

# Wetland Resources

## Cultural, Historical and Environmental Significance



*Maryann McGraw*  
*Wetlands Program Coordinator*  
*New Mexico Environment Department*  
*Wetlands Program*



# What is a wetland?

(What is a mountain? What is a forest?)



# Definitions

***Wetlands*** – Wetlands are aquatic systems with physical, chemical and biological attributes that are transitional between terrestrial (or upland) and deeper water aquatic systems. In wetland ecosystems the water table is usually at or near the surface, or the land is at some time covered by shallow water. .

***Riparian ecosystems and associated wetlands make up the most dynamic part of the landscape.***

# Wetlands are found under a wide variety of hydrologic conditions

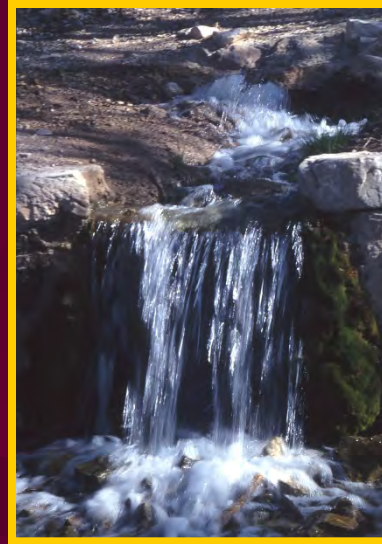


Photo by Danny Davis, NMED





# Grulla National Wildlife Refuge

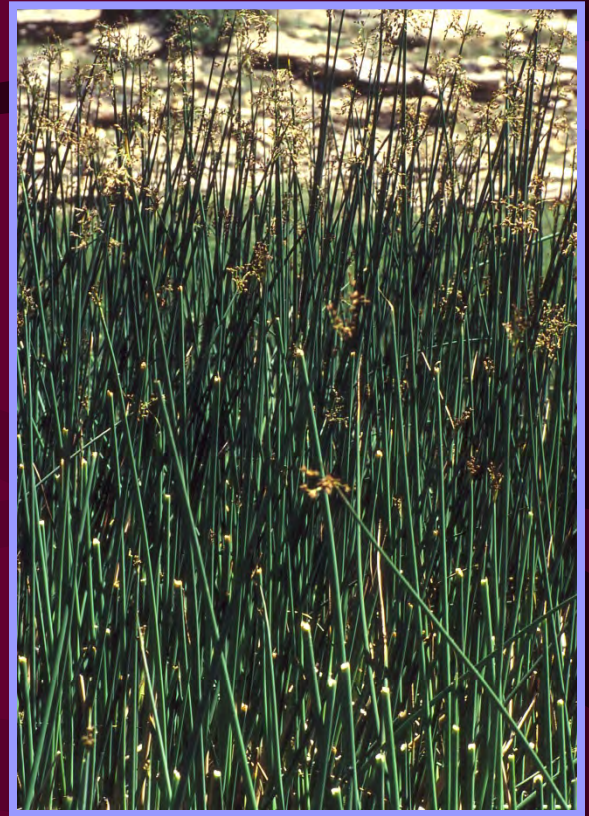


# Definitions

***Wetlands*** – Wetlands have one or more of the following attributes:

- (1) at least periodically, the land can support hydrophytes (plants dependent on saturated soils or a water medium) and other organisms adapted to or tolerant of saturated soils.
- (2) the substrate is predominantly hydric soil or contains hydric soil indicators and/or redoxymorphic features that indicate saturation periodically
- (3) the substrate is non-soil such as bedrock or boulders, and is saturated with water or covered by shallow water at some time during the growing season













©hargreavesphoto.com





# Wetland Soils





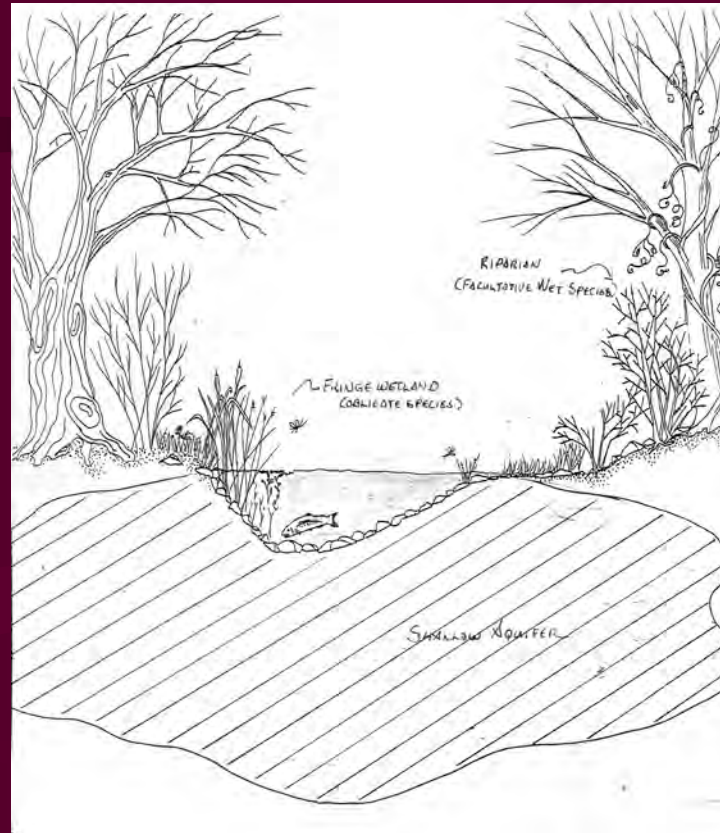
TNC Gila Bird Area



➤ Because of the climatic variability of New Mexico which sometimes includes long periods of drought that dry up even the most persistent water sources, wetlands are not expected to be saturated each year.





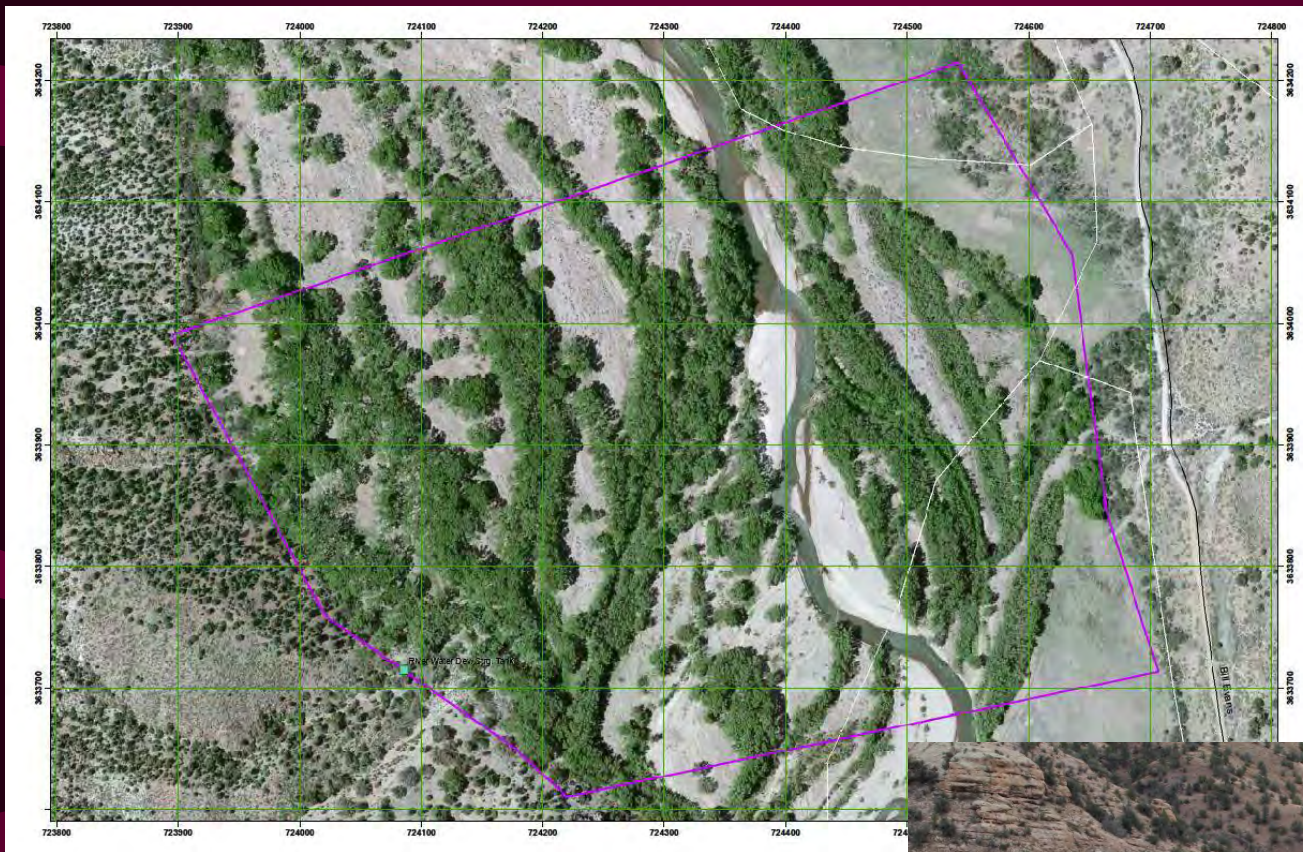


- Because ecosystem services and functions of wetlands are tied to the continuum and mosaic of the entire ecosystem, the hyporheic zone (local water table) is also part of a wetland. Linkages include exchange of water and materials along vertical surface/subsurface (hyporheic) water exchanges.

# Riparian

- intrinsically connected to and interdependent on the water sources and hydrologic regimes that also support wetlands.
- include entire floodplains able to support vegetation dependent on runoff and overbank flow, scour, sedimentation, infiltration and shallow groundwater.
- include somewhat drier portions of a wetland ecosystem and are characterized by phreatophytic and mesophytic vegetation and habitats also associated with flowing or stationary bodies of water.
- They are dependent on existence of perennial, intermittent or ephemeral surface water and/or hyporheic zones.
- occupy the same areas of the landscape as wetlands, may contribute to the same functions within the landscape, and are interdependent, and, therefore, are considered together as part of a wetlands ecosystem.





# Gila River in New Mexico



# Wetland Functions

**Processes that take place in a wetland are defined as functions. (Novitski et al 1993)**

- Wetlands perform important environmental functions.
- Different types of wetlands perform different functions or the same functions to various degrees (Johnson 2005).
- Wetland ecosystem functions are processes that are necessary for the self-maintenance of a wetland ecosystem and can also influence adjacent ecosystems.







# Functions of Riverine Wetlands

## PHYSICAL

- Floodwater retention
- Flood abatement
- Groundwater recharge
- Energy dissipation

## BIOLOGICAL

- Wildlife habitat
- Conservation of biodiversity

## CHEMICAL

- Stream temperature modification
- Organic Carbon export
- Nutrient transformation and recycling
- Sediment retention

# Physical Functions

**Dynamic Surface Water Storage:** This function is the ability of riverine wetlands and riparian zones to arrest moving waters during overbank flows and/or overland inputs during a storm event. Water is routed or stored under the influence of surface and subsurface flows during these events.





# Physical Functions

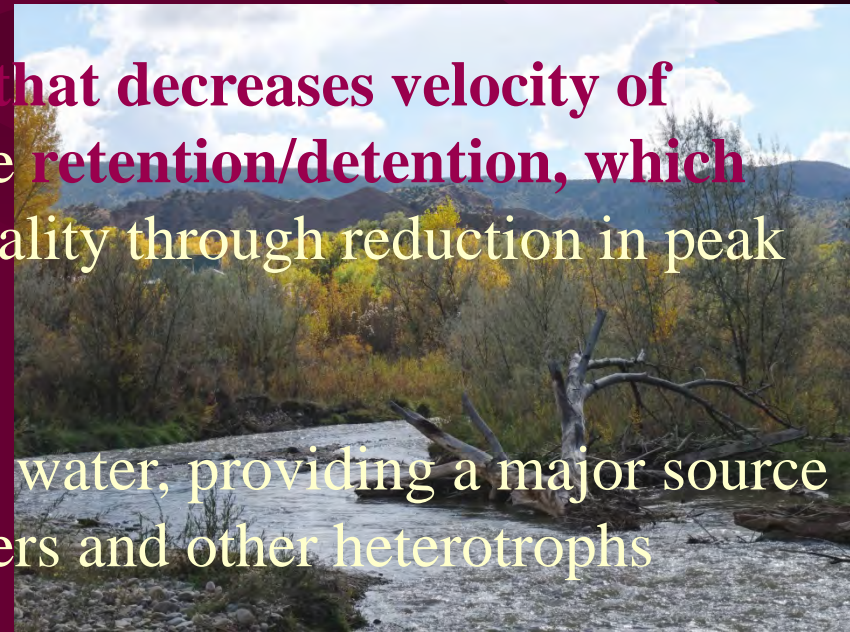
**Ground Water Recharge:** Increased residence time of surface water in wetlands allows infiltration and percolation into soil column, hyporeic zone and geologic formations.



# Biological Functions

**Maintain Characteristic Detrital Biomass:** The capacity of a wetland to produce, accumulate, and disperse dead plant biomass of all sizes either on site or from upslope and upgradient.

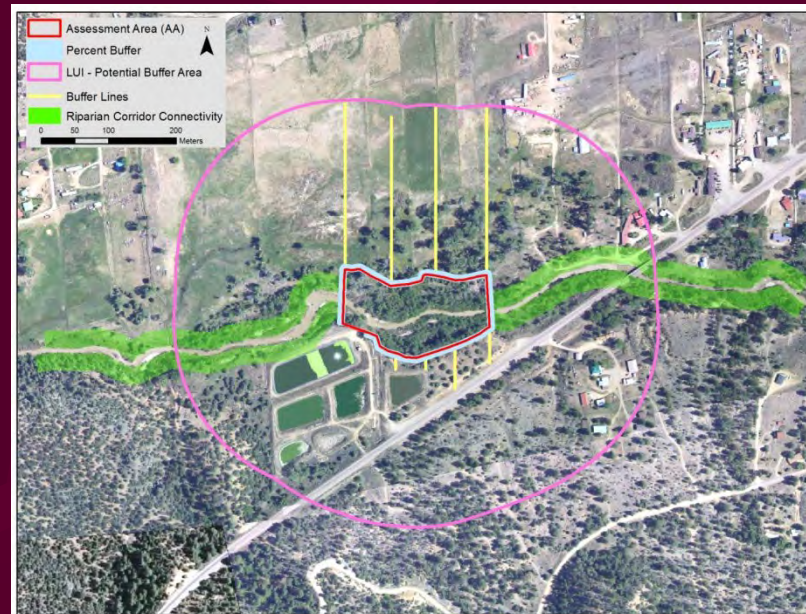
- Larger woody debris provides important resting, feeding, hiding and nesting sites for animals, and can create debris dams playing an important role in the dynamics of floodplain-stream ecosystems.
- Detritus provides surface roughness **that decreases velocity of floodwaters, allowing for particulate retention/detention, which contributes to downstream water quality through reduction in peak flows and sedimentation.**
- Detrital Biomass stores nutrients and water, providing a major source of energy and habitat for decomposers and other heterotrophs (Brinson, Mark M. 1995).





# Biological Functions

**Maintain Interspersion and Connectivity:** This function is a landscape feature that maintains the habitat interconnectivity and proximity necessary for characteristic plant and animal diversity and abundance. This includes the potential for a wetland to provide scattered conduits to a river for aquatic organisms through overbank flow, hyporheic flow, and permanent or ephemeral channels and the wetland's capacity to provide habitat corridors for terrestrial or aerial organisms.



# Chemical Functions

**Removal of Imported Elements and Compounds:** Wetlands are well documented as interceptors of nonpoint source pollution often referred to as the capability of a wetland to act as a “sink” for pollutants. More specifically, this is a wetland’s ability to remove elements (macronutrients and heavy metals, etc.) and imported materials (herbicides, pesticides, oils, salts, etc.) either long-term or permanently from incoming water sources. (Brinson, Mark M. et al. 1995) (Hauer, Richard F., et al. 2002).





# Chemical Functions

(Mitch and Gosselink 2007)

- Wetlands serve as sources, sinks and transformers of chemicals depending on the wetland type, hydrologic conditions and length of time wetland has been subject to chemical loading.
- Wetlands are characterized by seasonal patterns of nutrient uptake and release. Greater during the growing season because of microbial activity in the water column and sediments, and also by macrophyte productivity.
- Wetlands exchange chemicals with adjacent ecosystems that significantly affect both systems.
- Anthropogenic changes have led to considerable changes in chemical cycling in many wetlands.

# Wetland Values and Benefits

- **Wetlands**
  - **Sustain life**
  - **Stop erosion**
  - **Filter out harmful substances**
  - **Provide food**
  - **Recharge groundwater**
  - **Provide recreation**
  - **Spiritual Values**





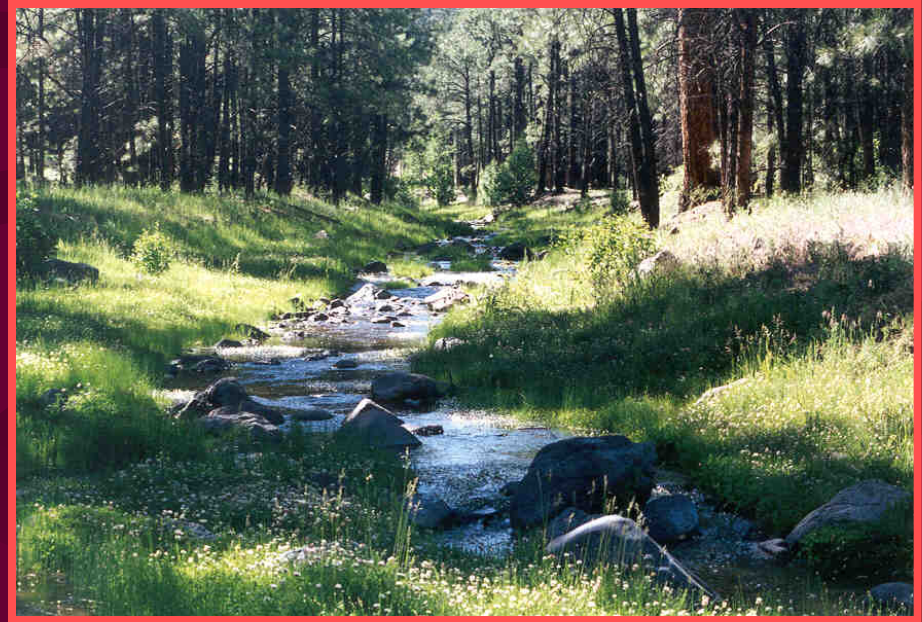
# Wetlands sustain life

- Highly organic, mineral rich soils underlie wetlands
- Cattails , reeds, and bulrushes provide excellent habitat for waterfowl and other small mammals, such as red-winged blackbirds, great blue herons, otters and muskrats.
- Cottonwoods and willows are home to yellow-billed cuckoo and southwestern willow flycatchers.



# Wetlands stop erosion

- **The presence of wetlands in a watershed helps to reduce damage caused by floods by slowing and storing flood water. As water moves slowly through a marsh, sediment and other pollutants settle to the substrate, or floor of the marsh.**





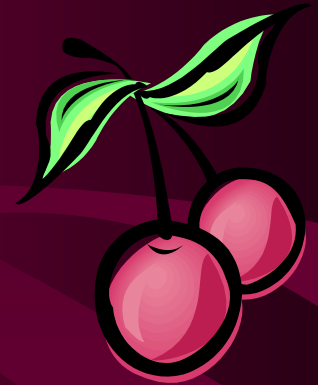
# Wetlands filter out harmful substances

- Wetland plants take up nutrients and sometimes metals so they will not accumulate downstream
- Wetland vegetation and microorganisms use excess nutrients for growth that can otherwise pollute surface water such as nitrogen and phosphorus from fertilizer.



# Wetlands provide food

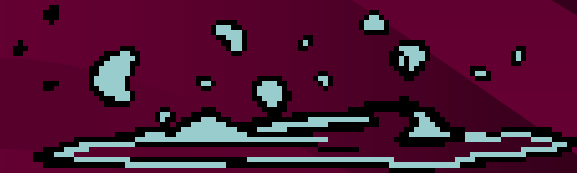
- Some foods that are grown in wetlands
  - Celery
  - Cranberries
  - Wild rice
  - Mint
  - Cattail Flour
  - Marshmallows





# Wetlands recharge groundwater

- Wetlands recharge groundwater supplies and moderate streamflow.
- Water is allowed to stay in one place, allowing for time to sink into the soil.



# Wetlands provide recreation areas

- Wetlands are popular areas to hike, fish and camp.
- Wetlands are also interesting places to watch wildlife.





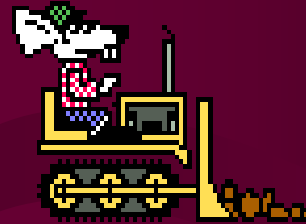
# Spiritual and Cultural Values



# Impacts Causing Decline and Disappearance of These Ecosystems

- *Ground water pumping lowering water tables*

- *Vegetation Removal*



- *Development*



- *Livestock and wildlife grazing*





# Impacts Causing Decline and Disappearance of These Ecosystems

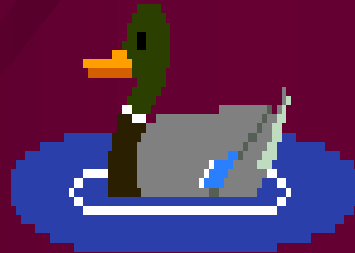
- *Agriculture*



- *Introduced exotic species*



- *Flood control*



***So What Can We Do About It?***

?

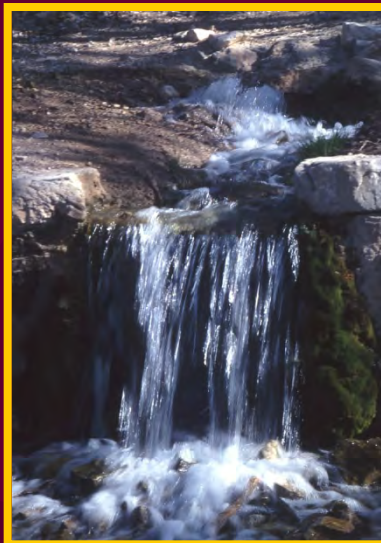


***Thank You!***

**Playas**



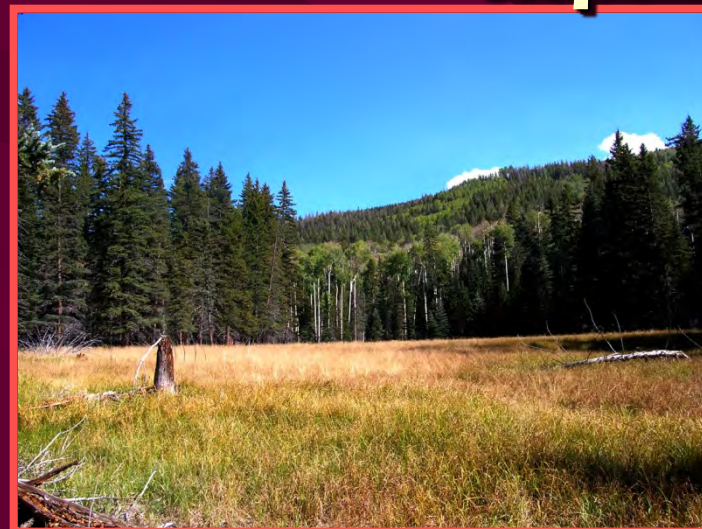
**Springs**



**Riverine**



**Slope**



**Lacustrine**



Maryann McGraw, Wetlands Program Coordinator

[maryann.mcgraw@state.nm.us](mailto:maryann.mcgraw@state.nm.us)