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Best Management Practices for Waterbirds on Agricultural Lands

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Waterbirds occupy an important niche in streamside and wetland habitats. Their presence indicates a healthy ecosystem and can add value to agricultural lands. Agricultural producers with water resources on their land can fine-tune their management practices to enhance wildlife and waterbird populations. Water resources may include a river or stream bank, flooded field, reservoir, shallow water area or farm pond. Best management practices for agricultural production will improve water quality and reduce soil erosion as well as improve waterbird habitat. As with any changes in production practices, it is beneficial to modify a small portion of your operation first to test and refine the practice before applying to your entire farm.

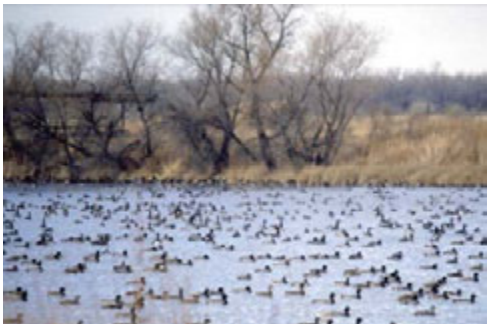

FIGURE 1. Mallards resting at a farm pond.

What Are Waterbirds?

Waterbirds is a term used to describe a group of birds which depend on rivers, lakes, ponds or streams for food and cover. Species include waterfowl, loons, grebes, pelicans, cormorants, anhingas, gulls, terns, wading birds, shorebirds, marshbirds and a few land birds such as Bald Eagles and Belted Kingfishers.

Many thrive on seeds or invertebrates attracted to decaying plant material. Some, like the American White Pelican and Double-Crested Cormorant, eat fish and can come into conflict with aquaculture production. However, most are beneficial to agriculture in reducing weed seeds and insect pests or provide extra farm income through leasing opportunities during duck season. More information about waterbirds can be found at http://www.audubon. org/bird/waterbirds/.

FIGURE 2. The secretive King Rail is a type of waterbird found in Arkansas which nests in weedy rice fields and adjacent ditches.

Best Management Practices

To improve waterbird and wildlife habitat on your farming operation, you will most likely need to make only minor modifications to your practices.

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Consider the following best management practices which will be described in more detail: Nutrient Management, Tillage Management, Integrated Pest Management, Field Harvest Management, and Field Border and Edge Management.

Nutrient Management

As nutrient costs continue to rise, producers are paying closer attention to the cost of nutrient application and return. Good nutrient management practices for growing a profitable crop are very similar to those needed for improving waterbird habitat. Nutrient management that ensures good water quality will benefit waterbirds.

1. Have a written nutrient management plan. Plans can be obtained by contacting your local USDA Service Center or Conservation District Office. This is a starting point for your crop management plan. In addition to the conventional nutrient management considerations, the plan should also include how nutrients affect ground and surface waters and wildlife populations.

2. Use soil testing and manure analysis in making nutrient recommendations. Apply only the nutrients that are needed by the crop. (See *FSA1035, Soil Testing for Manure Management*.)

3. Apply nutrients when and where they can be most effectively used by the crop. A system that allows applications based on nutrient needs will save money and benefit yield as well as improve waterbird habitat.

4. Focus on all important nutrients, not just nitrogen or phosphorous. Potassium as well as micronutrients need to be part of a nutrient management plan. Excessive phosphorous will have a negative effect on surface water quality.

5. Use management practices that prevent movement of nutrients into ground or surface waters. These practices include filter and buffer strips.

Contact your local county Extension office or http://www.uaex.edu for more information about nutrient management plans.

Tillage Management

Tillage systems vary widely across most production systems and crops. However, any tillage practice that leaves crop residue, reduces erosion, and maintains and protects the water and soil will benefit waterbirds. Commitment to long-term reduced tillage systems not only will benefit wildlife, but improve soil health and in many instances crop productivity. Therefore, consider the following when evaluating your tillage systems:

1. Consider a tillage system that will leave residue and waste grains. The residue will protect the soil, and the grains can be used by wildlife as a food source.

2. If tillage needs to be done, conduct it at a time that will have minimal effect on bird populations. This generally means avoiding tillage during the nesting season, which can be until late July or early August, to leave food and cover for brooding chicks.

3. When possible, use a no-tillage system that will reduce trips in the field and soil disturbance. Fewer trips across the field will leave better nesting and resting locations for waterbirds.

Integrated Pest Management

Integrated pest management (IPM) involves using the best management practice that benefits both the cropping system and wildlife habitat. In many cases, IPM uses multiple methods of control that are based on economic and pest thresholds. Prudent use of agrichemicals will benefit the economics of production and waterbirds.

1. Have a written IPM plan for your crops. This plan should include all possible alternatives for pest management, how pest monitoring will be conducted, what thresholds will be used and costs for control activities. You may consider including a section on reducing agrichemical effects on wildlife. Contact your local county Extension agent for details.

2. When using agrichemicals, make sure to follow the label directions, apply the correct rate and use only what is needed. This means using proper calibration and making applications under the right weather conditions to reduce drift. Many times agrichemicals can drift into nontarget areas that will destroy waterbird habitat along field edges.

3. Use the safest practice that will have the least impact on waterbird habitat. For many pests, crop rotations offer the most economical and effective method of control. When possible, avoid using liquid or granular insecticides. Choose herbicides, insecticides and fungicides with low toxicity and good environmental profiles. Since many bird populations depend on insects for food, it is important to select those with minimal effects on beneficial insects.

4. Adopt proactive, ecological pest management solutions such as crop rotation, planting

pest-resistant cultivars, creation of habitat for beneficial organisms and maintaining healthy, biologically active soils.

5. Monitor pest levels, set threshold levels and keep detailed records of IPM practices for future evaluation.

Field Harvest Management

Today's harvesting machinery is much more efficient than even the equipment that was used 10 or 15 years ago. It is important for producers to manage and set up this equipment to be as efficient as possible. However, there are a few simple practices that a producer may consider that can benefit waterbirds and wildlife as well as improve agronomics.

1. Leaving crop residue will protect the soil, and the grains can be used by wildlife as a food source.

FIGURE 3. Soybeans growing in wheat stubble.

2. Increase crop harvest height (the distance from the soil surface to that at which the combine header is run) so that more residue remains during overwintering and early nesting. An exception is rice stubble in which increased height could have a negative effect and limit food accessibility for waterbirds. Rice stubble is poor nesting habitat. In early spring some birds might nest in taller stubble that will be disturbed for field preparation.

3. If a portion of a field is damaged by flood, drought, weeds, etc., and the grain is difficult to harvest or is of poor quality, consider leaving some of this crop for wildlife. Always check with your crop insurance provider to determine the feasibility of leaving unharvested crops. Additionally, these crops may serve to attract waterfowl. Check with your county wildlife officer or local county Extension agent for rules and regulations for hunting waterfowl over agricultural fields. (See *FSA9082, Hunting Waterfowl and Doves on Agriculture Lands in Arkansas*.)

Field Border and Edge Management

Waterbirds and other wildlife can be found in areas surrounding fields. Field edges are critical habitat for many species. Some simple management can be used to enhance these environments.

1. Avoid or delay burning and mowing field borders, ditches and other habitat surrounding fields if possible. Unmowed borders and ditches provide nesting habitat and escape cover for rails and other birds that are flushed by the combine. If the borders need to be mowed, attempt to delay mowing until after nesting in late July. Note that delayed mowing could contradict your IPM plan for stink bugs, which is to keep the borders mowed during the cropping season, particularly for rice. Waiting until August to mow could cause stink bugs to move from the weeds in the border to the rice at the stage of growth that rice is most susceptible. However, if stink bugs are not a consideration, consider this option.

2. Manage herbicide drift around field borders. Avoid spraying these borders with herbicides when making applications to fields.

3. Areas of waste grain can be left near borders. Field borders can be enhanced with food plots. The Acres for Wildlife program, a partnership program between the Arkansas Game and Fish Commission and the University of Arkansas Cooperative Extension Service, encourages preservation and improvement of existing wildlife habitat or the creation of new wildlife habitat by encouraging land managers to set aside at least one acre for the benefit of wildlife. Eligible participants have the option of receiving wildlife seed packets which plant 1/4 acre. See your county Extension agent for application forms.

4. Identify and manage wetlands, marshes and moist soil units to encourage waterbird use. If the area is consistently unproductive, consider enrolling in a farm bill conservation program.

Conservation Buffers

A conservation buffer is a type of field edge where small areas or strips of land are left in permanent vegetation. Buffers are designed to intercept pollutants and manage other environmental concerns. Strategically placed buffer strips can effectively mitigate the movement of sediment, nutrients and pesticides within farm fields. These same buffers provide food and cover for waterbirds and wildlife. Types of buffers are riparian buffers, filter strips, grassed waterways, shelterbelts, windbreaks, contour grass strips, shallow water areas for wildlife, field borders, alley cropping and vegetative barriers.

A general, multi-purpose streamside buffer design consists of a 50-foot-wide strip of grass, shrubs and trees between the normal bank-full water level and cropland. Trees spaced 6 to 10 feet apart occupy the first 20 feet nearest the stream, shrubs spaced 3 to 6 feet apart dominate the next 10 feet, and grass extends 20 feet further out to the edge of the crop field. Planting trees and shrubs in well-spaced rows makes maintenance activities, such as mowing, easier to do. This design requires 6 acres per mile of stream bank, or 12 acres if installed on both sides of the stream.

FIGURE 4. A streambank stabilization project at various stages of plant growth with cost-share funding through the Wildlife Habitat Incentives Program (WHIP).

Investigate the potential of establishing buffers around fields using one of the many programs from the Natural Resources Conservation Service (NRCS), Farm Service Agency (FSA) or other conservation group. There are many programs that pay producers to establish field buffers, filter strips or restore and enhance wetlands and streamside areas. These programs provide financial incentives and technical assistance for establishing properly managed wildlife habitat.

Crop-Specific Best Management Practices

Corn

Corn is an important crop for waterbirds. The energy found in corn is helpful for migrating waterbirds as well as overwintering birds. Farmland can also be a good source of invertebrates that birds eat, such as earthworms, larval insects and flying insects.

✓ Avoid nutrient management practices that harm earthworm populations. In some cases, applications of soil insecticides and anhydrous ammonia can harm earthworms.

✓ Use a reduced-tillage or no-till system.

✓ Use an insect and weed management program that meets the needs for production purposes, but allows some insect and weed survival for waterbirds.

✓ Maintain shallow water areas and wetlands, and use filter and buffer strips when feasible. If your farm has temporary wet areas, consider enrolling these in a farm bill conservation program.

Soybeans

Soybeans are an important protein source for waterbirds and wildlife. Leave waste grain following harvest. Low areas and seasonal wetlands in soybean fields can also provide valuable resting and nesting habitats for waterbirds.

✓ Use a reduced-tillage or no-till system to improve water quality and leave more waste grain for migrating and nesting birds. Long-term no-till systems will improve invertebrates and overall soil health.

✓ When managing soybean insects, such as the soybean aphid, treat only when thresholds have been reached and, if possible, use a mild form of insecticide such as pyrethroid. Avoid drift into field borders and edge habitats where waterbirds can thrive.

✓ If you are using a rice rotation or want to improve waterfowl habitat, flood soybean fields in the fall using variable water depths. Dabbling ducks and other waterbirds can be supported by just 6 inches of water.

✓ Maintain shallow water areas and wetlands, and use filter and buffer strips when feasible. If your farm has temporary wet areas, consider enrolling these in a farm bill conservation program.

Wheat

Wheat can be an important resource for waterbirds. Waste wheat seed is a good food source for nesting and resting waterbirds. Winter wheat seedlings are eaten during migration.

✓ Straw left in wet areas can improve invertebrate populations. Many waterbirds can benefit from a straw height of 12 to 19 inches.

✓ Reduced and no-till systems will leave more waste grain, improve water quality and provide habitat. These systems will help invertebrates thrive by providing a food source for waterbirds.

✓ Use sound nitrogen management to avoid issues with water quality. Split nitrogen applications may have economic and agronomic benefits, especially on soil types with high leaching characteristics. Good soil equals good wildlife habitat.

Too many waterbirds, particularly snow geese, can negatively affect wheat production. If this is a problem, hunting can be an effective deterrent when in season. Propane cannons and flagging are options for protecting winter wheat from goose damage. For more information, contact your local county Extension office, a regional office of the Arkansas Game and Fish Commission (800-364-4263) or USDA Wildlife Services (870-673-1211).

Cotton

Cotton does not provide a meaningful food source for waterbirds. However, it is an important component of the landscape where many waterbirds overwinter. The best management practices for cotton reflect good stewardship of crop management.

✓ No-till and reduced-till systems have a positive effect on water quality. These systems will affect soil health and can increase invertebrate habitat.

✓ Nutrient management should follow a plan that takes into consideration water quality and wildlife.

✓ Agrichemicals should be managed according to your IPM plan. Since insects are a potential food source for waterbirds, practices for insect control should be based on insect thresholds. When selecting an insecticide, choose one with minimal environmental effects.

Rice

Properly managed rice has the greatest potential for producing quality habitat for waterbirds. Rice production benefits waterbirds by providing feeding, resting and nesting habitat throughout the year. Waterbirds can benefit rice production by eating weed seeds and insect pests and speeding straw decomposition. Rice production practices are compatible with attracting waterfowl, which provides a recreational resource and possibly income from duck hunters. Waterbirds and rice plants have one thing in common – both require good water management.

✓ Winter flooding conserves soil and soil nutrients, increases the quality of runoff water, retards winter weed growth and contributes to rice straw decomposition, thus providing economic and environmental benefits.

✓ Irrigate using surface water by installing a tailwater recovery system and by pooling rainwater. Surface water is cheaper to pump than groundwater.

✓ Gradual, staggered flooding of rice fields will provide new feeding opportunities throughout the winter period and a range of water depths for waterbirds. Areas of exposed moist soil are beneficial for birds, too.

✓ Drawdown of fields that were flooded during the winter should be delayed to late February to provide habitat for late-wintering waterfowl, early-migrating shorebirds and early-migrating wading birds. Drawdowns should be gradual or partial to continually expose new habitat throughout migration.

✓ If feasible, plant later-maturing rice varieties to allow more time for rice-nesting birds to finish nesting before harvest. A later harvest also means more waste grain is available later in the winter for waterfowl.

✓ For helping waterbirds, a conventional harvester is recommended over a stripper-header because

TABLE 1. Calendar for applying best management practices for rice and bird activity.
Note that flooding rice fields can benefit waterbirds at any time of year.

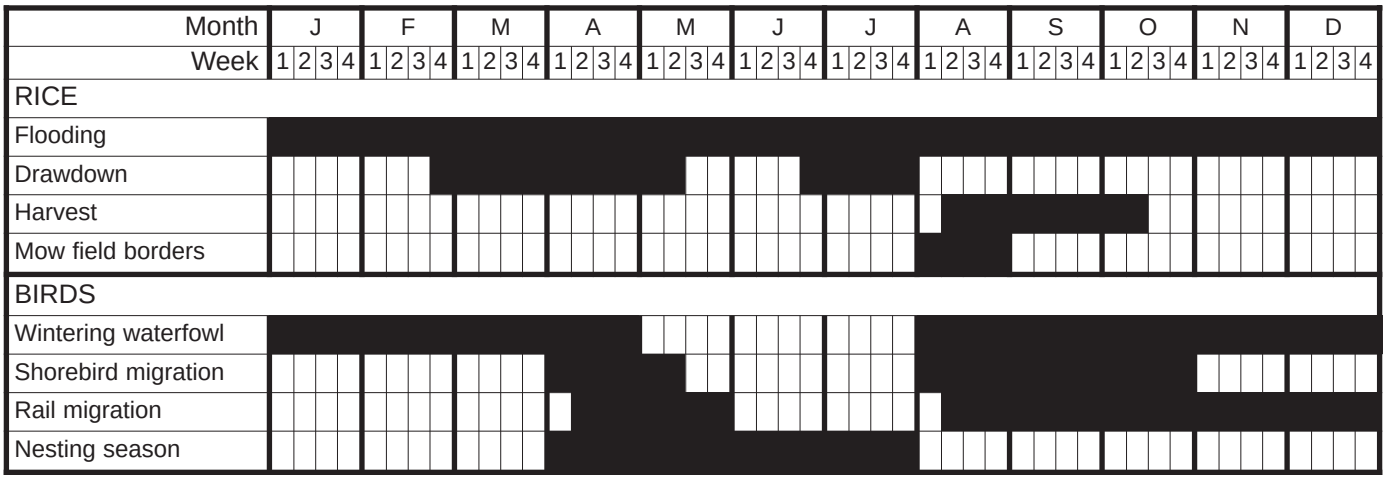

FIGURE 5. Irrigation ditches provide habitat for waterbirds.

the former leaves more waste grain (plus it can be used to harvest soybeans as well).

✓ Roll or burn straw after harvest.

✓ Use nutrient management practices as specified in a nutrient management plan.

✓ Use a tillage system that leaves crop residue and waste grain such as conservation till or no-till.

✓ Use an IPM plan. Minimize pesticide drift into adjacent habitats.

✓ Manage impoundments and drainage ditches as permanently flooded habitat with native emergent vegetation.

✓ Allow field borders and ditches to grow to provide cover and food for waterbirds. If you must mow, ideally delay mowing until late July or early August. Do not burn or mow after May 1.

✓ Enhance buffer strips and riparian areas for wildlife using farm bill conservation programs.

Getting Started

As with any new practice, there will be a considerable learning curve on how to implement best management practices for your farm and its associated wildlife habitat. Here are a few simple suggestions for implementing these practices:

1. Set clear goals and objectives. Determine what you would like to accomplish and why.

2. Be patient. Do not try to change too many things at once. Try a few things and evaluate their effectiveness. Establishing wildlife habitat often takes longer than establishing a crop. For example, native warm-season grasses take several years before they are properly established.

3. Get help. There are many sources of information and assistance. Contact your local county Extension agent about the Master Farmer stewardship program or 4-H Managing Rice for Ducks. Private land biologists with the Arkansas Game and Fish Commission can provide assistance with designing wildlife plans for your farm. Contact either to learn about farmers or landowners in your area who have successfully improved waterbird and wildlife habitat.

FIGURE 6. Geese are attracted to water and open areas.

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