THE UNIVERSITY of TENNESSEE Extension

FORESTRY, WILDLIFE & FISHERIES UPDATE NEWSLETTER

NOVEMBER 2010

Walnut twig beetle adults on thousand cankers of black walnut

Ned Tisserat, Colorado State University, Bugwood.org

Thousand Cankers Disease (Geosmithia morbid) is a fungal pathogen of black walnut.

The Emerald Ash Borer adult is a bright metallic green beetle which is just under a half inch (10-12 mm) long.

Damaging stage is the Ash Borer larvae that lives under the bark.

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FOREST PEST MANAGEMENT TRAINING – EMPHASIS ON EMERALD ASH BORER AND THOUSAND CANKERS DISEASE

Wayne K. Clatterbuck, Professor, Forest Management and Silviculture

2 Sessions and Locations:
Both sessions begin at 9:00 am local time and adjourn at 4:00 pm

- Tuesday, November 30 at Montgomery Bell State park near Dickson, TN
- Tuesday December 7 at the University of Tennessee Welcome Center in Knoxville (Neyland Drive at Cumberland Avenue)

Continuing Education Credits:

- SAF CEUs --- 6 hours
- Pesticide Points --- 6 points in C2, C10, and C12 categories

Subject Matter:

1. EAB and TCD --- Identification, geographic proximity, biology, pathways, host symptoms, management actions. Speakers/Presenters include Drs. Frank Hale and Alan Windham, UT Entomology and Plant Pathology; Bill Jones, USDA Forest Service, Forest Health Protection, Asheville, NC

2. Forest Pest Updates --- gypsy moth, southern pine beetle, hemlock wooly adelgid, and others. Tennessee Division of Forestry Personnel

3. Keeping Forests Healthy through Silviculture . Wayne Clatterbuck, UT-FWF

Cost: $25.00 including Lunch. No cost for TDF personnel (covered by a grant)

Registration: Contact Wayne Clatterbuck (865-974-7346 or wclatterbuck@utk.edu) at least two days before each workshop so we can make lunch arrangements. TDF personnel do NOT need to register.

NOTE: UT Extension Personnel: This training is different from the forestry in-services being held on Dec. 1 & 2

EXTENSION INSERVICE IN FORESTRY

Wayne K. Clatterbuck, Professor, Forest Management and Silviculture

UT-FWF Extension is presenting forestry inservice trainings for UT-Extension personnel at the following two locations.

- Wednesday, December 1 at Montgomery Bell State Park from 9:30 am to 4:00 pm CT
- Thursday, December 2 at the New Eastern Region Extension Office, Knoxville from 9:30 am to 4:00 pm ET

Registration is on SUPER for these inservice trainings. Don't forget to register so we can plan lunch arrangements.

Lunch and travel (mileage) for Extension personnel will be covered by FWF.

One (1) pesticide point is available for attending the training session

A few of the subjects addressed in the inservice training include:

1. Emerging Forest Technologies and Issues: Biomass, Bioenergy, Carbon Credits, Certification, Carbon Sequestration
2. The Role of Forests in Farm Businesses
3. Update on Forest Pests, especially EAB and TCD
4. Coalescing Absentee Forest Landowners as an Extension Audience
5. Forest Management Planning Required for Cost-Share Programs
6. Forest Taxation Updates
7. Contemplating a Timber Sale --- New materials

We look forward to working with each of you in natural resources education and hope to see you at the inservice training. If you have questions, contact Wayne Clatterbuck at 865-974-7346 or wclatterbuck@utk.edu.

CUMBERLAND PLATEAU ONLINE ENCYCLOPEDIA

Wayne K. Clatterbuck, Professor, Forest Management and Silviculture

After several years of preparation, the Encyclopedia of Cumberland Plateau Forest Ecosystems (http://www.forestencyclopedia.net/p/p3721) is now available online as part of the Forest Encyclopedia Network (home page -- http://www.forestencyclopedia.net/. The peer-reviewed information is very comprehensive and includes the following

- Landscape: Discussions on the physical, biological, and cultural landscapes of the Cumberland Plateau
- Resource Management: Discussions on the management of natural resources (timber, wildlife, aquatic life, and recreational opportunities) on the Cumberland Plateau
- Ecology: How natural and anthropogenic disturbance events impact forest ecosystems and species ecology on the Cumberland Plateau

The authors are Dr. Justin Hart, an Assistant Professor in Geography at the University of Alabama and former graduate student in geography at the University of Tennessee and Dr. Wayne Clatterbuck, Professor in the Dept. of Forestry, Wildlife & Fisheries at the University of Tennessee. Funding support for this project is acknowledged through the USDA Forest Service, Southern Research Station, Upland Hardwood Ecology and Management Work Unit.

TREE TOLERANCE

Wayne K. Clatterbuck, Professor, Forest Management and Silviculture

The simplest definition of the tolerance of an individual plant is: “The ability of that individual to compete with other individuals within a limited growing space.” Foresters usually define tolerance as the ability of a tree to grow and develop in the shade of other trees. However, “shade,” in this sense involves more factors than merely light. The influence or competition between trees is ultimately a function of the total site. Thus, competition cannot exist between two individuals until they make demands upon a common site that are in excess of the supply.

Foresters give careful consideration to tolerance when applying silvicultural treatments to multi-species stands, but they frequently disagree on the level of tolerance characterizing different species. Disagreements usually arise because trees vary in tolerance not only among species, but also with age, edaphic site, climate, and the nature and the combination of associated species. For example, some species are relatively tolerant throughout life, some are more tolerant when young than when older, and some are more tolerant when older than when young. Eastern white pine is more tolerant during seedling and small sapling stages than in later life. Usually young tree of most species exhibit greater tolerance than they do when they are old. Tolerance for a species will also vary from location to location based on environmental gradients.

Although there is little disagreement between tolerance extremes, i.e., tolerant and intolerant, disagreements occur between adjacent tolerant classes, i.e., intolerant and very intolerant or intermediate and intolerant. A few generalized observations about tolerance and forest management are listed below.

- Highly tolerant trees can reproduce, grow, form persistent understories and force their way upward through overstories of less tolerant trees (examples are hemlock and sugar maple). Intolerant trees, in contrast, reproduce successfully only in the open or where the overstory is thin. Intolerant trees maintain themselves in dense mixtures only as part of the upper canopy and commonly are not present after one generation unless there is major disturbance.

- Highly tolerant trees form understories that are very persistent with minimal growth of individuals for many years. The ability to recover from long suppression indicates high tolerance.

- Intolerant trees do not persist as an understory, and even if released before death, they usually do not recover or they respond very sluggishly.

- Highly tolerant trees have deep, dense crowns, and the leaves are usually darker in color (more chlorophyll) than those of intolerant trees. The lower side-branches of highly tolerant trees fail or are slow to self-prune even though the trees are in a dense stand.

- Intolerant trees have thin, open crowns of relatively pale green leaves, all of which must receive ample light to remain functional. Most of these trees grow rapidly, self prune forming a higher percentage of clear wood, and form overstories quickly.

- Fully-stocked stands of highly tolerant trees tend to have more stems per acre than stands of intolerant trees of equal age or height.

- Height growth is more rapid for intolerant trees than that of tolerant trees although tolerant tree usually live to greater ages. Intolerant trees are relatively short-lived.

- Ordinarily, tolerant trees have harder, denser wood, grow more slowly, and live much longer than intolerant trees. Tolerant trees are apparently more efficient at carrying on photosynthesis at low light intensities and low temperatures than intolerant trees. Tolerant trees are also more efficient in the use of water and nutrients under conditions of extreme competition.

Since tolerance of any species is somewhat variable and difficult to quantitatively measure, it has been customary to measure tolerance in relative terms. General scales of tolerance are working tools only, subject to discretion in their interpretation by the practitioner. Five classes of tolerance based on survival, vigor, and growth under living canopies and under normal growing conditions are usually recognized. Common tolerance classifications for species in Tennessee are below.

Very Tolerant	eastern hemlock, American beech, sugar maple, hollies, hornbeam
Tolerant	blackgum, dogwood, red maple, box elder, buckeyes, redbud, persimmon, sourwood
Intermediate	most white oaks, eastern white pine, hickories, white and green ash, elms, bald cypress, yellow birch
Intolerant	most red oaks, yellow pines, sweetgum, yellow-poplar, black walnut, black cherry, river birch, sassafras, sycamore, eastern redcedar
Very Intolerant	cottonwood, willow, black locust

Opinions as to the relative tolerance of different species will vary somewhat among different practitioners with different local experience. Commonly, practitioners estimate the tolerance of any particular species to be one category removed, plus or minus, from what is suggested in the previous paragraph.

Generally in silviculture, the more tolerant species can be more easily managed in mixed stands, and especially under uneven-aged conditions, than can the less tolerant species. If intolerant species are managed in mixtures with tolerant species, the intolerant trees are maintained usually as dominants or codominants. Otherwise, trees that are classified as intolerant will not survive in the subcanopy. Thus, intolerant species are manageable for only one generation. Many intolerant species can be managed with considerable success as even-aged groups (group selection) within mixed, uneven-aged stands. If intolerant species are to be maintained across generations, then even-aged systems using clearcutting or shelterwood regeneration methods are recommended.

FROM ACORNS COME SEEDLINGS

David Mercker, Extension Specialist, Forestry

As an Extension Specialist, few subjects in forestry provoke greater enthusiasm than acorns. Every autumn, inquiries are common regarding how to collect, store, and plant acorns. It would seem simple, but there are a few things one should know in order to have a successful project. These include:

1. Wait until most of the acorns are dropping from the tree before collection. Early falling acorns may be aborts due to insect damage or drought.
2. Remember that an array of wildlife will be seeking the acorns due to their high carbohydrate content; so don't wait too long for collection.
3. Over-collect, then visually inspect them and discard rejects. Place the rest in a bucket of water. Discard those that float to the top because floaters indicate internal damage – a sure sign they are not viable.
4. White oak acorns can be planted immediately. Red oak acorns must undergo a stratification period (cold storage). Lightly wrap red oak acorns in moist paper towel and store in an unsealed zip lock bag. Place in cold storage for a minimum of eight weeks. Check periodically to make sure the towel remains damp but not soaked.
5. Plant them in full sun, two to three times the depth of the seed, varying this as you go. Water the seedbed after planting. You may have to cover the seedbed with chicken wire to prevent squirrels and other rodents from digging them up.
6. Mulching will help conserve soil moisture.
7. Lightly water periodically through the winter as needed.
8. If the seedlings are to be transplanted, first allow them to completely finish the growing season and undergo two to three heavy frosts. This will assure dormancy.

For more information on growing oak and other seedlings from seed, refer to the U.S. Forest Service Woody Plant Seed Manual at: http://www.nsl.fs.fed.us/wpsm/

ENVIRONMENTAL PRODUCT DECLARATIONS FOR WOOD

Adam Taylor, Associate Professor, Forest Products

Environmental Product Declarations (EPDs) are eco-labels that list facts about the environmental impact of products. EPDs are like a nutrition label but instead of calories and grams of fat, they report data such as lifecycle carbon footprint, water consumption and recycled content. It has been suggested that EPDs may eventually be required for all products, so that consumers can choose products with less environmental impact. If they do eventually become common practice, EPDs will confirm what we already know: wood products almost always have fewer environmental impacts than alternative materials made from concrete, metals or plastics.

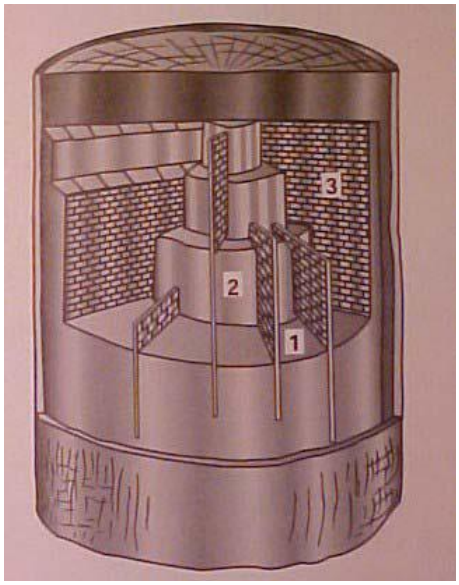
EPDs are intended to provide objective, comparable data for various products. EPDs do not claim that the product is environmentally preferable: it simply discloses what its environmental impacts are. EPDs are based on Life Cycle Assessments (LCAs). The determination of EPDs and LCAs are covered by internationally accepted (ISO) standard protocols. LCAs involve adding up all of the energy and material inputs and outputs from making, using and disposing of a product. These standards include requirements for independent evaluation of the claims made.

The EPD standards require that a Product Category Rule (PCR) is written for each product group. This Rule would set the guidelines for what information would be used to evaluate the product in the EPD. For example, a "flooring" category would allow consumers to compare the environmental impact of hardwood flooring, ceramic tiles and linoleum on an equal basis – i.e. square feet of floor covered.

EPDs are a relatively new idea that is just beginning to be discussed in the United States. The EPD system is more developed in Sweden, Japan and Australia. It is unclear at this point how quickly EPDs will be developed for American products, or if the labels will ever be required. Because of lot of LCA data exists for wood products, EPDs could be developed for these products relatively easily. And, based on these LCA data, we already know that 'wood is good' in terms of environmental impact.

TREE COMPARTMENTALIZATION

Larry Tankersley, Extension Specialist, Forestry



When a tree is wounded, decay fungi infect the site of the damage. To protect itself against the spread of decay to healthy tissue, trees are able to seal off or compartmentalize the wounded area . Trees lay down barrier walls to prevent decay spread in four directions.

Wall 1–the tree responds to the wound by plugging the upper and lower vascular elements to limit vertical spread of the decay
Wall 2–the last cells of the growth ring limits inward spread of decay fungi.
Wall 3–ray cells compartmentalize decay by limiting lateral spread.
Wall 4–(not shown), the new growth ring that forms after injury.

The tree barrier walls prevent decay from spreading in four directions. Plugging inactive xylem cells prevents the vertical spread of damage. Plugging summerwood cells in the interior annual rings prevents inward spread of decay. Ray cells are activated to resist decay movement laterally. Finally, the injury creates an outer barrier. This barrier seems to be strongest, explaining why many trees continue to grow forming healthy outer layers despite a hollow, decayed interior. **Ever wonder why trees don't just rot away?**

Trees do not "heal" themselves, but compartmentalize damage, and continue to grow around and over the damage.

ESTIMATING LIVE AGE OF WHITETAIL BUCKS TO ACHIEVE QDM SUCCESS

Craig A. Harper, Professor, Wildlife Management

One of the cornerstones of quality deer management (QDM) is achieving a balanced age structure in the deer herd. Of course, this involves allowing young bucks to reach older age classes. QDM programs strive for bucks to reach at least 3 years of age before harvest. Age of bucks is most often estimated by antlers; however, hunters often confuse larger antlers with older bucks, and this is not always the case.

Antler size is a product of age, nutrition, and genetics. If a buck is killed when young, it has no chance of producing a large rack. Therefore, hunters must allow bucks to reach maturity if they want to kill deer with large antlers. If a buck lives to maturity, but nutrition is limited, antler size may still be relatively small. Available nutrition first goes to body growth and function. Only after those requirements are met, will additional nutrition go into antler production. Only if a buck lives to maturity, and nutrition is not limiting, can the genetic potential of that animal be expressed. Of course, the genetic traits of every animal are different; thus, some bucks are inherently able to grow larger antlers than others. That being said, there are very few bucks that wouldn't please the vast majority of hunters if the genetic potential of those animals is expressed at maturity.

Antler restrictions are usually implemented to help bucks reach older age classes. Common antler restrictions include 4 points on one side, 8 points total, a spread minimum that might range from 12 – 15 inches, or a minimum antler score based on the Boone and Crockett (B&C) scoring system. *Depending on the area you are hunting*, various antler restrictions are successful in enabling bucks to reach a certain age. The only way to know if an antler restriction is applicable, and for which age classes it is applicable, is to evaluate the antler characteristics of bucks by age class within an area.

For example, if yearling (1 ½ years old) bucks in a given area only produce 2 – 6 points, a 4-point-to-a-side or an 8-point-total restriction would eliminate yearling buck harvest. However, many 2-year-old deer in that area might grow racks with 7 or more points. The spread of the 2-year-olds then would need to be evaluated. If the average spread of 2-year-old bucks was less than 15 inches, then a 15-inch spread restriction would protect most of the 2-year-olds. But, what about the "upper end" 2-year-olds? They would be eligible for harvest. It is most desirable to allow bucks to reach at least 3 years of age before being eligible for harvest in a QDM program. Thus, a minimum B&C score could be implemented to protect all of the 2-year-olds. Let's say a minimum score of 120 inches is used to protect all of the 2-year-old bucks. Then, there will be 3-, and possibly some 4-year-old bucks in the population that might not score 120 inches. What about them? Should they be eligible for harvest, even if they don't meet the score restriction? If the goal is to allow bucks to reach at least 3 years of age before harvest, the answer is "absolutely"! *According to your deer management objectives*, there is nothing wrong with harvesting bucks, regardless of antler size or characteristic, if the buck has reached maturity.

At this point, it should be obvious bucks must be aged on the hoof, and antler characteristics should be used only as a *clue* to identify a buck's age. Body conformation characteristics can be used to estimate age, and learning these characteristics by age class is important to successfully achieve a balanced age structure. Without any reference to antlers, a general description of body characteristics by age class is described below. This information comes from ***Observing and Evaluating Whitetails*** by Dave Richards and Al Brothers. It is an excellent reference, with hundreds of explanatory color photos, available through the Quality Deer Management Association (800-209-3337).

Yearling bucks are easy to identify with slim faces and necks. Their body is also slim and their legs appear long (in relation to body size). Two-year-old bucks still appear long-legged and their back and stomach are generally taut. The neck and body is larger than a yearling, but the face still appears larger than the neck from the front and long from the side. Three-year-old bucks exhibit a fuller neck and deeper chest, which, for the first time, appears as large, or larger, than the rump. The stomach and back are still straight and taut. The face no longer appears larger than the neck. When bucks reach 4 years of age, for the first time, their legs do not appear relatively long, and may appear slightly short for the body. The neck and body will appear more muscular and full, but still relatively trim. The stomach and back will not sag. In a QDM program, a 4-year-old buck is a prime target. If the vast majority of hunters ever saw and could get a shot at a 4-year-old buck, they would take it.

Identifying characteristics for older bucks are given in ***Observing and Evaluating Whitetails***. For most QDM programs, it is a real achievement for bucks to reach 4 years of age before harvest. Using body characteristics to estimate the age of bucks requires practice, just like learning to judge antlers. Of course, this can be frustrating if no mature bucks are present! However, if young bucks are not shot, the population will ultimately include mature animals. Using references such as ***Observing and Evaluating Whitetails*** will help ready you for field judging live bucks.

WILDLIFE MANAGEMENT CALENDAR FOR DECEMBER

Craig A. Harper, Professor, Wildlife Management

Wildlife Notes

Black bears and chipmunks begin hibernating
Gray and fox squirrels are breeding
River otters begin breading
Mink, muskrat, and bobcat fur are prime
Northern mourning doves migrating into TN
Migrating woodcock numbers peak
Waterfowl numbers often peak in December, according to the weather
Owls and hawks increase vocalization and are establishing territories just prior to mating season
Christmas Bird Count conducted in late December

Habitat Management

Do **not** mow (bushhog) old-fields if you have any interest in wildlife

- mowing at this time destroys much needed winter cover
- mowing accumulates thatch, limits mobility, and suppresses the seedbank
- wait until late March/early April and burn and/or disk the field
- if you just can't burn or disk, at least wait until early April (just prior to nesting seasons) before mowing
- burning or disking are preferable strategies for setting back succession and maintaining old-field early successional areas
- refer to Chapter 6 in *Native Warm-Season Grasses: Identification, Establishment, and Management for Wildlife and Forage Production in the Mid-South*, , PB 1752 for additional information on managing early successional habitat for wildlife

Early successional areas (old-fields) may be burned or disked in December, but this disturbance should be held off until late winter/early spring if possible

- setting back succession later in the season (March) will allow winter cover to stand through the season
- burning/disking now however may be necessary if considerable acreage needs disturbance, but may be difficult pending wet weather.
- **do not burn/disk all available cover in one year – leave at least one-third to be managed next year**
- Ideally, disturbance, whether burning or disking, should be completed in a block pattern rather than strips

Disk firebreaks around fields and woods (if it's not too wet) before the ground freezes

- Disking now will stimulate forbs next spring and will enable you to burn when conditions are favorable

It is not too early to conduct dormant-season burning in woods (hardwoods and pines) to reduce fuel loads and enhance conditions for wildlife; when the weather is right, get it done: this is especially important if you have a considerable amount of acreage to burn; if you wait until March, you probably won't get it all done

- obtain permit from Tennessee Division of Forestry
- make sure firebreaks are in place
- only burn when duff layer (below leaf litter) is moist (not usually a problem in December)
- remove woody debris from around the base of desirable trees to avoid damaging the tree
- primarily use a backing fire with relatively low flame heights (6-8 inches)
- refer to *A Guide for Prescribed Fire in Southern Forests* for additional information on using prescribed fire

Native warm-season grasses can be planted during the dormant season

- don't plant too deep – no more than ¼ inches!!
- don't forget preemergence weed control next April/May; it is critical!
- refer to Chapter 5 of *Native Warm-Season Grasses: Identification, Establishment, and Management for Wildlife and Forage Production in the Mid-South,* PB 1752 for additional information

Continue to strip-mow or silage-chop dove fields to provide seed and hunting opportunities

- don't cut it all – leave some for January/February
- strips can be disked and top-sown with winter wheat (w bushels per acre) to provide additional forage opportunities
- migrating doves appreciate your efforts and the late dove seasons can offer great shooting

Spray perennial forage food plots for weed control if necessary

- Refer to *A Guide to Successful Food Plots: Blending Science with Common Sense*, PB 1769, for specific information

Fertilize winter forage plots containing oats, wheat, and/or cereal rye

- 30 pounds of N per acre
- P and K according to soil test

Soil test now for spring plots

- applications of lime require about 6 months before full effect on pH is realized

Plant trees/shrubs for wildlife

- plant trees/shrubs in blocks at end of fields and in "odd" areas

Establish hedgerows across fields with soft-mast bearing trees and shrubs

- hedgerows can be used to break up fields into sections
- hedgerows should be at least 50 feet wide – a single row of planted shrubs/trees with at least 25 feet of fallow growth of black berry, forbs, etc. o neither side
- **spray tall fescue and other undesirable grasses before planting!**

Fertilize/prune trees/shrubs for increased soft mast production

- this is for trees/shrubs out in the open, not those in woods

Continue Timber Stand Improvement activities

- stimulate growth among oaks, beech, cherry, persimmon, blackgum, and other mast producers by killing surrounding competitors
- girdle unwanted trees and spray wound with appropriate herbicide
- a 50% solution of Garlon 3A and water and/or a 25% solution of Arsenal and water work well

Spray Chinese privet and Japanese honeysuckle

- spraying the green foliage of these species now prevents harming dormant desirable species
- 5% solution of Garlon 3-A or 1% solution of glyphosate herbicide and water works well for honeysuckle
- 3% solution of glyphosate herbicide works well for privet

Build brushpiles from thinned trees and pruned limbs

- Put large limbs on bottom and small limbs on top for crevice space and overhead protection
- This is best done and the effect greatest along the edges of and within high-quality early successional habitat (native forbs and grasses with scattered brambles and shrubs) where good cover already exists
- Building brushpiles along a woods edge adjacent to a tall fescue pasture or hayfield may do more harm than good because all rabbits present will then be isolated for predation

Erect boxes for wood ducks and bluebirds

- 1 box per 100 yards of shoreline is adequate for wood ducks
- clean out old wood duck boxes and replenish fresh wood shavings (about 4-6 inches)
- screech owls and squirrels may use the boxes through winter
- repair/install predator shields if necessary
- bluebird boxes should be no closer than 80 yards apart
- up to 9 or more bluebirds may roost in a single box on cold nights

Put out bird feeders and keep them full

- refer to *Improving Your Backyard Wildlife Habitat*, PB1633, for information on specific feeders and seed for birds

Flood waterfowl impoundments

- a depth of 8-12 inches is ideal for dabbling ducks
- duck number should be rising – watch the weather!

Wildlife Damage/Population Management

Close crawl spaces under the house and check for openings in the attic

- helps keep snakes, skunks, and squirrels from getting into places where they are not welcome
- rodents are caching food for the rest of winter; take action now to keep them out of your house
- glue boards are very effective in trapping mice, snakes, and lizards looking for a warm place inside your basement or garage

Blackbirds and starlings have gathered into large winter flocks

- don't allow them to roost in your trees; if they start, they'll form a habit
- repel them with noise makers (shotguns, firecrackers, banging metal pans together)
- be persistent

Vultures may be problematic around structures and livestock holding areas

- scare tactics using firearms and pyrotechnics are effective – persistence is necessary
- it is against the law to shoot a vulture
- contact USDA Wildlife Services for severe problems

Refer to *Managing Nuisance Animals and Associated Damage Around the Home*, PB 1624 for additional information on wildlife damage management.

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