Appendix G

Moist Soil Management Guidelines for Rio Bosque Wetlands Park

(Developed by Ducks Unlimited, Inc. and made an attachment to the License Agreement between the City of El Paso and UTEP)

Habitat Management

Depth: Water depth of individual cells should be maintained at 6-12 inches, and maximum depth within the cells should not exceed 18 inches. Ideally, topography within the impoundments should be varied to create diversity in water depth, a feature that typically attracts a greater variety of waterfowl and wetland wildlife.

Vegetation: The three units created as a result of this project lend themselves very well to the practice of moist soil management. As the phrase implies, moist soil management involves drying and periodic saturation of soils to stimulate growth of desirable species of vegetation, i.e., those that provide sources of food for migrating and wintering waterfowl.

The goal of moist soil management is to create and maintain soil moisture conditions that allow germination and growth of early successional species of vegetation that produce copious amounts of seeds. Species of wild millet (*Echinochloa* spp.), panic grasses (*Panicum* spp.), and certain species of smartweed (*Polygonum* spp.) are examples of plants of value to waterfowl. Generally, in former floodplain areas such as this, seeds of these species occur in the soil seed bank, thus no seeding is required. However, millets in particular may be encouraged by seeding to expedite development of dense stands.

Undesirable species of vegetation may invade the area. Generally, invasions either occur rapidly after draw down by pioneering species such as cockleburr, or slowly as a result of plant succession. Such invasions can be controlled by several means. Identified early (before individual plants attain a height of 3-4 inches), cockleburr and other noxious species including salt cedar may be killed by inundation for a period of about 2 weeks. Taller plants, including salt cedar, may be mowed. This is especially effective when done prior to development of seed heads. Spraying with broad leaf herbicides approved for use in wetlands (e.g., Rodeo) also promotes control of problem species including salt cedar.

Over time, wetland plant species changes may occur due to the process of succession. This natural process may result in development of undesirable plant species composition within the wetland cells. Late successional species typically are perennial plants (as opposed to annual grasses). They often have woody stems they grow back each year from the root base or from aerial woody stems, and the stems persist through winter and often into spring. Perennials may also prevent germination and growth of more desirable vegetation by shading newly germinated plants.

Wetland succession matures usually in seven years. Succession may be set back to the early, more productive stage by several means, including mowing, disking, fire, and via herbicides approved for use in wetlands. Of these, fire is typically the most cost-effective, followed by mowing, disking, and spraying. Mowing and disking probably are most commonly used to disturb the soil and create early successional conditions.

Regardless of management techniques applied, some undesirable species will almost always be present. The objective of management is not necessarily eradication, rather it is control to prevent dense stands of undesirable vegetation from developing. In addition, control of succession assures to a certain extent that the wetland will remain a productive source of food for wintering and migrating ducks.

Ducks Unlimited can provide limited technical assistance pertaining to control of undesirable vegetation. The most knowledgeable and available support will be available from the manager of Bosque del Apache, New Mexico, U.S. Fish and Wildlife Service. Texas Parks and Wildlife personnel may also be available. A site inspection by DU or other wildlife professionals trained in wetland management should be done annually to identify potential management problems.

Flooding and Drawdown Regimes: The primary management objective for this project is to provide habitat for migrating and wintering waterfowl, and to a lesser extent, migrating shorebirds. A secondary objective is to provide potential nesting and brood–rearing habitat for Mexican Ducks.

Flooding and draw down should be done gradually. This allows ducks and shorebirds to consume foods as water moves into new areas within each cell. Gradual draw down is very important, even more so than gradual flooding. Slow draw downs in spring concentrate invertebrates that serve as a primary food source for spring migrant waterfowl and shorebirds.

Management of the wetland cells should vary in a particular cell from year to year avoiding a repetition of the previous year's regime in a particular cell.

Availability of Water: The availability of water in a given year will be verified by contacting the El Paso County Water Improvement District No.1 General Manager and determining the outlook for the year. The availability of water for the year can be verified with the U.S. Bureau of Reclamation, Project Superintendent. Early planning will be necessary to determine what type of flow regime will be permitted.

Drawdown and Flooding

Bosque del Apache Experience: The best experience that Bosque del Apache has had with fall flooding in terms of the maximum extended use of produced wetland foods has been through a progressive flooding schedule of several units at the same time. Flooding for shore birds (7/29-10/12) is planned after units are rehabilitated to reinitiate the succession cycle. Invertebrate production should be high on decaying vegetation matter resulting from mowing, discing and plowing done to reestablish the beginning of a new succession cycle. A continuous flood up through the winter will provide continued emergent vegetation control.

The schedule of each cell should vary from year to year rather than remaining the same perpetually. Assuming that there will be three management units to manipulate, and assuming water is available to flood individual units at will, the following example of flooding and draw down may be appropriate.

Flooding:

Early fall flooding (8/22-10/4) supports early teal during this period.

Mid-fall flooding (10/5-10/31) supports teal, mallards and northern pintail.

Late fall flooding (11/1-12/11) support peak sustained use on moist soil impoundments through November and early December and mainly supports northern pintails and mallards.

One unit should be flooded early in the fall migration period to provide habitat to blue-winged teal, cinnamon teal, northern pintails, and fall migrant shorebirds. The earliest migrant waterfowl to arrive on site in large numbers likely will be blue-winged teal. Blue-winged teal may appear as early as mid-August. Hence, one unit should be flooded in mid to late August, but no later than mid-September, to attract and hold these early migrants. Numbers of early migrants may increase dramatically in September.

Most species of waterfowl begin arriving in this area in October. It would be best to flood two units beginning with one of the two units in mid-October (early October if large numbers of early migrants are present), and the other unit in mid to late November. In so doing, an increasing base of habitat will be provided to increasing numbers of ducks as they move south for the winter. Flooding should be gradual so as to expose new food sources as water levels rise within the units. Flooding up to 1 foot in depth should be accomplished in 2 to 4 weeks.

Flooding in mid to late fall generally attracts green-winged teal, American widgeon, gadwall, northern shovelers, northern pintails, mallards, snow geese, Ross' geese, Canada geese, sandhill cranes, snipe, and a variety of wading birds.

Drawdown: Early spring drawdown (4/12-5/28) leads to germination of smartweed, millet, sprangletop and chufa. Staggered drawdowns during this period will also favor shorebirds with good waterfowl use of concentrated invertebrates expected. Any irrigations will occur if needed in May or June. Spot mowing will occur in late June to control cocklebur and other undesirable vegetation. An additional irrigation will occur in late June or early July following mowing. A final irrigation will occur in early August due to exceptional seed yields when following this irrigation regime.

Late spring drawdowns (5/29-7/13) benefit waterbirds including herons, egrets, bitterns and rails. Millet, sprangletop and Bidens will be the important plants germinating during this period. Spot mowing will be needed in mid-July to control undesirable vegetation followed by a late July or early August irrigation.

Summer drawdowns (7/14-8/20) provide good shorebird habitat.

A key point about draw down, as previously discussed, is that it must be done gradually, i.e., about 1-2 inches per day. Hence, if the maximum depth within a unit is about 18 inches, draw downs should require 3-6 weeks to accomplish. Considering migration chronology of species of waterfowl most likely to occur on the project, draw down should occur as follows:

Begin drawdown on a unit in late February to mid April, complete by the end of April. This will concentrate invertebrates and expose remaining seeds, thereby providing excellent habitat for early and mid season migrant waterfowl and shorebirds. Most waterfowl will be gone from the project by the end of April, with peak numbers of blue-wings departing in late April. Some blue-wings will remain into May, and some may remain to nest. These sites also will provide a concentrated source of invertebrates for nesting female Mexican Ducks, and it will offer brood-rearing habitat for Mexican Duck broods.

Begin drawdown on one unit in early to late March, complete by mid April to early May. This will provide good habitat for migrant shorebirds, late migrant blue-wing teal, and brood-rearing habitat for Mexican Ducks.

Begin drawdown on another unit in mid to late April, complete by the end of May. This will provide habitat for migrant shorebirds, late migrant blue-winged teal, and brood-rearing Mexican Ducks.

There is no substitute for experience when managing any particular site. What works on one site may not work on another. Waterfowl use should increase over the first few years of the project as birds locate the site and "home in" in following years. The above water regime may be altered to better suit the requirements of the birds, and to accommodate migration events that may vary in any given year. Hence, the site should be inspected weekly and waterfowl and other water bird use noted, estimated, and if possible recorded. In doing so, after a few years, patterns of migration and use may become apparent and the site may be managed to accommodate those needs.

Irrigation of Germinated Plants: The group of plants collectively known as moist soil plants requires exposure of wetland soil for germination. After germination, when seedlings are 1-4 inches in height, the cells should be briefly flash flooded to saturate the soils and keep them moist. This will result in optimal growth of the desirable vegetation.

Given the arid nature of this region with associated high evaporative losses of water from the soil, it will be necessary to flash irrigate the soils monthly, or possibly as much as every two weeks at times. The site manager simply needs to check soil moisture. If it is wet to the touch, or damp just below the soil surface, it is sufficiently moist. If it appears hard, dry, or cracked, it should be flash irrigated as soon as possible.

Periodic irrigation of soils should continue until the area is flooded for waterfowl, or until a killing frost occurs in winter.

Burrow Owl

Athene cunicularia