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# Rush Ranch's Perfect Plants

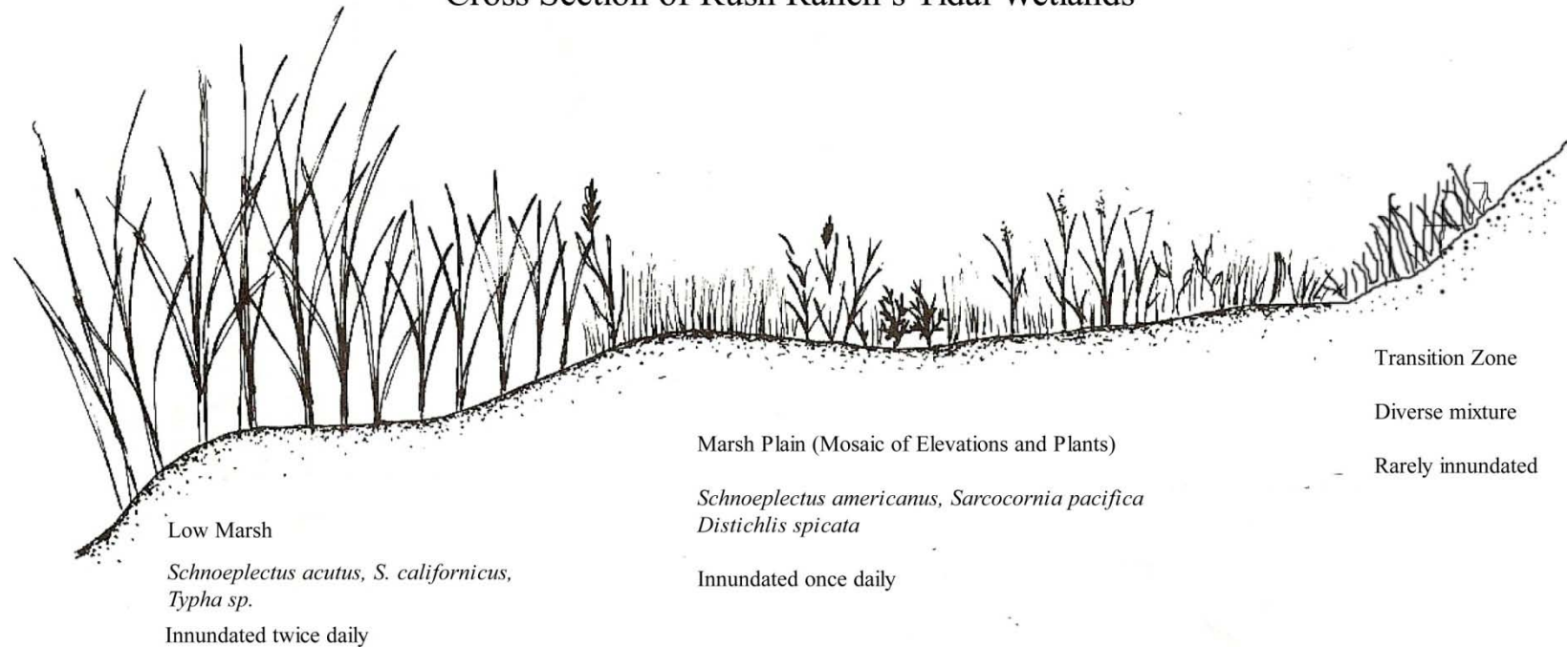


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## Cross Section of Rush Ranch's Tidal Wetlands



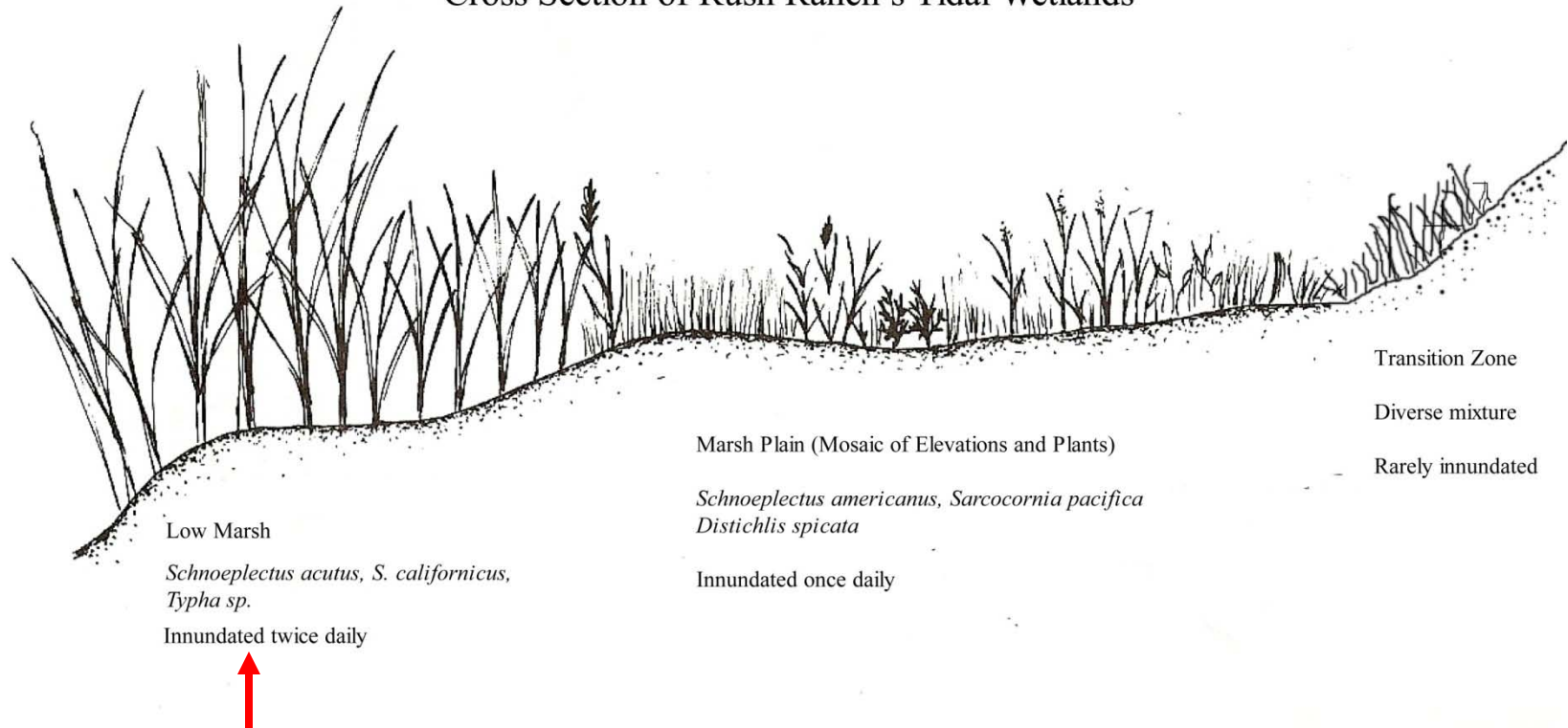
Adapted from Bertness, 1999

Major Stressors are flooding and salinity,  
degree of severity varies across the marsh.





## Cross Section of Rush Ranch's Tidal Wetlands



Adapted from Bertness, 1999







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# Low Marsh/Tidal Creek



**Tule: *Schoenoplectus acutus***



© Br. Alfred Brousseau, Saint Mary's College



***Tule: Schoenoplectus californicus***



© Br. Alfred Brousseau, Saint Mary's College



***Cattail: Typha latifolia***



# 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

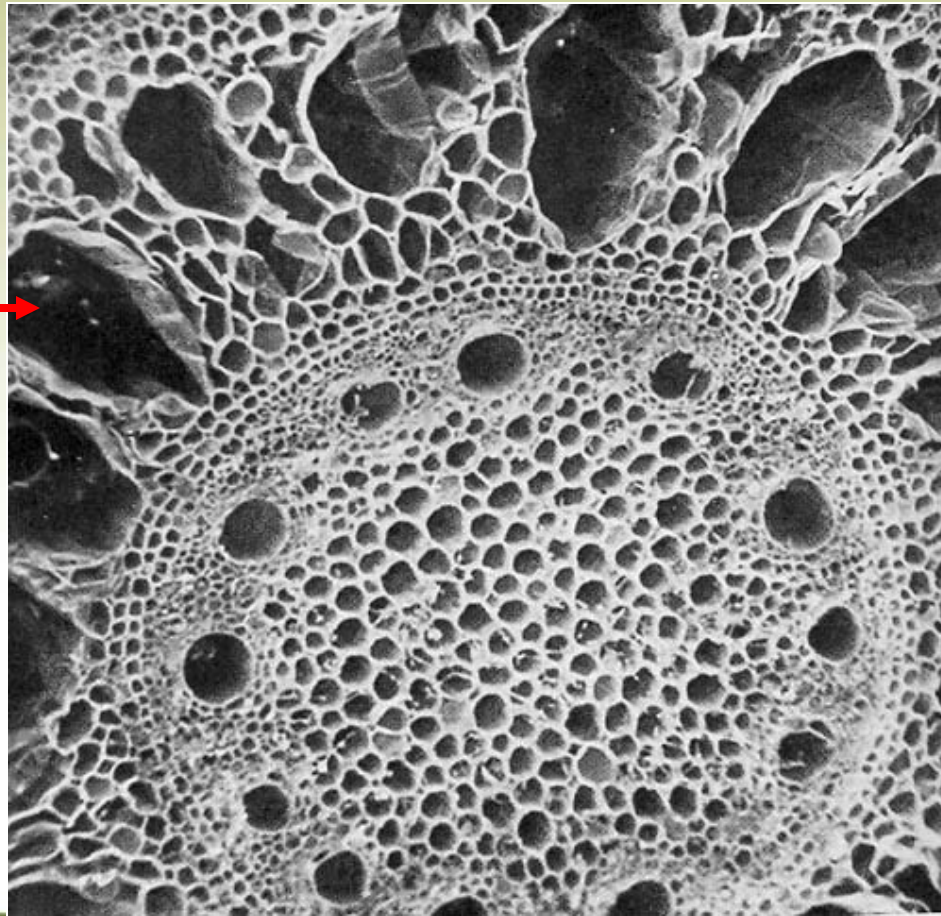






# Low Marsh

- Survival structure = straws in stems and roots

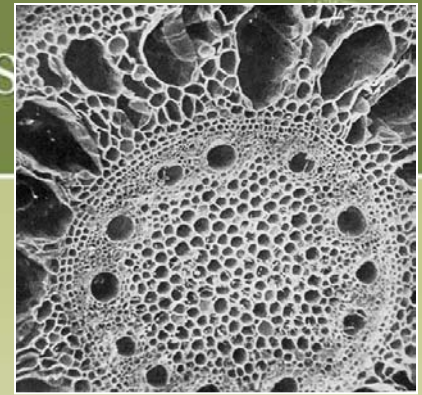


Aerenchyma



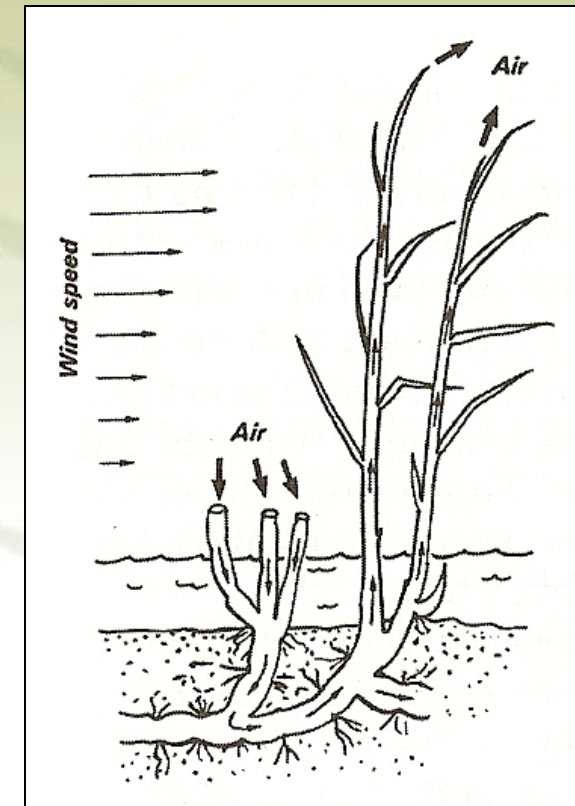
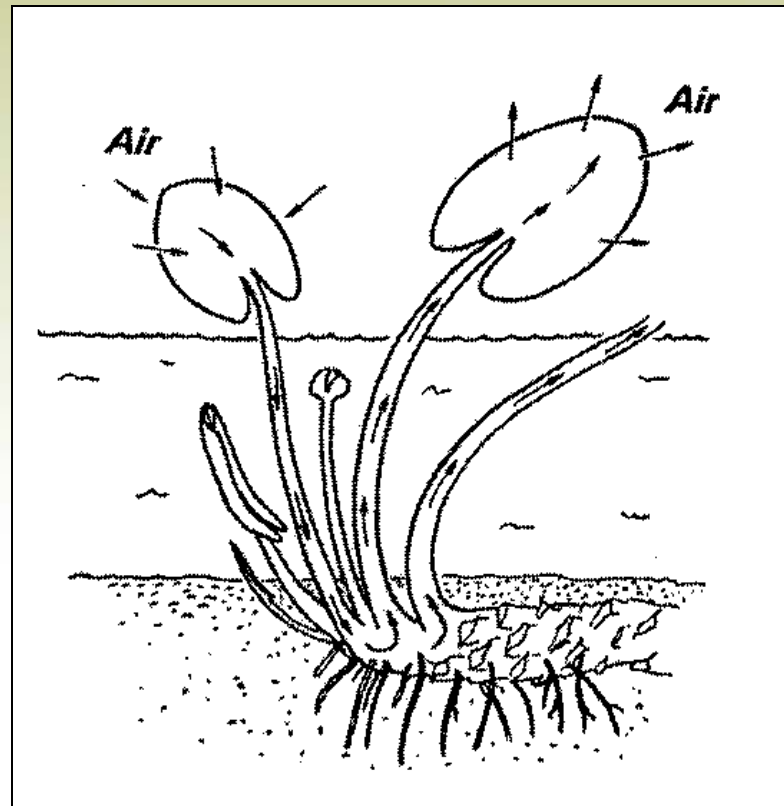
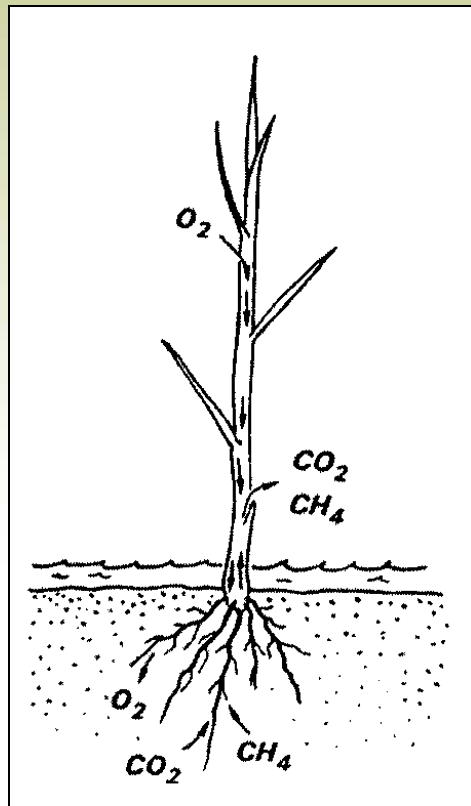
Photo by Kim Urbain





# Low Marsh

- Methods of moving oxygen to roots



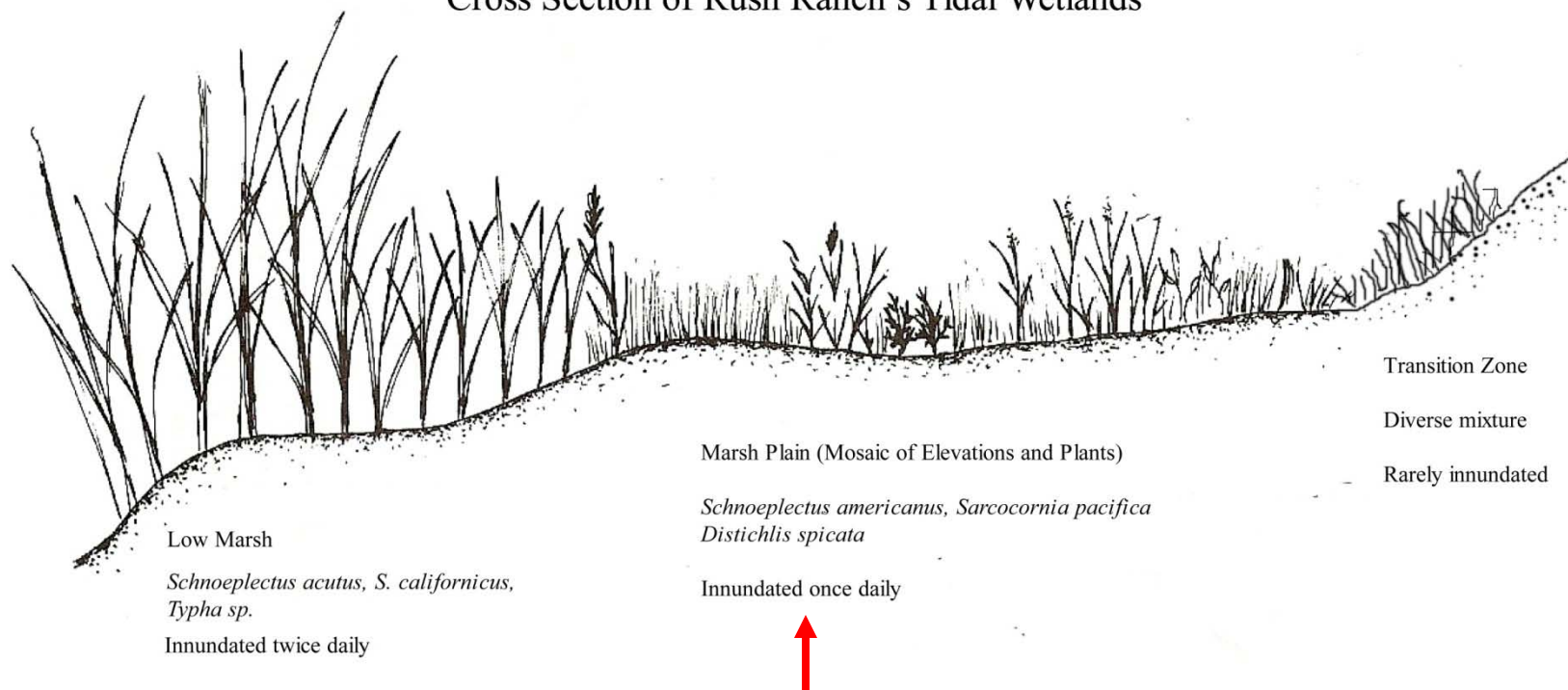
Cronk and Finnessy, 2001







## Cross Section of Rush Ranch's Tidal Wetlands



Adapted from Bertness, 1999





**Pickleweed:**  
***Sarcocornia pacifica***

**Gerald and Buff Corsi © California  
Academy of Sciences**





**Salt grass:**  
***Distichlis spicata***

**Gerald and Buff Corsi © California  
Academy of Sciences**

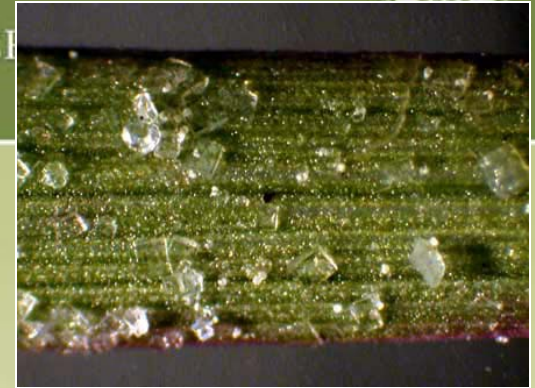


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# Salt grass(es)

Secretion of salt ions



© Michael "Mr. Mike" Rigsby

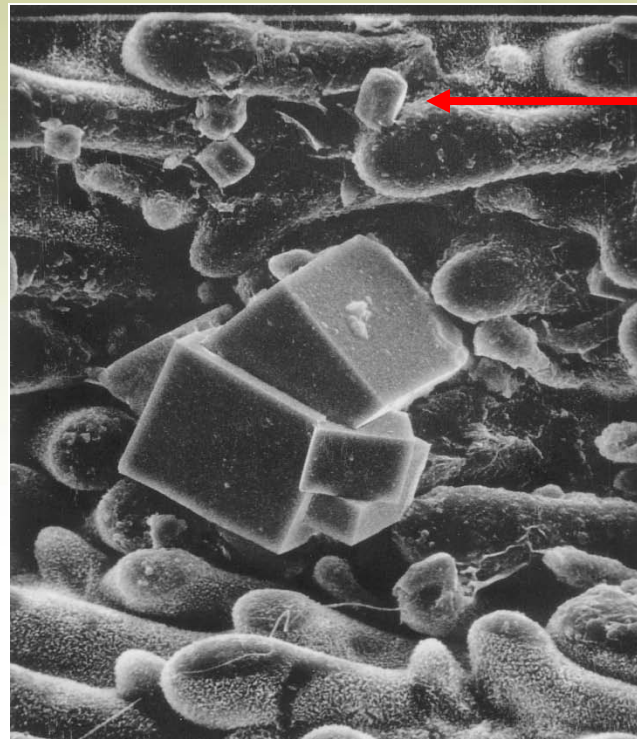


Photo by Justin Kitzes, Hopkins Marine Station







**Alkali heath:**  
***Frankenia salina***

© Br. Alfred Brousseau,  
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**Arrow grass:**  
***Triglochin spp.***

© Br. Alfred Brousseau,  
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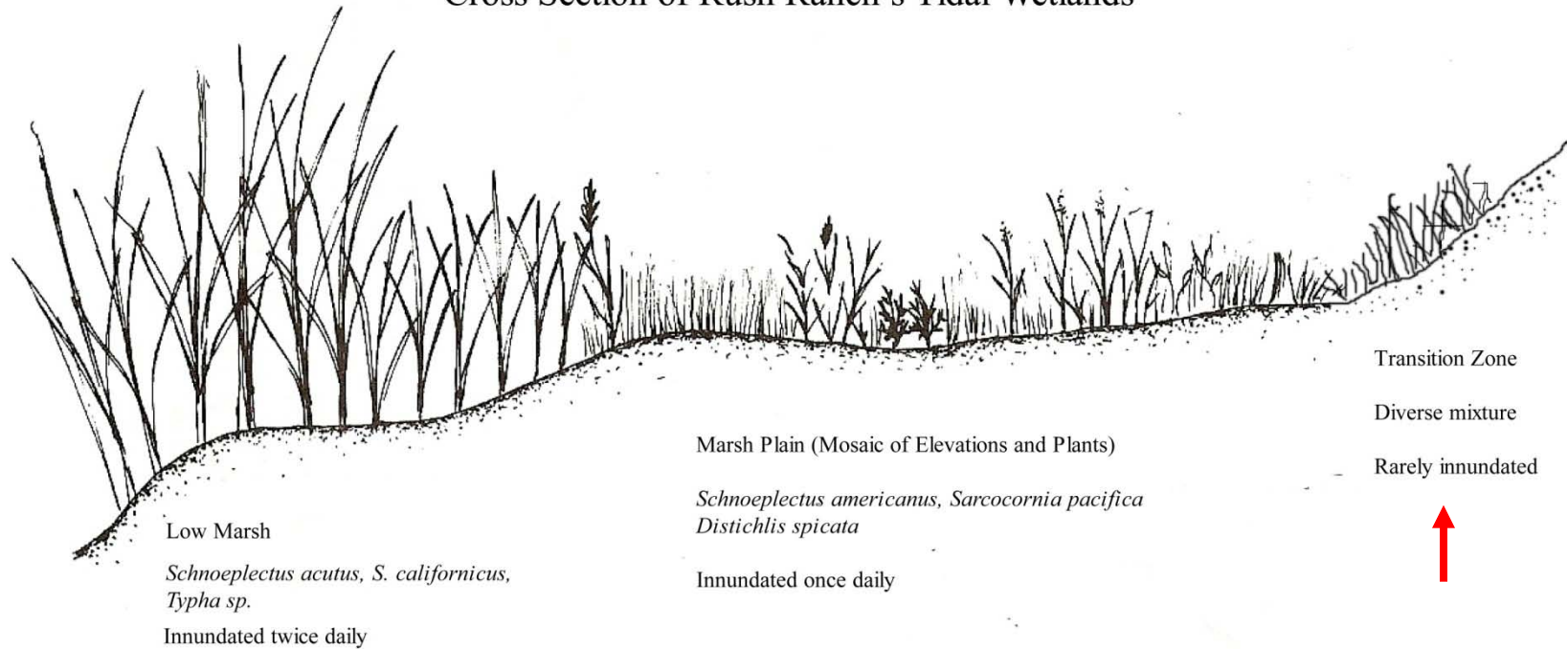


**Suisun thistle:**  
*Cirsium hydrophilum* var.  
*hydrophilum*)





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Adapted from Bertness, 1999





# Endangered Soft Bird's Beak: *Chloropyron molle molle*





**Creeping Wild Rye:**  
***Leymus triticoides***

© 2006 Laura Ann Eliassen





## Pepperweed: *Lepidium latifolium*

Invading most areas of  
the marsh, spreading  
rapidly









# Time to go outside and see them!

