

## The Marsh

With the burbling calls of the sandhill cranes fading into memory until another fall, and the last of the snow geese filling the skies above the marshes at Bosque in their circling and settling, circling and settling "practice sessions" before flying north, one's gaze falls upon the pond filled with cattail and bulrush just east of the Visitor Center. The big birds are gone for the summer — of what use is this water now with all its tall, ragged cattail sentinels bending to the wind and bleaching in the sunshine?

In past years indeed that water would have been treated as having done its job, and all those marshes and ponds would have been drained. Summers at Bosque used to be acres of drying bogs rimmed and mottled with crusty dissolved salts and decaying vegetation, like so many useless, lifeless bodies left to rot upon the earth.

But in the interest of providing food for the wild things year 'round, wildlife specialists scratched their heads and chewed their pencils and came up with the idea of Moist Soil Management which utilizes natural resources on a twelve-month basis and which allows Nature itself to feed and protect its creatures.

Let's start with that pond filled with cattails. Biologists say that represents full maturity of a marsh — it no longer produces edible plants for water fowl (although those reeds provide excellent thermal protection from the cold for the wintering ducks and great hiding places in the spring for the fuzzy young goslings that paddle around behind their parents. Nesting is safe there, and delicious bugs hide in the leaves and stalks). A heartening note: in nature everything is useful and worthwhile! Surely that applies to US as well.

In moist soil management theory, that selected mature marsh/pond will be drained about April or May and allowed to dry sufficiently for machines to come in and disc and harrow it until all the soil is broken up and open to the air and the plant material is composted or removed. We recall that because of Bosque's great "plumbing," water from the river enters the refuge at the northeast corner and flows across the fields and ditches draining at the south-west corner, taking dissolved salts and disease germs away from the refuge into a large water-body area where they cannot concentrate.

Come fall that marsh area is again flooded, but not too deeply, to serve as a roosting or loafing area for the birds. Maybe for eighteen months that marsh is kept flooded after all the perennial vegetation has been removed; and then in early spring the flood waters are drawn down again slowly and the annual grasses have their turn. Those seeds have been lying dormant in the "seed bank" or have been brought in by the river waters or even by the birds on their feathers or in their droppings—and those seeds begin to grow in the warmth of spring sun in that fertile moist soil. And what grows? Millet and sprangletop, smartweed, and the favored yellow nut grass or chufa, and about fifteen or twenty other species as well. These grasses, called annuals, grow and flourish for one season only, but the seeds they produce are just what the waterfowl have in mind for sustenance.

In early fall here come the waters again to provide for the waterfowl, but not only can the birds lounge and roost now, but there is great food under water just waiting to be harvested, or even seeds floating on the surface where they have shaken from their seed heads, or maybe growing around the pond periphery where they are available to eager bills.

And then a repeat—another good summer of annual grass growth with the small creatures scuttling through them and the deer fawns lying concealed in them where they can munch the clover that grows there. Another fall and flooding and another spring. If this unit has been productive of many good grasses it may be allowed to stay in grass for three years. At any one time there may be 200-300 acres "out" in grasses, depending on how productive each unit is. Perhaps just over the ditch bank there is an area deeply flooded and another grassy area beyond that.

Eventually the annual grasses have spent their coin and more of the perennial plant seeds are germinating. When about 50% of the area is in perennial plants and 50% in open water it is named a "hemimarsh." Again in September and October the waters come flooding in, but with the soils not entirely level (on purpose) the waters rise slowly, covering first the lower areas and allowing the dabbling ducks to eat off the bottom. You've seen them, their funny tails pointing to the sky as they wrestle with a favorite nibble at bill's reach in the mud at the bottom of the pond. The dabblers can keep up with the waters at a 6" depth, and as the waters deepen they move more to the edges for their dinners. The diving ducks take over the waters that are deepening where they can find submerged vegetation and all sorts of tasty aquatic life.

At this point we are about halfway through the succession of the marsh, with succeeding years seeing more of the perennial plants like the cattails dominating the marsh area along with sedges and willows until at last the marsh becomes "mature" and is no longer producing wildfowl food. (A really overgrown marsh becomes filled with soil and is almost useless for waterfowl.)

So in three stages the marsh moves, with careful management, from "mature" and filled with perennials to cleared and annual grass-producing, and then to the hemi-marsh where one finds about half-and-half each of water and perennial plants. But all year around there is food and/or refuge for the creatures.

A happy note for interested birders: we can tell about the depth of the water or the stage of the marsh by "who" hangs out there. (Or conversely we can tell "who" will be "hanging out there" from the depth of the water.) Shallow waters host mallards, teal, and pintail. In deeper waters we'll find buffleheads, redheads, canvasbacks, ruddy ducks, and ring-necked ducks. And over by the marsh trail area (which is really an old oxbow of the Rio Grande) as well as the area to the south of the two-way road on the tour loop where the waters lie deep we can look for the cormorants and pelicans.

And about that pond right east of the Visitor Center: it is intended to stay a perennial marsh where we can watch the egrets, great blue herons, Canada geese, coots, and some of the ducks. These particular guys don't mind being looked at more closely and are more patient about cars and people and cameras.

So it is with planning and careful management that our Bosque del Apache National Wildlife Refuge has come to life all year long, where we can come to see a great variety of birds and other creatures as they feed and rest, nest and migrate, and share with us in the bounty of the earth that we all call home.