

# **Drought Changes in the Gualala River Estuary's Summer Lagoon: Native Aquatic Vegetation versus Algal Blooms**

A virtual field trip with questions and answers – (more than you wanted to know)

Friends of Gualala River, August 2021

Peter Baye, Ph.D, Coastal Ecologist, Botanist







*Question:*

**What is all the green stuff in the Gualala River lagoon? Is it one of the “Harmful Algal Blooms” in the news? Is it an invasive non-native species?**





## ***Answer:***

No. Most of these green masses are colonies of a native submerged aquatic plant, **widgeongrass** (*Ruppia cirrhosa*). Widgeongrass is not an invasive non-native species or algae, nor is it a true grass. It is a native “seagrass” found in estuaries around the world.





Wigeongrass is rooted in the bed of the lagoon. It grows in clean water with high clarity. It spreads by runners growing on the lagoon bed. Its shoots form an underwater canopy that floats. When the water is shallow, the top of the floating canopy reaches the water surface early in summer.





Wigeongrass canopies, like those of other linear-leaved pondweeds and seagrasses, provide rich, sheltered feeding habitat for small estuarine fish (like native stickleback, shown here), as well as juvenile salmonids. Many invertebrate prey of fish graze in submerged seagrass “meadows”





The underwater slender shoots and linear leaves of wigeongrass resemble grasses. They need light, and depend on clean, clear water. Abundant green wigeongrass is an indicator of high water quality, with low turbidity, unlike soupy green water of single-celled algal blooms. Wigeongrass shoots produce oxygen and remove nutrients.





Wigeongrass is a true flowering plant that forms seeds, unlike algae. The pollen-bearing flowers of spiral wigeongrass (*Ruppia cirrhosa*), emerge from the top of the floating canopy. This species is prevalent on all Mendocino Coast river estuaries and lagoons.





The seed-bearing immature fruits of spiral wigeongrass are born on very distinctive long, coiled stalks held under the water surface. The long coiled stalks are the reference of the common name, spiral wigeongrass. The more widespread species of wigeongrass has short, usually straight stalks.





Spiral wigeongrass pollen released is often blown by wind-waves and collects as creamy foam-lines at the edges of floating colonies. Pollen decays rapidly. Decaying pollen foam can become covered with minor algae and bacterial mats.





***Question:***

**Why are the widgeongrass colonies in the lagoon so much more extensive than usual this year (2021)?**





### ***Answer:***

During high winter flows that scour the river bed and deposit gravel bars, most of the perennial wigeongrass buds in the lagoon bed are eroded or buried.

During winter droughts, there is little disturbance of the gravel bed. A lot more wigeongrass survives the winter than usual, and starts growth early.





*Question:*

When  
wigeongrass  
colonies are so  
massive, don't  
they become  
problem for  
water quality  
and fish habitat?





## ***Answer:***

Normally, no, but sometimes, especially during droughts, dead masses of wigeongrass in shallow water can be a problem. But wigeongrass *itself* doesn't cause water quality problems. Water quality problems are caused by extreme low flows and lagoon levels magnifying natural effects of decaying wigeongrass.



October 2007 – deep, full cool Gualala lagoon



When the lagoon is deep and well-supplied by average summer freshwater inflows, wigeongrass grows unseen most of the summer below the surface, and reaches the surface only by late summer or fall. During the day, it produces abundant oxygen, and takes up dissolved nutrients, improving water quality as well as sheltered food-rich habitat for small fish.



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When the lagoon is very shallow, and freshwater inflows dry up, falling low water levels strand widgeongrass and concentrate it in small volumes of water.

When it dies back in mass in late summer, in shallow, warm water, rapid decay can cause water oxygen deficiency (hypoxia).





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Wigeongrass is fully aquatic, not an emergent marsh plant. When it is exposed to air and sun, or very shallow water, its shoots overheat or dry, die back, and decay. The high mass of decaying dead wigeongrass shoots, stranded by drought-drawdown of the lagoon, can reduce water quality (hypoxia; low oxygen), especially in warm water.





When widgeongrass canopies on the warm water surface die back, green algal mats often grow on the nutrients released by decaying widgeongrass.





These are *secondary* algal blooms that mask decaying wigeongrass canopies below. Attached green algae warm in the sun and block sunlight below them, accelerating the late-summer seasonal dieback of wigeongrass. But they are not the same as “Harmful Algal Blooms” associated with poor water quality and high nutrients.





## ***Question:***

Are wigeongrass blooms ever harmful to people, wildlife, or pets like harmful algal blooms?

***Answer:*** No. They are not only non-toxic, they are preferred food of many waterfowl species.



# ***Question:***

**Is wigeongrass only in the  
Gualala River lagoon? What  
about other Mendocino river  
estuary lagoons?**

Navarro River  
Estuary, August 2010



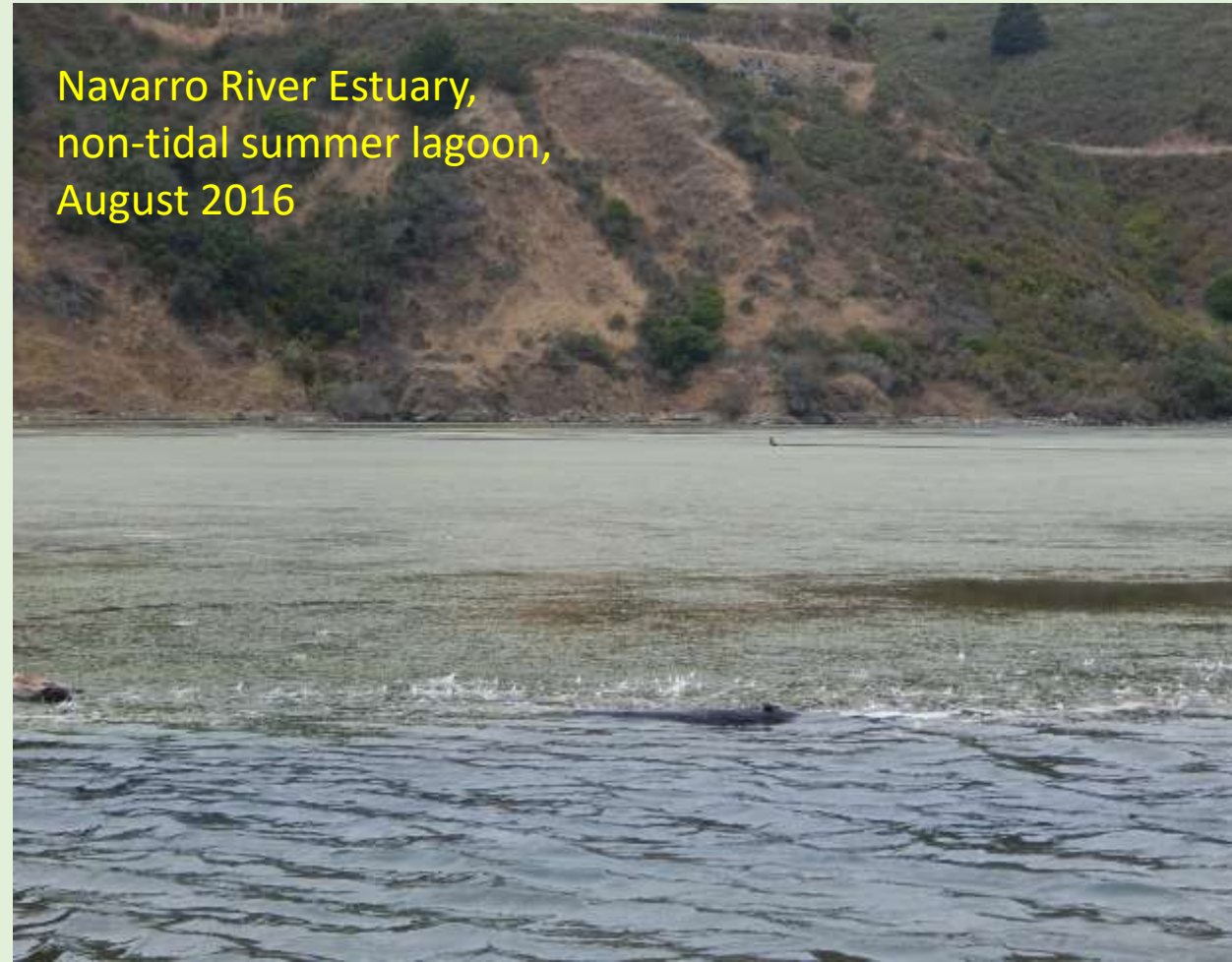


**Answer:** Wigeongrass is common in every Mendocino estuary lagoon that naturally closes in summer. It also grows in upstream, brackish reaches of healthy Mendocino tidal river estuaries.

Albion River (tidal)  
Estuary, August 2017



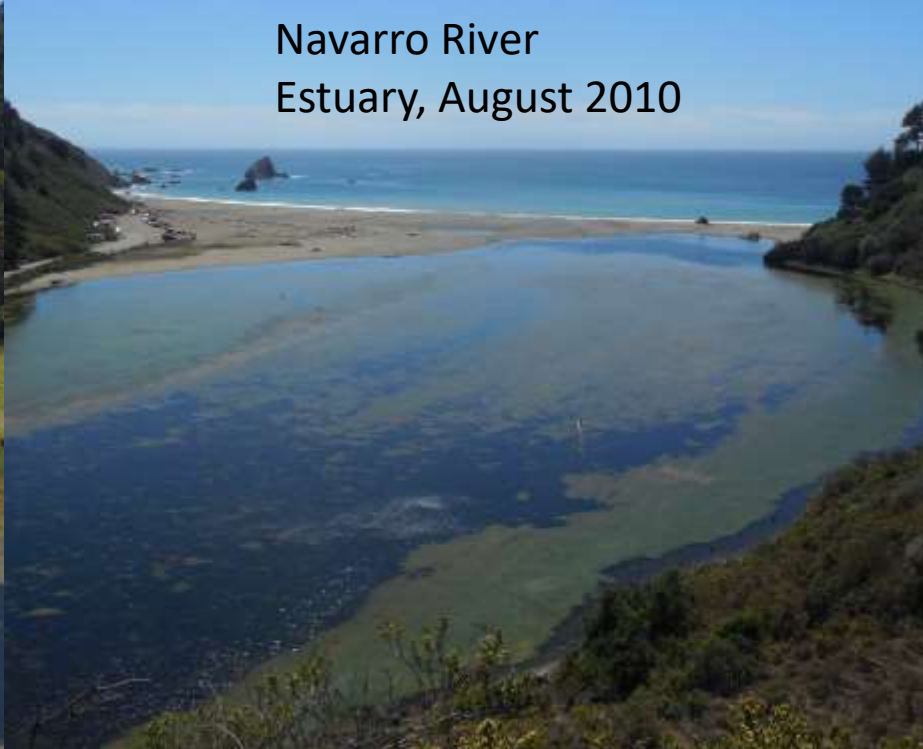
Navarro River Estuary,  
non-tidal summer lagoon,  
August 2016







Navarro River  
Estuary, August 2010



Navarro River  
Estuary, August 2010



Sago pondweed

In fresh to brackish summer lagoons behind beaches that normally close in summer, like **Navarro** and **Gualala**, wigeongrass occurs with sago pondweed. In tidal estuaries with mud beds like Albion, Big River, and Ten Mile River, wigeongrass grows upstream of native eelgrass beds.