

# INTRODUCTION TO WETLANDS



## WHAT ARE WETLANDS?

Living in the desert, it is difficult to imagine a wetland. Unlike our hard, dry desert soils, a wetland is a place with soggy ground, pungent, moist smells and lush, green plants. A wetland is very different from the desert! In the desert, natural wetlands are rare but they do occur. A small backwater beside a desert stream, a seasonal pond or spring and a marshy cienega are all types of wetlands that might occur within the desert environment.

While there are many different kinds of wetlands worldwide, all have three identifiable characteristics: the soils are saturated, there are hydrophytic (water-loving) plants present, and water occurs there. These conditions do not need to be year-round or constant. Some wetlands change dramatically through the seasons or even (in the case of intertidal marshes) through the day. There may be periodic flooding or drying-up. Some places are considered seasonal wetlands and only exhibit wetland conditions during certain times of the year. Sometimes water is very obvious with a large pond full of fish and ducks. Sometimes the water is just below the surface of the soil and not obvious at all. As the name implies, however, it is the presence of water that makes a wetland what it is.

## TYPES OF WETLANDS

Many types of wetlands occur all around the world. There are coastal wetlands associated with marine estuaries and coastlines. These are mainly salt water wetlands. There are also freshwater, inland wetlands associated with rivers, lakes and ponds. Pond wetlands include bogs and seeps. All these wetlands occur naturally and are influenced by such things as topography, climate and geography.



## WETLAND FUNCTIONS

Wetlands serve several very important roles which scientists call “wetland functions.” Wetland functions contribute to the physical, chemical, or biological health of the environment. Wetlands also have an economic value to humans.



## WETLANDS SERVE IMPORTANT PHYSICAL FUNCTIONS IN THE WATER CYCLE

- They naturally help slow and control flooding.
- They contribute to groundwater recharge.
- They trap sediments which might otherwise impede the water cycle.

## CHEMICAL FUNCTIONS REFER TO A WETLAND’S ABILITY TO CLEAN-UP WATER

- Wetland plants filter pollutants out of the water.
- Wetland plants help settle toxic residue into the wetland soil where they may become chemically neutralized over time.
- Some pollutants are processed by the bacteria living in wetlands.

## WETLANDS ARE VERY PRODUCTIVE HABITATS THAT PERFORM SEVERAL BIOLOGICAL FUNCTIONS

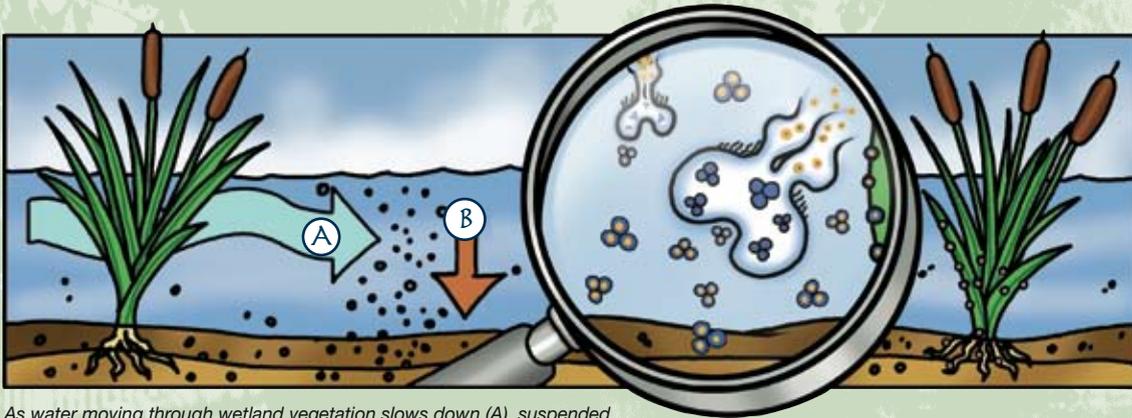
- Wetlands provide resources and nutrients that support a diversity of abundant life in wetlands and the surrounding uplands.
- Wetlands provide important value as habitat – both as nurseries for abundant productivity and as home to a myriad of species, including many that are endangered.

Humans also rely on the economic function of wetlands. Foods such as rice and cranberries are grown in wetlands. In some countries, wetland plants such as peat, reeds and trees are harvested for fuel, fiber or timber. People value wetlands as places for recreational activities such as bird watching, canoeing, or fishing. It is important to remember that humans benefit from all functions of wetlands: physical, chemical, biological, and economic.

## HOW WETLANDS CLEAN UP WATER

As mentioned, a very important function of wetlands is their natural ability to filter and clean water. Water entering a wetland slows down as it moves through vegetation. As the water slows, particles that were suspended begin to fall out of the water and either settle into the soil at the bottom of a wetland or become trapped among the vegetation. These solids might be any type of debris including soil or effluent particles. Frequently, various chemical pollutants—e.g., fertilizers, pesticides, heavy metals and other harmful compounds—are attached to these solids.

Besides slowing the flow of water, wetland plants are able to take up waste water pollutants into their cells. They also create the perfect environment for other processes that cleanse water. The dead plants at the bottom of a wetland pond help trap solids and provide conditions for the growth of important microbes. Microbes also attach themselves to the stems of living plants. Through various processes such as decomposition, predation and neutralization, these microbes are able to transform contaminants into less harmful forms. Microbes also convert various nitrogen compounds into nutrients that help plants grow. The microbes that thrive in the wetland environment literally gobble up pollutants.



*As water moving through wetland vegetation slows down (A), suspended solids fall out of the water (B) and settle to the bottom. Wetlands microbes transform contaminants into less harmful forms.*

## CONSTRUCTED WETLANDS

It is well known that natural wetlands improve water quality and provide important wildlife habitat. For those reasons, wetlands are often built by humans. These “constructed wetlands” are primarily built to clean up wastewater and create wildlife habitat. Constructed wetlands naturally filter and treat wastewater and are often less expensive than traditional treatment plants. Constructed wetlands are also more appealing than other treatment plants because of the habitat they create and because of their ability to reduce odors. In an urban environment where land is scarce, a traditional treatment plant may produce more reclaimed water per acre, but a wetland has numerous additional benefits.

Sweetwater Wetlands is a constructed wetland, built to treat water that is backwashed from the filters at Tucson Water’s Reclaimed Water Treatment Plant. It provides valuable wildlife habitat, supporting numerous species of birds, mammals, amphibians and reptiles. These wetlands also serve as a recreational and educational site for area visitors and residents.

## ACTIVITY: WETLAND WORDS



Directions: Find the wetlands words in this word search puzzle. Be sure to look forward, backward, up, down and diagonally in all directions.

P	B	E	Z	U	R	C	A	T	N	A	S	T	W	M
D	R	A	X	H	T	N	C	P	E	J	I	N	R	I
E	E	E	C	O	N	S	T	R	U	C	T	E	D	N
N	T	C	L	K	L	I	A	T	T	A	C	G	C	V
R	A	C	O	O	W	C	D	N	R	L	T	R	R	A
R	W	E	Y	M	Y	A	E	E	A	S	F	E	H	S
T	T	M	S	C	P	U	S	I	L	E	V	M	W	I
Y	E	E	W	L	L	O	M	H	I	B	B	B	W	V
S	E	R	N	F	W	E	S	V	Z	O	E	U	G	E
S	W	G	F	B	D	Z	W	I	A	R	W	S	D	N
W	S	E	N	W	G	X	Q	S	T	C	D	I	X	G
J	E	N	A	K	C	C	J	W	I	I	O	V	V	U
W	A	T	E	R	S	H	E	D	O	M	O	A	J	M
G	E	C	I	B	O	R	E	A	N	A	F	N	Q	K
R	U	N	O	F	F	Y	O	V	T	M	O	H	I	D

ANAEROBIC

BACKWASH

CATTAIL

CONSTRUCTED

CYCLE

DECOMPOSITION

EFFLUENT

EMERGENT

FOODWEB

INVASIVE

MICROBES

NEUTRALIZATION

RECLAIMEDWATER

RUNOFF

SANTACRUZ

SUBMERGENT

SWEETWATER

WATERSHED