Rush Ranch’s Perfect Plants

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Major Stressors are flooding and salinity, degree of severity varies across the marsh.
Cross Section of Rush Ranch’s Tidal Wetlands

Low Marsh
Schoenoplectus acutus, S. californicus, Typha sp.
Inundated twice daily

Marsh Plain (Mosaic of Elevations and Plants)
Schoenoplectus americanus, Sarcocornia pacifica Distichlis spicata
Inundated once daily

Transition Zone
Diverse mixture
Rarely inundated

Adapted from Bertness, 1999
Low Marsh/Tidal Creek
Tule: *Schoenoplectus acutus*
Tule: Schoenoplectus californicus
Cattail: Typha latifolia

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Low Marsh

- Inundation → Anoxia
  (Water-logged soil → No oxygen)

Surviving in low oxygen conditions comes with high energetic cost.

**Oxygen Rich** → **Yields 36 ATP**
Glucose to pyruvate to carbon dioxide

**Anoxic** → **Yields 2 ATP**
Glucose to pyruvate to acetaldehyde to ethanol to carbon dioxide
Low Marsh

- Survival structure = straws in stems and roots

Aerenchyma

Photo by Kim Urbain
Low Marsh

- Methods of moving oxygen to roots

Cronk and Finnessy, 2001
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Adapted from Bertness, 1999
Pickleweed:
*Sarcocornia pacifica*
Salt grass:
*Distichlis spicata*
Salt grass(es)
Secretion of salt ions

Photo by Justin Kitzes, Hopkins Marine Station
Alkali heath: *Frankenia salina*
Arrow grass: *Triglochin spp.*
Suisun thistle: *Cirsium hydrophilum var. hydrophilum*
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Endangered Soft Bird’s Beak: 
*Chloropyron molle molle*
Creeping Wild Rye: 
*Leymus triticoides*
Pepperweed: *Lepidium latifolium*

Invading most areas of the marsh, spreading rapidly
Time to go outside and see them!