



The Importance of Decontamination in Controlling Aquatic Invasive Species

November 9, 2011



About the Speaker

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Overview



- Aquatic “Invasive Species” defined
 - Characteristics
 - Impacts
- How they spread
- Relevant laws and regulations
- Know threats
- How you can avoid spreading them
- What to do if you encounter them

What is an “Invasive Species”?



- A non-indigenous species that can/does cause significant economic or ecological impacts.
 - Introductions and impacts difficult to predict
 - Predictable and unpredictable vectors
 - Invasions typically begin with few individuals, therefore may go unnoticed

Characteristics of Invasive Species



- Tolerant of a wide range of environmental conditions
- Competitive
- High fecundity
- Few or no natural controls (predators)
- Easily dispersed

Impacts



- Impacts variable and difficult to predict; examples include:
 - Closures → impact local economies
 - Control and eradication efforts
 - Impair water quality
 - Altered food webs → impact apex species

How Aquatic Invasive Species (AIS) Spread



- Intentional introduction
 - Flowing water
 - Unintentional introduction (aka 'hitchhiking')
- Assume all waters you sample harbor a threat

Laws and Regulations



- Federal
 - Lacey Act: Prohibits interstate transport of 'injurious' wildlife
 - Noxious Weed Act: Prohibits interstate transport of 'noxious' weeds
- State
 - FGC § 6400: Prohibits intentional or unintentional placement of plants and animals in state waters
 - CCR Title 14 § 671: Prohibits importation, transportation and possession of live restricted animals
 - FAC: Hydrilla and noxious weeds

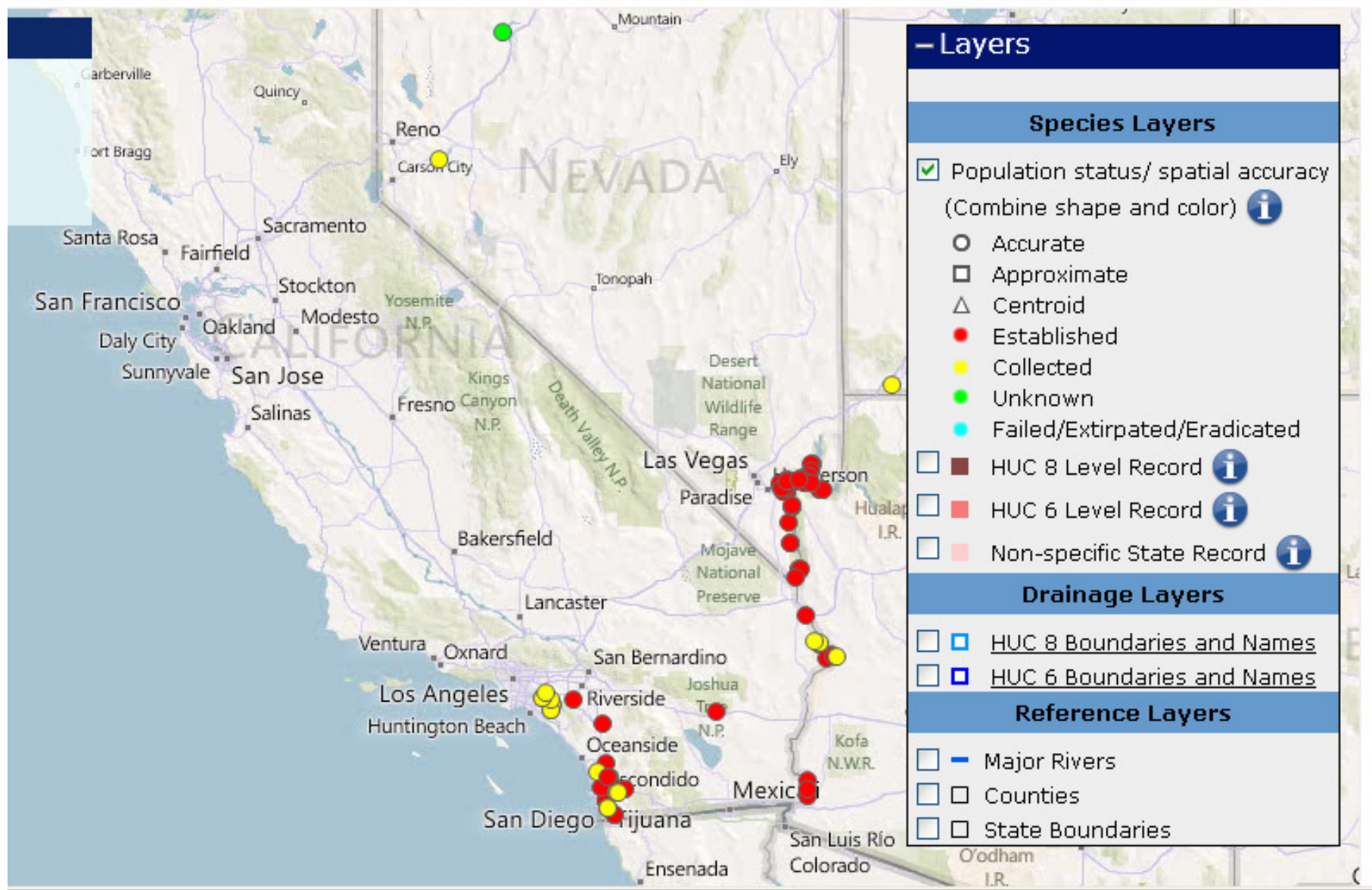
Quagga and Zebra Mussels

Dreissena bugensis, *D. polymorpha*



- Attach to surfaces
- Alternating light and dark stripes (but can lack stripes)
- Up to ~ 50 mm long
- Large populations consume phytoplankton, foul surfaces





Benson, A. J. 2011. Quagga mussel sightings. Retrieved 11/8/11

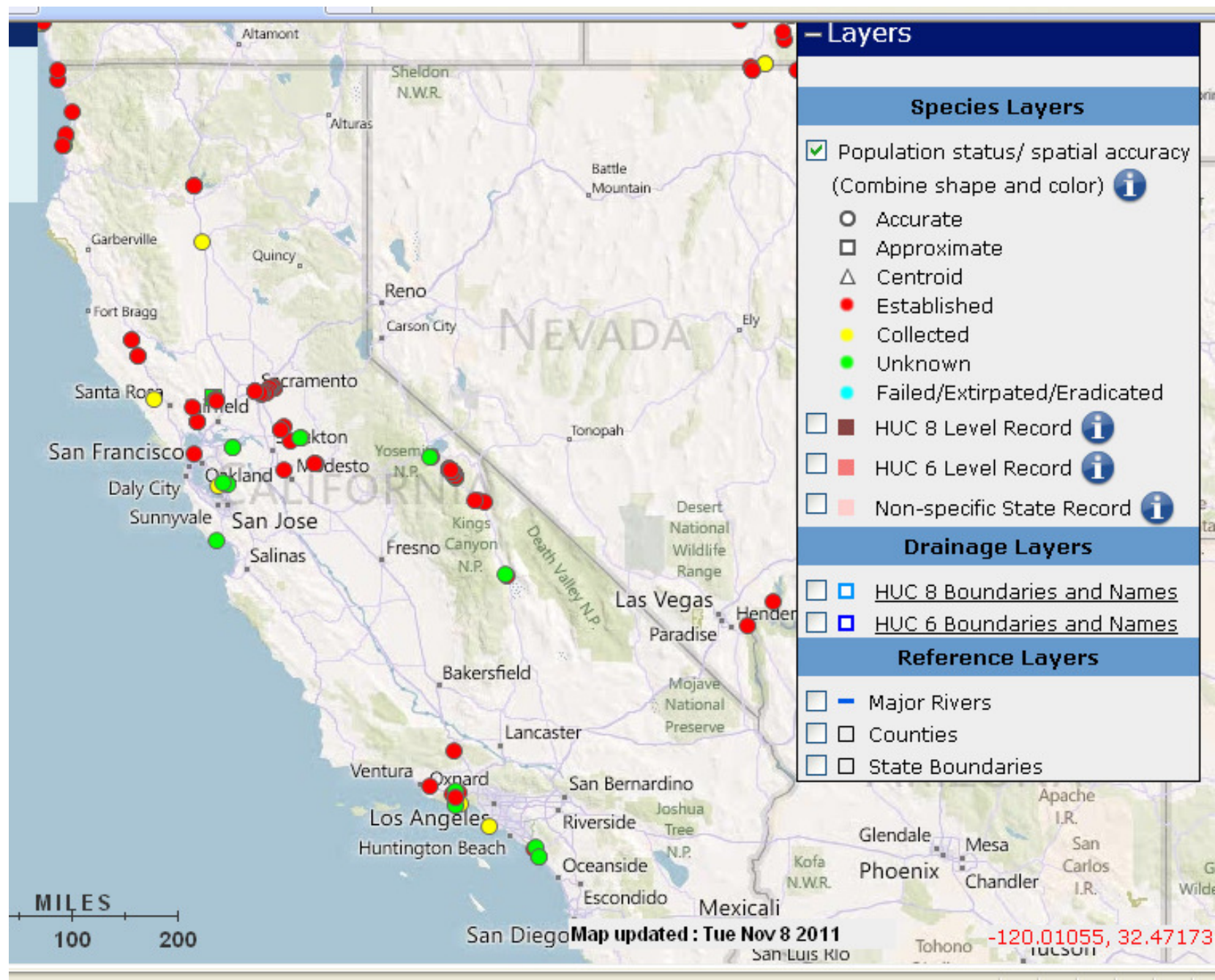
New Zealand Mud Snail

Potamopyrgus antipodarum



- Livebearer
- Up to 5 mm long
- Shell elongate, adults 5-6 whorls
- Difficult to identify because resemblance to other species; consult an expert





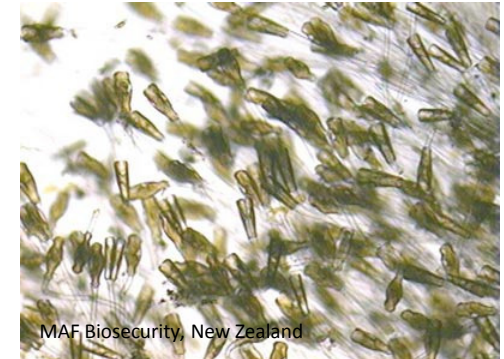
Benson, A. J. 2011. New Zealand mud snail sightings. Retrieved 11/8/11

Didymo

Didymosphenia geminata



- Diatom
- White, yellow, brown
- Resembles wet toilet paper
- Feels like wet cotton/wool
- Smother invertebrates, algae; unsightly



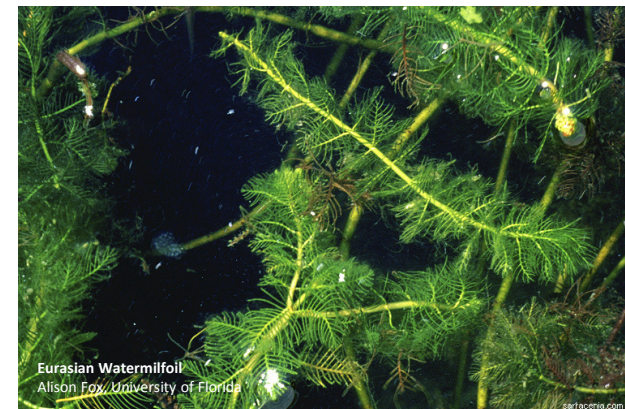


Spaulding, S. 2011. Didymo sightings

Invasive Aquatic Plants



- *Egeria densa*
- Eurasian watermilfoil
(*Myriophyllum spicatum*)
- *Hydrilla verticillata*



Pathogens and Diseases



- Infectious Haematopoietic Necrosis Virus (IHN)
- Viral Hemorrhagic Septicemia (VHS)
- Whirling disease (caused by the myxosporea parasite *Myxobolus cerebralis*)
- Chytridiomycosis (chytrid fungus)

How You Can Avoid Spreading AIS



- Stay out of the water
- **Dedicate gear to each waterbody**
- Sample to minimize spread within a waterbody
- Decontaminate gear between waterbodies
- Know the local flora and fauna
- Know the potential invaders



Sample to minimize spread

- Work from upstream to downstream
- Use the least amount of equipment necessary to get the job done (safely)
- Use gear that is easily cleaned

Decontamination



- The high-risk alternative to dedicated gear
- Depending on sampling schedule, decontaminating may restrict your fieldwork
- DFG has revised its recommendations:
 - Drying is preferred method
 - Chemical treatment is no longer recommended



Why Chemicals Aren't Recommended

1. Chemicals require care in handling and disposal
2. Pesticide use is restricted:
 - 'The label is the law'
 - Unregistered products may not be used as pesticides
3. The only quarternary ammonium product with supporting efficacy data for AIS (Sparquat 256) has been discontinued



Why Chemicals Aren't Recommended

- Therefore, there are no chemicals that DFG can ***recommend*** for AIS/infectious agent decontamination.

Drying



- Clean – scrub and rinse
- Allow to dry completely
- Maintain dry for an additional 48 hours; preferably in sunlight
- Considerations:
 - Requires time
 - Weather dependant

Hot Water Soak



- Clean – scrub and rinse
- Immerse in $>140^{\circ}$ F water for a minimum of 5 minutes
- Spray with $>140^{\circ}$ F water for 10 seconds
- Considerations:
 - Minimal time required
 - Requires hot water; may be impractical in the field or sensitive gear

Freezing



- Clean – scrub and rinse
- Freeze at $<32^{\circ}$ F for minimum of 8 hours
- Considerations:
 - Requires time
 - Weather dependant
 - May be impractical for sensitive gear



What To Do If You Encounter An AIS

- Collect a sample and record the specific location
- Report it to DFG at:
 - 866-440-9530
 - invasives@dfg.ca.gov

More Information



- Quarterly newsletter
- Informs public about activities related to invasive species
- Subscribe by emailing Invasives@dfg.ca.gov



www.dfg.ca.gov/invasives
invasives@dfg.ca.gov
(866) 440-9530

In this issue:

Section 1: Welcome to our First Newsletter

Section 2: DFG's Quagga/Zebra Mussel Project

Section 3: Mussel Magnitude

Section 4: Partner

Welcome to Our First Newsletter

Welcome to the Department of Fish and Game's (DFG) first newsletter about invasive species issues in California. While the newsletter is new, our concern about invasive species is not. As early as 1935, the Fish and Game Code contained provisions for restricting live animal importation "when such species are proved undesirable and a menace to the native wildlife or to the agricultural interests of this State."

At that time, DFG focused on restricting birds and mammals, and crayfish were the only aquatic species restricted. By 1972, the restricted species list contained many additional aquatic species, including species of snakehead, fish that were added to the federal injurious wildlife list in 2010. DFG biologists recognized early on the need to keep these invaders out of our waters.

In 1994, all members of the genus *Dreissena*, which includes zebra and quagga mussels, were identified as detrimental species to California and added to the list. When they arrived in Nevada,

In this, our first quarterly issue of Eye On Invasives, we focus on invasive mussels, and share with you some of the many efforts underway by DFG and our partners. Future issues will present a diverse array of invasive species, both aquatic and terrestrial, those currently in the state, and those identified as potential invaders.

We recognize that keeping our stakeholders informed is a key part of our prevention program. Please share this newsletter with others. Because invasive species can have significant impacts to the environment and to our economy, we must work together to reduce their impacts in California.

What's on the DFG Restricted Species List today?

Birds, mammals, frogs, toads,

About the Speaker



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