Delta ISB reviews</td>
<td>3.29</td>
<td>0.66</td>
<td>87</td>
</tr>
<tr>
<td>I. Overall, I think ISB reviews provide <strong>good recommendations</strong>, even if they cannot be implemented</td>
<td>3.19</td>
<td>0.79</td>
<td>84</td>
</tr>
</tbody>
</table>

DRAFT; Taken from the Delta Science Program’s Assessment of the Delta ISB
New Possible Approaches

**Problem Focused, Narrower Reviews**
- More focused and less comprehensive than thematic reviews.
- Potential Ideas
  - Harmful Algal Blooms
  - Water Quality and Hydrodynamic Modeling

**Agency Program Reviews**
- Review individual programs that support adaptive management
- Approach:
  - Ask agencies for their science goals and plans every four years
  - Review the science and make recommendations.
Questions?