

WEST BASIN MUNICIPAL WATER DISTRICT

AUGUST 6, 2003 - Water Resources  
McDonald, Little

AUGUST 25, 2003 - Board Meeting

Prepared by: Jennifer Bender

Submitted by: Richard Nagel

Approved by: Darryl G. Miller

CONSENT CALENDAR

### WETLANDS UPDATE

#### SUMMARY:

During the July Board meeting, staff began a series of topics that studied what is involved in constructing a wetlands from the bottom up - the focus was on wetland soils. This month the types of wetlands plants that can grow in these unique soils - hydrophytes will be discussed .

The broad definition of Hydrophytes includes any water loving plant, or plants normally found in wet habitats. Hydrophytes grow in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content. There are three main types of hydrophytes found in wetlands, submersed, floating, and emergent.

#### **Submersed**

Submersed wetlands plants are completely submersed under water. They are typically leaf shaped and ribbon like. Although they have a large surface area, they are not very resistant to the wetlands current that helps prevent plant damage. These plants rely on the water surrounding them for their support. Examples of this type of plant include Stonewort and Sago Pondweed.

#### **Floating**

There are two types of floating plants, neither of which resemble typical land-based plants at all. Free-floating plants have no ground support - most of their body is above the water surface with their roots hanging free in the water. They easily move around with the wind currents, such as Water Hyacinth and Water Fern.

Floating-rooted or floating-leafed plants have their leaves floating on the surface, but their roots are anchored below in the soil. Leaves are usually circular and resistant to tearing. The large surface area is non-resistant to the current to prevent plant damage. The leaf surfaces are tough and leathery to withstand varied weather conditions. Common examples include the White Water Lily and Floating Pond Weed.

#### **Emergent**

An emergent wetlands plant has its roots and basal portion growing underneath the surface of shallow wetlands water, but its leaves and stems primarily in the air. These species usually line the edges of wetlands and include bulrush, cattails, rushes, and

sedges. Emergent plants have rigid cell walls and are rigid to maintain stability in the wind.

### **Characteristics**

Hydrophytes exhibit some unique characteristics whether they float, are submerged, or grow above water.

#### Heterophylly

Aquatic plants that grow in shallow, submerged habitats experiencing water fluctuations can undergo heterophylly - the occurrence of multiple leaf types on the same plant. This phenomenon is most common in aquatic plants and can make accurate plant identification difficult.

#### Oxygen Exchange

This is the biggest challenge for submerged hydrophytes but is resolved by the presence of an airy tissue found in the roots called Aerenchyma. These large pore spaces extend from the plant shoots down to the plant root allowing the transport of gases and oxygen to the submerged roots. Submerged plants also obtain dissolved oxygen and carbon dioxide from the water column through their leaves.

Some emergent plants exchange oxygen for carbon dioxide through lenticels, blister-like pores that perforate roots and woody stems. These pores are lightly packed and contain lots of air, leaving space for the exchange of gases between the atmosphere and the internal tissues of the plants.

Floating plants, as well as some emergent plants obtain oxygen from the atmosphere through stomata, microscopic pores found on the underside of leaves and stems. These pores diffuse oxygen along a concentration gradient down into the root system.

#### Water Roots

Plants experiencing long-term water logging tend to grow water roots, formally called adventitious roots. These roots grow in positions where roots are not normally found, but are important for stabilizing plants and increasing nutrient and water uptake. Willow trees typically grow these water roots.

#### Reproduction

Hydrophytes can reproduce sexually (seeds) or asexually (clones), but have a propensity for asexual reproduction. Some mechanisms utilized for cloned reproduction include horizontal runners, rhizomes, or stolons, stem fragments, turions (apical buds), and tubers.

Wetlands plants also supply detritus (dead plant material) as nutrients in the food web, provide refuge for plankton, larval fish, and aquatic macroinvertebrates, help shade the water column, reduce wind and current impacts on sediment suspension, and provide aesthetical qualities as well.

Next month the water balance that occurs in wetlands will be discussed.

FISCAL IMPACTS:

None.

ENVIRONMENTAL COMPLIANCE:

Not applicable.

COMMITTEE STATUS:

This item was reviewed by the Water Resources Committee on August 6, 2003 and agendized to the August 25, 2003 Board meeting Consent Calendar.

RECOMMENDED MOTION:

This item is for information only.

LIST OF EXHIBITS:

None.

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