What is eelgrass?

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Biodiversity & Genetic Diversity
Essential Habitat? ...... Noxious Weed?
Sometimes it disappears from where we want it to be.
Sometimes it exists in places we don't want it to be.
But what is it?
Eelgrass species in Washington
Zostera marina - “native eelgrass”
Zostera pacifica - “wide eelgrass” (unverified)
Zostera japonica - “Japanese eelgrass”
Ruppia maritima - “widgeon grass”
Zostera marina
Zostera japonica - “Japanese eelgrass”

Photo: Susannah Anderson
Ruppia maritima
“widgeon grass”
Zostera marina and Zostera japonica
Eelgrass life cycle

Flowering shoots make flowers and pollen.

Seeds germinate into seedlings.

New leaves grow from inside the plant.

Each leaf occurs at an internode on the rhizome.

New shoots branch at internodes.
Morphological "individual" = ramet
(also called a module)

Genetic "individual" = genet
(which consists of many ramets; also called a clone)

Breaks in the rhizome over time make it impossible to empirically identify a genet. A genet is also referred to as a clone which may continue to grow by vegetative spread over many years. Clonal diversity is thus equal to genotypic diversity, whereas genetic diversity refers to the allelic diversity. In the above example we have one genotype (or one clone).
Two genets of Z. marina?
Three more?
Each pattern represents a different genet. These genotypes or clones can only be identified using highly polymorphic molecular markers (e.g. microsatellite loci). This example shows intermingling of the different clones. Each clone can have a different genetic (allelic) diversity.
How many genets here?
How many are we removing in each experimental plot?
How does “eelgrass” in Washington:

Provide ecosystem services?
Respond to stress?
- nutrients
- disease
- global change
  - temperature
  - sea level
  - acidification
Interact with Aquaculture?
Respond to restoration efforts?
Two possible ways forward:
- Old School: common garden experiments
- New Age: population genetics analysis
Population Structure and Genetic Diversity among Eelgrass (Zostera marina) Beds and Depths in San Francisco Bay

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