ARE YOU RAISING HORSES and wondering why you are having to buy more feed each year as your land’s productivity declines, leaving bare ground and weeds?

HAVE YOU HAD THE GOOD FORTUNE to buy a place with a riparian area and are now frustrated that you aren’t permitted to remove the brush so you can see the water?

DID YOU JUST FIND OUT that those pretty purple flowers along your fence are noxious weeds and threaten the productivity of your land and your neighbor’s land?

As you can see, there’s a lot to know about owning and managing land, and you need to know even more if you’re raising livestock, too. This booklet will get you started and give you lots of information and ideas for your place. With a little time, a little knowledge and not a whole lot of money, you can have a “picture perfect” place that you can be proud of...and protect Arizona’s land and water. Remember, we’re all part of a neighborhood and our actions can affect others. Refer to the last page for information on how to avoid contamination and infringement on others’ rights. The things that you and your neighbors do can greatly improve the health of our resources...the resources we all appreciate about Arizona.

> Look At What You Have

Any landowner needs a management plan. Before developing your plan - look around, make a sketch, and take a few notes about your property. In your sketch, show or note:

- Property boundaries
  - Fences and corrals
  - Buildings
  - Wells (human or stock)
  - Septic system
  - Streams, wetlands, ponds
  - Bare ground
  - Weeds
  - Lawn, pasture, or crop land
  - Trees or shrubs
  - Soil type (request your county’s soil survey from USDA Natural Resources Conservation Service)
  - Depth to groundwater

(check with well driller)

- Neighboring land uses
- Flat or sloped ground

The four pastures in this “After” drawing allow better management of livestock grazing and increased forage production. A stockwater tank located in the corral is accessible from all pastures and reduces streambank trampling. Shrub and tree plantings along the streambank prevent erosion, replace weeds and bare areas, and provide wildlife habitat.

> Con$ervation Value$

- Saves money because your land is more productive over the long term
- Ensures better water quality for you, your animals, and your neighbors
- Provides wildlife habitat
- Produces more grass for grazing
- Grows healthier livestock
- Improves your property values
- Makes your place more attractive
- Keeps your neighbors happier
- Satisfies your responsibility to care for the land

> What Are Your Property Goals?

What do you want?
What can your land support?

Livestock grazing? How many? Healthy forest? 
Wildlife habitat? Native plants?
Good water quality? A 4-H project?
Fish? Something else?

You may find that you have to modify some of your goals because they are not realistic for your property.

> Make A Plan For Your Land

Once you’ve looked at your property and identified your goals, you need to develop a management plan for reaching your goals. Remember, even if you like things just the way they are, you will need to do something to keep weeds from coming in or to keep the water clean! This booklet provides useful information on developing the many different parts of your management plan.

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Pasture and Irrigation Management ......................................... 3
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Grazing Management and Fencing Options .............................. 5
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Forest Management .............................................................. 8
Know Your Responsibilities and Homsite Selection ..................... 9

Look At Your Land...Make A Plan
Give Your Land A Health Exam
How much of these do you have on your property?

Healthy ground cover (forest, shrubs, grass, or cropland)
Weeds or plants that hold the soil poorly (mustardweed, tumbleweed, thistle)
Bare ground

If all of your answers are in the first column, your land earns an "A" for health. If most of your answers are in the second column, it is in average condition. If you have any responses in the third column, your land needs immediate help! Read on to learn about conservation practices that will improve your land's health.

Weed Control
Weeds spread fast, so regularly look for new weed patches on your property. Act immediately to treat them by using one or more of the weed control practices listed below. Team up with neighbors to improve effectiveness. Remember, weed control by itself is not enough. It is also necessary to modify the practices that caused weeds to become established in the first place!

Prevention. Good land management will help keep desirable vegetation healthy and weeds under control. Buy only weed-free hay, plant only certified seed, wash your vehicle after being in a weed-infested area, monitor your property, and respond quickly to any new weed infestations.

Biological. Biological control attempts to find something in nature that can weaken or eventually kill a weed plant. Successful bioagents include certain fungi and insects that weaken weeds by attacking seed heads and other plant parts.

Mechanical. Mow weeds annually before they go to seed. Pull small weed patches and weeds near streams by hand.

Livestock Grazing. Graze weeds before they go to seed using sheep, goats, or cattle. Because livestock and wildlife can easily carry and spread weed seed on their coats or in their feces, avoid moving livestock from a weedy area to a weed-free area. Some weed species, if eaten, will make livestock sick.

Chemical Herbicides. Herbicides may be expensive, but are effective when applied in the proper amounts and at the proper time of year. Read the label instructions carefully and follow directions. Use chemicals away from water to prevent adverse health effects to you and your animals and to prevent pollution of streams and groundwater. Only licensed users can use restricted herbicides. Call a local farm supply store to find out about hiring custom chemical applicators to spray your weeds. Be sure herbicide will not reach and kill desirable trees and shrubs. Properly dispose of leftover chemicals.

Soil - Know Your Soil
Soils vary widely, even across your backyard. The type of soil you have will influence:

- What type and how much grass or crops your land can produce
- How quickly water moves through the soil
- If the soil will filter human and animal wastes before they reach groundwater
- How often you need to irrigate
- How much fertilizer is needed
- Possible problems with building foundations
- If the area is a wetland

For information about your soil type, refer to your county's soil survey available from the Natural Resources Conservation Service (NRCS) office in your phone book under United States Government, Dept. of Agriculture.

Know Your Weeds Before They
- Choke out desirable forage for livestock and wildlife
- Reduce the productivity of your pasture and land
- Cause water pollution and soil erosion because they’re less effective at holding the soil
- Spread RAPIDLY!

Is Your Soil Covered?
...not by insurance, but by vegetation! Vegetation protects the soil from erosion by rainfall, wind, and flood. Vegetation increases water uptake by soils and holds soil in place on slopes and along streams.

How Fertile Is Your Soil?
You'll need a soil test to find resources. Contact your local Natural Resources Conservation Service or take a soil sample and send it for testing.

Types - Know Your Soil
- Knobweed (Spotted, Russian, and Diffuse)
- Prickly Poppy
- Whitetop
- Dalmation Toadflax
- Thistles
- Starthistles
- Jointed Goatgrass

For Help
Contact your local Arizona Department of Agriculture or county cooperative extension office to obtain a list of noxious weeds in your area and recommendations on how best to control them.

Weed Management and Soils
Is Your Irrigated Pasture and Hay Production?

<table>
<thead>
<tr>
<th>FERTILE SOILS</th>
<th>POOR SOILS</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEED (Hay) TONS/acre</td>
<td>FORAGE AMPS/acre</td>
</tr>
<tr>
<td>Intensive management</td>
<td>5-7</td>
</tr>
<tr>
<td>Non-intensive management</td>
<td>3-5</td>
</tr>
</tbody>
</table>

These figures are averages and may vary up or down, depending on management.

To Increase Your Pasture Production

A pasture is a grazing area for animals enclosed by a fence. Pastures are often planted to nonnative plant species to increase their production. These pastures may need fertilizing, irrigating, and periodic replanting.

- Develop irrigation (if you have a water right, see page 9). Practice irrigation water management. Under-irrigating will shorten the life of your pasture; over-irrigating wastes energy, water, and your time.
- Fertilize according to NRCS and CES, and soil test recommendations. Believe the soil test! Overfertilizing is not better and can damage water quality.
- Move pastures to a uniform 3-inch height after grazing to stimulate equal growth of all plants.
- Drag or harrow to spread nutrient-rich manure.
- Control weeds.
- Reseed. Contact your local NRCS and CES office to determine the most productive seed mixture for your purpose and location.
- Use Pasture Management Rotation.

Consider Custom Farming As A Way To Improve Your Pasture

Many landowners find it too expensive to own their own farm equipment for preparing the soil, seeding, harvesting, or baling. Ask your neighbors if they know of any custom farmers or ranchers in the area who will follow your instructions for improving your pasture.

Irrigation Systems

Advantages and Disadvantages

Flood irrigation includes the level border system with an efficiency of 80-90%, the graded border system with an efficiency of 60-70%, and the graded furrow or corrugation system that is the least efficient at 30-50%. The graded furrow requires a lot of maintenance to maintain furrows. If a tailwater recovery system is installed on graded systems, the efficiencies can be increased by 25%. Disadvantages include the high cost of leveling fields and creating borders on a small acreage.

Sprinkler irrigation (includes moveable handlines, sidehill, solid set and center pivot) has an efficiency that ranges from 60-75% and can require a high initial investment. These do not work well on heavy clay soils.

Irrigation Management Depends on Soil Texture

- How does it feel in your hand?
- Silt feels silky when wet
- Sand feels coarse and gritty
- Clay feels sticky when wet
- Loam is a combination of all of these.

Irrigation How Much and How Often?

<table>
<thead>
<tr>
<th>Texture</th>
<th>Moisture to be replaced in the 3-foot root zone when soil is at 50% of its water-holding capacity</th>
<th>Average Peak Season Irrigation Frequency (May-August)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loamy sand</td>
<td>1.4&quot;</td>
<td>5 days</td>
</tr>
<tr>
<td>Sandy loam</td>
<td>2.3&quot;</td>
<td>8 days</td>
</tr>
<tr>
<td>Loam</td>
<td>3.1&quot;</td>
<td>10 days</td>
</tr>
<tr>
<td>Clay loam</td>
<td>3.2&quot;</td>
<td>11 days</td>
</tr>
<tr>
<td>Clay</td>
<td>3.1&quot;</td>
<td>10 days</td>
</tr>
</tbody>
</table>

* These moisture replacement estimates are for alfalfa/grass hay crop. Amounts may vary for other crops. Irrigation is most important for alfalfa during the seedling stage and immediately after cutting. If your soil depth is less than 3', you'll need to irrigate more often and apply less water.

Q: When do I need to irrigate?

A: Irrigate when the soil moisture drops to about 50 percent of its water-holding capacity in the top 3 feet of soil. Check your soil moisture by squeezing several handfuls of soil taken at 6", 12", and 18" depths in your field. Irrigate before the soil at the 18" depth begins to crumble in your hand, since most of the plants' roots are above 18".

Q: How long should I irrigate?

A: In general, irrigate sandy soils for short periods (2-3 hours) and clay soils for longer periods (9-12 hours). Ask your farm supply store or local NRCS office to recommend the correct size spray nozzle for your soil type and your irrigation system. When it rains, see if the rain has gone deeper than the soil surface before considering it a source of water for your crop. To determine exactly how long to run your system, first place several pans at various locations under your sprinkler system. Run the system for one hour. Average the depth of the water in the pans. This is your hourly application rate. Next, divide the inches of water to replace by the hourly application rate.

Example: Loam needs 3.1" of water replaced in the top 3 feet when it is at 50 percent of its water-holding capacity (see irrigation table). If your irrigation system's application rate is 0.3"/hour, you will need to run your irrigation system for ten and a half hours to deliver 3.1" to the soil, since 3.1" ÷ 0.3"/hour = 10.5 hours.

For Help The USDA Natural Resources Conservation Service, an irrigation company, or a consultant can provide assistance in designing an appropriate irrigation system for your property.
Are Your Grazing Animals Properly Managed?

Do you have so little grass in your pastures that your animals consume dirt while trying to graze?
Are your animals browsing on trees, shrubs, fences, or barns?
Are your animals losing weight, or are they overweight?
Do your animals have scuffy coats?
Are your animals prone to colic or respiratory problems?

If you answered "yes" to any of these questions, you need a new grazing program that will provide more grass and healthier animals... and save you money in lower feed costs and lower veterinarian expenses!

Grazing Management Produces More Grass

Continuous grazing allows weeds to grow where grass roots have been weakened. A less dense leaf canopy allows sunlight to reach invading weeds.
Pasture rotation and good grazing management produces more grass, fewer weeds, and a minimum of bare ground.

Do You Have Enough Feed and Forage For Your Livestock?

In most of Arizona, livestock are usually grazed yearlong. This includes the time during the plants growing season (if you have enough pasture).

Forage is what your animals consume by grazing. Forage production is measured in animal unit months (AUMs). One AUM is equivalent to the amount of forage consumed by a 1,000-pound animal in one month.

Feed is the hay that you provide an animal when forage is not available. Hay production is measured in tons per acre.

Q. How much feed and forage do your animals need yearly?
A. Average requirements are listed below, but may vary with season, level of use, and the age and size of the animal.

<table>
<thead>
<tr>
<th>Feed (hay)</th>
<th>Forage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tons/month</td>
<td>AUMs of grazing/month</td>
</tr>
<tr>
<td>1 cow</td>
<td>.4</td>
</tr>
<tr>
<td>1 horse</td>
<td>.5</td>
</tr>
<tr>
<td>1 sheep</td>
<td>.1</td>
</tr>
<tr>
<td>1 llama</td>
<td>.15</td>
</tr>
<tr>
<td>1 goat</td>
<td>.1</td>
</tr>
</tbody>
</table>

Q. How much feed and forage can your land produce?
A. See Pasture and Hay Production table on page 3.

Q. Does your forage requirement balance with your land?
A. To find out, do your own calculations following these examples:

**FORAGE REQUIREMENT:** 2 horses x 1.25 AUMs x 12 months = 30 AUMs/month

**FORAGE PRODUCTION:** 40 acres (fertile nonirrigated soil) x 2 AUMs = 80 AUMs

In this example you do not have enough forage (grazing) to meet your animals’ needs. To avoid overgrazing your pastures each year:

- Buy additional feed or rent pasture
- Increase your pasture production (see “tips,” previous page)
- Improve your grazing management
- Reduce your number of animals
- Seek assistance

How Grazing Affects Root Growth

<table>
<thead>
<tr>
<th>Percent Grass Plant Removed</th>
<th>Percent Root Growth Stopped</th>
</tr>
</thead>
<tbody>
<tr>
<td>10%</td>
<td>0%</td>
</tr>
<tr>
<td>20%</td>
<td>0%</td>
</tr>
<tr>
<td>30%</td>
<td>0%</td>
</tr>
<tr>
<td>40%</td>
<td>0%</td>
</tr>
<tr>
<td>50%</td>
<td>2-4%</td>
</tr>
<tr>
<td>60%</td>
<td>50%</td>
</tr>
<tr>
<td>70%</td>
<td>78%</td>
</tr>
<tr>
<td>80%</td>
<td>100%</td>
</tr>
<tr>
<td>90%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Notice how the root mass of these grasses decreases in pastures that range from excellent to good to poor condition.

Poor Condition Pastures Cause

- colic and respiratory problems from eating dirt
- weight loss
- parasites
- poor coat

Grazing Management and Livestock Health
Grazing Schedule
For A One Herd
Multiple-Pasture System

In Arizona, livestock usually graze yearlong. Try to avoid grazing pastures during the growing season. If not possible, rest one pasture during the end of the growing season each year to enable plants to set seed. A minimum of 30 days is needed between grazing periods on irrigated pasture and up to 3 months for nonirrigated pasture. You may need to corral livestock and feed them hay until the pasture regrows.

Sample Designs
For A Multiple-Pasture Grazing System

- Shelter in corral
- Water in corral
- Gate
- Corral
- Pasture
- Pasture fence

Stockwater Development
An Essential Part of Your Grazing and Animal Health Programs

As you divide your acreage into several pastures, establish separate water sources for each pasture or a single water source that is accessible from several pastures. Clean, fresh water is essential for good animal health. Options for stockwater development include:

1. A stock tank or pond (check on status of water rights).
2. Water gaps on a stream. For small acreages, it is highly recommended that you fence your grazing livestock away from streams to keep manure out of the stream, protect and maintain streamside grasses and shrubs, and control erosion (see Water Quality Protection on page 9).

For Help

Obtain publications from county extension offices on livestock production, farming, gardening, and 4-H programs. Assistance is available from the USDA Natural Resources Conservation Service, conservation districts, and private consultants to:

- Design a grazing system, stockwater developments, and a livestock waste disposal program
- Increase hay and pasture production
- Help you meet water quality standards

Types of Fencing

<table>
<thead>
<tr>
<th>ADVANTAGES</th>
<th>DISADVANTAGES</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-STRAND BARBED WIRE</td>
<td>Barbed wire may be injurious to horses and llamas. Labor and material costs high. Periodic maintenance required. May be damaged by big game.</td>
</tr>
<tr>
<td>WOVEN WIRE</td>
<td>Labor and material costs high. Some maintenance necessary.</td>
</tr>
<tr>
<td>4- to 10-STRAND SMOOTH WIRE</td>
<td>Labor and material costs high. Periodic maintenance required.</td>
</tr>
<tr>
<td>ELECTRIC</td>
<td>Weather damage. Don’t use in areas where snow, ice, or wet areas. Requires regular maintenance. Needs solar or electric power source.</td>
</tr>
<tr>
<td>JACKLEG</td>
<td>High labor and material costs during construction.</td>
</tr>
<tr>
<td>POST AND POLE (RAIL FENCE)</td>
<td>High labor and material costs.</td>
</tr>
<tr>
<td>HOG PANELS</td>
<td>Inexpensive and easy to construct. Appropriate for only a few sheep or other small animals. Should be moved once or twice each day.</td>
</tr>
</tbody>
</table>

Grazing Management and Fencing Options
How Safe Is Your Drinking Water?

Do you have a drainfield or livestock corral less than 100 feet from your drinking well or stream?

No □ Yes □

Are your streambanks bare of vegetation, eroding, or falling into the stream?

No □ Yes □

Do your well tests show fecal or nitrate contamination?

No □ Yes □

If you answered “yes” to any of these questions, you will want to take immediate action to correct the problem. Get help!

Uncertain About the Safety of Your Drinking Water?

The Farm “A” Syst program allows you to assess the potential effects of various farmstead practices on your drinking water supplies. In addition to ten do-it-yourself worksheets, the program provides suggestions for how you can modify your practices and where to go for help. The quality of your drinking water can affect land values since lenders consider the cost of corrective actions or cleanup in sale prices. Contact your county extension agent for more information.

Tips To Prevent Water Pollution

• Establish and maintain shrubs and grasses along streams and around animal confinement areas to trap and absorb pollution-laden runoff before it reaches streams or groundwater.

• Locate corrals and other livestock confinement areas away from streams. Use water gaps or off-stream stockwater tanks to minimize livestock trampling of streambanks.

• Avoid over-irrigation that can cause valuable topsoil, fertilizer, and pesticide runoff.

• Properly dispose of manure, feed, and bedding wastes by spreading on your cropfield. Be sure soil is not too wet or frozen to absorb wastes. This will reduce your need for expensive commercial fertilizers.

• Locate septic system downslope of your drinking water well.

• Use farming practices that reduce soil erosion and increase water infiltration, such as: minimum tillage, contour farming, filter strips, and grassed waterways.

• Do not mix, apply, or dispose of weed control chemicals, used motor oil, or other toxic substances near streams or where they can leak into groundwater. Contact your county health department for the best method of disposal in your area.

Riparian Areas

Are found along streams, lakes, and wetlands. They are comprised of water-loving plants such as alder, willow, cottonwood, and sedges.

Continuous season-long grazing often removes important riparian vegetation and may cause streambank erosion and water quality degradation.

These areas make up a small portion of our landscape, yet 60 to 75% of Arizona’s resident wildlife species are dependent on riparian habitats. They contain a large percent of our plant and animal diversity. Just about everything you like about these riparian areas depends on good management to keep them in their natural state.

A Healthy Riparian Area

is the key to a healthy stream system. Lush riparian and wetland vegetation along the water’s edge will:

• Slow flood flows and reduce erosion and property loss
• Secure food and cover for fish, birds, and other wildlife
• Keep water cooler in the summer and prevent ice damage in winter
• Reduce water pollution by filtering out sediment, chemicals, and nutrients from runoff
• Provide important breeding habitat for birds
• Shelter animals during calving, lambing, or fawning
• Hold more water in the soil, slowly releasing it for longer season streamflows and groundwater recharge

For Help

• The U. S. Fish and Wildlife Service’s “Partners for Wildlife Program” funds projects that create, enhance, or restore wetlands and riparian areas (602-640-2720).

• The Arizona Riparian Council has information on riparian area conservation and management (602-965-2490).

• County extension offices have lots of water publications, including information on how to test your drinking water quality.

• The Arizona Department of Environmental Quality will answer questions about state and federal water quality laws (602-207-2300 or 1-800-234-5677).
Is Your Property Attractive to Wildlife?

Is there a variety of vegetation, such as wildflowers, tall grasses, shrubs, and trees for food? For cover?

Is water accessible to wildlife all year?

Can wildlife avoid predation from domestic animals, such as cats and dogs?

The more "yes" responses you had, the more likely you will enjoy the company of birds, small mammals, and possibly deer and elk.

How you choose to use your land will largely determine the kinds and amounts of wildlife it will support. No matter its size or condition, your property will produce wildlife, but certain land use practices can prevent it from attaining its full wildlife potential.

Fortunately, many of these practices can be easily modified to be more "wildlife friendly" without a significant investment of time and money. Following are a few ways you can accommodate wildlife on your ranch or farm:

Modify Your Land Use Practices

Fences. Fences can inhibit wildlife movements and cause physical injury or death through entanglement. Net or woven wire fences should be avoided if possible because they are the most difficult for wildlife to cross. A 4-strand barbed wire fence should have 12 inches between the top two strands, and the bottom strand should be smooth and at least 16 to 22 inches above ground. Three equally-spaced wire strands will keep the fence rigid, thereby preventing animals from entangling their legs when jumping over.

Water Development. Livestock troughs should be constructed and maintained with wildlife use in mind. Water developments should provide a dependable source of water all year, even when livestock are not in the area. When trough height is 20 inches or less, javelina and young deer will have access to the water. To reduce the hazard of wildlife drowning, troughs should contain a ramp or escape ladder and water storage tanks should be covered or equipped with a floating board.

Brush Removal. Many species of wildlife require areas of dense vegetation for nesting and escape cover. Shrubs are important browse for deer. Brush removal that selectively leaves areas of browse and cover will be more beneficial for deer than extensive brush removal projects. If cover is in short supply, brush piles that result from other land treatment methods can increase nesting and protection cover.

Livestock Grazing. Year-round grazing tends to reduce wildlife habitat quality. (See grazing Systems on Page 5.) Grazing can be timed to favor production of early-season forbs preferred by deer, or to increase grass cover important to ground-nesters.

Agriculture. When harvesting crops, begin cutting from the center of the field outward to flush birds away. Avoid mowing, burning, or using weed control chemicals until birds are out of the nest in mid-June. Areas untreated by pesticides will produce more insects which are essential for the growth of quail chicks.

Snag Removal. Dead or dying standing trees (snags) that pose no safety hazard should be left on site for wildlife. Over 85 species of North American birds use cavities in snags, and bats and squirrels depend on snags for roosting and breeding sites. Many of these species consume large quantities of insects which, if left unchecked, can become major agricultural pests.

Wildlife Habitat = Food + Water + Cover

Wildlife habitat is being lost as more land is subdivided, bringing houses, people, livestock, dogs, cats, and other intrusions. Landowners can help offset this loss of wildlife habitat by growing a diversity of vegetation that provides food and cover for wildlife.

Food requirements will naturally vary by wildlife species, from the seeds and berries required by birds, to the grasses, forbs, and shrubs preferred by deer and elk.

Water can be a key factor in wildlife habitat. In some cases, a pond, stream, or developed stockwater can increase the diversity of wildlife you can attract.

Cover is needed for hiding from predators, travel corridors, nesting, and shelter.

Riparian Areas

Riparian areas support the greatest variety and abundance of wildlife in Arizona. Because riparian areas are also favored by livestock, they require special management. While livestock should be fenced out of some riparian areas, others can be lightly grazed during the non-growing season with little damage to wildlife habitat. Livestock should be excluded from degraded riparian areas until vegetation is fully recovered. Cottonwoods, forbs, and salt blocks should be placed well away from riparian areas to prevent trampling of banks and overgrazing.

Enhancing Your Property For Wildlife

After making your property "wildlife friendly", you may want to enhance habitat or create additional habitat for wildlife. If so, you will need to identify the requirements of the target species and any factors limiting its occurrence on your property. Techniques that duplicate natural forces, such as fires that create openings, offer the cheapest and most effective means of providing wildlife with habitats they have adapted to through time.

Where good cover is present, reduce competition with less desirable plants or protect from overuse by livestock. Mechanical crushing and controlled burning can be used to create openings and invigorate "overmature" browse. However, habitat manipulations to encourage some species will discourage others.

Hedgerows provide escape, refuge and nesting cover, as well as travel lanes for wildlife. Low, woody vegetation can be planted along fencelines as part of a windbreak, in guilds to control erosion, and around ponds, springs, and food patches. Native species should have priority in any planting program. Hedgerows should be at least 15 to 20 feet wide to be effective.

 Arborist tree species are planted in rings to provide shelter for wildlife. Trees are selected to provide a variety of fruit and seeds for wildlife to eat.

For Help

To develop a plan for improving wildlife habitat on your property, contact your local USDA Natural Resources Conservation Service, Arizona Game & Fish Department office, or visit your library or local bookstores.

For information about ordering trees and shrubs that wildlife prefer, contact the Arizona State Land Department or ask your local nursery to suggest some native shrub and tree species adapted for your area.

Information on pond development is available from the USDA Natural Resources Conservation Service at the Arizona Game and Fish Department.
Is Your Forest Healthy?

Are your trees free of problem insects, diseases, or animal damage?
Are your trees spaced far enough apart to allow some sunlight to reach the plants growing on the ground?
Is there more than one age or size of tree present (e.g., seedling, pole, mature)?
Is there more than one tree species present?
Is there scattered, rather than piles of, down woody material?
If you had all “yes” answers, your woodlot is looking good. If not, read on...

Forest Insects and Disease

Chemical control of insects is generally not economically feasible. Be sure to maintain good forest health. See your local forester for helpful suggestions.

**Vulnerable Trees**

**Problem**

- German fife, spruce, subalpine fife, species of pine > 6” diameter.
- Pitch tubes or moistness of sap on bark, surface or mounds of red-orange browning dust on bark, and girdling of cambium layer
- Ponderosa white pine, true fives
- Gall rust forms large swellings on branches and twigs. Blister rust cracks bark open in spring, exposing yellow or orange powdery spores
- Species of true fife, spruce, Douglas fir and larch
- Initially, silky webbing in needles, followed by clustered needles turning brown at tips of branches
- Douglas fir, ponderosa, pinyon and white pine, and Engelmann and blue spruce
- Witches-broom forms on infected branches, leading to stunted and deformed growth
- Conifers. Douglas fir, grand fife and subalpine fife are most susceptible
- Individual or small pockets of trees are dying in the stand, tree crowns thinning
- All sizes, ages, and species of trees
- Outer bark removed, exposing inner layers grooved with parallel teeth marks, and gnawed leaders causing forked tops

**For Help**

- The Arizona State Land Department’s Forestry Section provides technical assistance to private landowners through several programs. The Stewardship Incentive program gives financial assistance on a cost-share basis for land treatments. The Forest Health Program targets insects and diseases. Although they do not sell tree seedlings, the Arizona State Land Department does provide technical assistance on what types of trees to plant and how to manage them (602-542-2515).
- The USDA Natural Resources Conservation Service and local conservation districts can provide assistance in developing a forest land grazing plan.
- Private forestry consultants can conduct forest inventories, set up timber sales, and help you achieve your forest management goals. A directory of consultants is available from the Arizona State Land Department.
About to Build?
Is the site in a floodplain or close to a stream?

Could your access road cause slumping, scar the hillside, or cause sediment to enter a stream?

Will your prospective homesite disturb wildlife habitat?

Does your neighborhood lack covenants that will protect the land, water resources, and future aesthetics of the area?

If you answered “yes” to all of the questions, WHOA—you have some planning to do.

Tips For Planning A Homesite

- Plan for minimum impact before building: locate homes and roads away from streams, on stable soils, and avoid steep slopes.
- Avoid disturbing wildlife corridors, wetlands, and riparian areas.
- Control your pets so they don’t disturb or attract wildlife.
- Maintain or plant native vegetation or other suitable species.

As a neighborhood working together,
provide the diversity that birds, butterflies, and small and large mammals need for food, cover, and nesting:
(a) plant small corner wood-lots,
(b) establish shelter-belts edged with shrubs along property boundaries,
(c) connect with meadows of native grasses or pasture land,
(d) locate house and lawn in a corner of your property to minimize wildlife disturbance.

What Is a "Conservation Easement"?

Arizona is a great place to live! As more and more people are visiting, buying land, and moving here, the wide open spaces that make Arizona so special are shrinking. You can help keep Arizona a ‘great place’ by considering a conservation easement on your property.

A conservation easement is a legal document between you and the easement holder that specifies what future uses will and will not be allowed on your property. The easement is attached to the deed for your property and remains with the property forever. The easement holder is responsible for ensuring that the terms of the easement are met in the future. Because some future development options are excluded, property taxes may be less.

What You Need To Know As An Arizona Landowner

Water Rights - You must have authorization before diverting, withdrawing, impounding or disturbing any surface water. All wells must be registered. In some areas of the state a grandfathered water right or ground water withdrawal permit is required for pumping wells with a capacity of greater than 35 gallons per minute.

Protection of Streambed and Banks - Permits are necessary prior to any activity modifying the stream channel or streambanks.

Flooding Protection - A local permit may be needed before doing any construction in an area inundated in a 100-year flood. Insurance and financing may be restricted in a floodplain.

Control of Noxious Weeds - Find out which weeds are noxious by state law or local ordinance and how to control them. Some locations in the state have weed control districts.

Septic System Installation - State law regulates septic system installation, including the minimum acceptable distance between your septic system and drinking wells, streams and groundwater. Most counties also approve the septic system design, capacity, and soil type used to treat your wastes.

City/County Zoning - Before building, contact your city or county planning office to obtain zoning requirements and information. Find out if your city or county has special ordinances, such as property access road restrictions, an aquifer protection ordinance, or grazing restriction covenants which may affect your proposed activity.

Water Quality Protection - You are responsible for preventing livestock manure, pesticides, sediment and other pollutants from reaching waterways.

Wetlands Protection - Permits to fill, drain, dredge, or alter any waters of the U.S., including wetlands, are mandatory. Call for any information before you alter any wetland.

Threatened or Endangered Species - You must have a permit to harass, harm, kill, etc. threatened or endangered species. The law encourages you to protect these species and their habitat.

Stocking Fish In Your Pond - You will need a permit to stock any species of fish in a private pond.

Air Quality Protection - State regulations and local ordinances may regulate activities that degrade air quality, and may restrict the use of stoves and fireplaces.

Open Range - Arizona is an open range state. Adjacent landowners are equally responsible to maintain the fences between them. Fence your property to keep range livestock out and your animals in. It is unlawful for pets to harass, kill, or wound livestock and wildlife.

Who To Contact

- Arizona Department of Water Resources, Phoenix 602-417-2442
- Ground water 602-417-2470
- U.S. Army Corps of Engineers, Phoenix 602-540-5385
- County Flood Control District, or Arizona Department of Water Resources 602-417-2445
- Local weed district
- County Cooperative Extension office
- County health department or planning office
- City or county planning office
- Arizona Dept. of Environmental Quality 602-207-2300
- County Cooperative Extension office
- U.S. Army Corps of Engineers, Phoenix 602-649-5385
- Natural Resources Conservation Service
- U.S. Fish & Wildlife Service
- Arizona Game & Fish Dept., Phoenix 602-942-3000
- County health or local fire departments
- Arizona Department of Agriculture, Animal Service Division, Phoenix 800-294-0305

Inquire about other laws that may apply to your property or proposed activities.
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