the animal is acting aggressively or unusually it may have rabies; in this case, stay away from the trapped animal and call a veterinarian, animal control, or the local WGFD office. Skunks are often unintentionally caught in live traps creating another problem. In this situation, use a large piece of plastic or unwanted tarp and approach the trap using this as a shield, then drape the plastic over the trap and wrap it up to haul it away or release it.

Killer traps work well as long as pets, kids, or non-target animals are not in the area. When disposing of the dead animal, make sure and wear a long-sleeve shirt, pants, gloves, and insect repellent. Dispose of the animal in a place pets and other animals cannot get to. If you have neighbors close by you may want to visit with them before starting so that they are aware and can keep animals in and kids away. Also, when using kill traps be aware of all the animals that are in your area. If you are using bigger traps that may catch fox or badger, for example, then you will want to contact your local WGFD office or game warden to find out the laws on trapping furbearing animals. You may have to obtain a license.

Wildlife can be a very enjoyable part of the rural lifestyle if one knows how to live with them. This section provides just a brief overview. There are many other sources of information to help with handling problem wildlife or creating habitat for desired species. For more information, contact your local WGFD, University of Wyoming Extension, conservation district, or Natural Resources Conservation Service office.

Rex Lockman *is the wildlife and range specialist with the Laramie County Conservation District.*

Weeds, ways to

What is a weed, and why should I care about them? Weeds are simply plants growing where you don't want them to be. If a plant interferes with your management goals, it is considered a weed. Weeds know no boundaries, and they aren't just a problem of agriculture production. They impact small and large acreages, urban and rural properties, roadsides, rangelands, riparian areas, and forests. Just a few biological characteristics that allow weeds to flourish are their life cycles, growth habits, and reproductive abilities, which allow them to out-compete other plants. Add land-use issues such as overgrazing, past land history, and human-caused disturbance and we begin to see why weeds can be so persistent on our lands. With proper weed management strategies, you can help assure your property will maintain the desirable qualities that led you there in the first place.

There are nuisance weeds – these are usually annuals that appear after some sort of disturbance. Construction, agriculture activities, flooding – anything that causes seeds in the ground to be redistributed or "disturbed" and gives them the opportunity to grow. Disturbed lands are also vulnerable to weed seeds blowing in from neighboring lands. Kochia, Russian thistle or tumbleweed, and common lambsquarters are typical nuisance weeds (not listed as a Wyoming designated noxious weeds). Then there are the weed species that cause significant environmental and economic

whip 'em
(or at least keep them from whipping you)

harm. Weeds in this category are considered "noxious" and are so aggressive that they are regulated by state and federal agencies. These species are usually non-native invasive plants that require a greater amount of effort to control. In Wyoming, these species are regulated by the Wyoming Weed and Pest Control Act. Weeds in this category include species such as Leafy spurge, Canada thistle, and Yellow toadflax. (For a complete listing and information on Wyoming's designated noxious weed species as well as each county's "declared" noxious weed species, go to www.wyoweed.org or talk to your local weed and pest district office).

If you have acreage with grazing animals, a proper grazing management plan is a useful weed control mechanism and will help ensure that your property remains productive. Healthy pastures also help ensure healthy livestock. A healthy stand of desirable plants will typically out-compete the weeds. Most of Wyoming is a high plains desert. Depending on your location and property size, your property may not be able to sustain grazing animals for more than a few weeks. Rotational grazing (moving animals between two or more pastures) aids in weed control because it gives beneficial plants the opportunity to rest after grazing and then grow undisturbed before being grazed again. Grazing management alone, however, may not correct serious weed problems. Most weed species are not eaten by grazing animals as they choose more desirable plants for consumption. In heavily infested or overgrazed pastures, this pattern of continually grazing the desirable plants creates a downward spiral in the health of the pasture, allowing the weeds to flourish.

Just as all weeds are not created equal, neither are the treatment methods used for successful weed control. Many of the nuisance species require nothing more than mechanical control measures such as mowing or hand pulling. Of course when you factor in the amount of time you have to allocate to your weed management program, you may choose several methods to keep your property free of these species. (Or at least get them under control).

Different weed species require different control methods, and in most situations several methods, or an "***integrated***" approach, is usually most effective. The methods that may be incorporated to eliminate the nuisance species noted above may actually encourage complex perennials (like Canada thistle) to grow more! This integrated approach takes this into account and uses all the tools we have in our weed control toolbox.

So which method is the right one for the target species?

The method used to control weeds depends on many variables such as management goals, resources available (time and money), future plans, identification of target species, pasture availability, and location to name a few. Here are some ***guidelines*** to consider when choosing treatment methods:

1. **Group** the weeds into two categories: **broadleaf (non-grasses)** and **grass** weeds.
2. **Identify the target species:** Proper identification (ID) will assist in choosing the right method. Wrong ID equals wrong treatment equals waste of resources equals no weed control! **If you do not know what the weed is, find out before proceeding!** Weed and pest districts, University of Wyoming (UW) Extension, and others in the community may be able to properly identify your "weeds". If you have a weed on your property that turns out to be a "noxious" weed, you also may qualify for "cost share" programs where local weed and pest districts contribute to part of the cost of control.
3. Consider the **life cycle** of the plants:
   - **Annuals** – (complete their entire life cycle in one season) ONLY reproduce via seeds.

- **Biennials** – (live two seasons; usually grow a rosette or cluster of leaves close to the ground the first year and the following season put up a flower stalk, set seed, and die) ONLY reproduce via seeds.
- **Perennials** - (live longer than two seasons).
  - simple – having a taproot or fibrous root and ONLY reproduce via seeds.
  - complex – have creeping underground rhizomatous root systems and reproduce not only from growth points on the root located every ½-inch or so but also via seeds. Take a piece of this root and move it to another area and, BINGO!, there's a new weed growing where you didn't have one before.

It is crucial to know the life cycle of the target plant to choose the right treatment method.

Choose the best **method of control for the target species.** In general**:**

- **Annual** species respond to mechanical control and cultural controls to a certain extent. Remember the only thing you are trying to accomplish is eliminating seed production. Most annual weeds such as kochia and Russian thistle can be mowed; however, they will respond to the height of your mower and start producing seed at 3 inches or the height of your mower deck. Depending on the size of the infestations, you may have to hand pull, mow, hoe, or use other mechanical means. If the area is too large, consider using herbicide treatments. Remember that whatever method you choose, there are many seeds left in what's called the "seed bank" in the soil; these seeds will also germinate under favorable conditions. This could mean flushes of new growth several times throughout the season (or for many years to come).
- **Biennials also respond to** mechanical control because, like annuals, they only spread by seed. Manual removal of either annuals or biennials may be time consuming so you may have to consider other methods. If you choose to use an herbicide, don't wait until the annual or biennial weeds are big enough to hide your children and dogs. ***All methods of control are more effective if you treat these weeds early!***
- **Tap-rooted perennials (those having a single main root that goes straight down)** may be mechanically removed if the entire root is removed. The size of the infestation and the amount of time available will play a role in the control/removal methods chosen.
- **Complex perennial** weeds such as Canada thistle, field bindweed, or whitetop may require chemical treatment as it is almost impossible to remove the entire root system. ***The proper herbicide for the intended species is crucial for effective control of these species.*** Remember some perennials also reproduce by seed so you may have to incorporate mechanical methods as well. If you successfully control the existing growth you'll need to be on the lookout for re-sprouting vegetation or new plants from germinating seed (field bindweed have seeds that stay alive and are able to germinate for 60 years or more in the soil!). Persistence and vigilance are key to controlling complex perennial weeds.

4. Consider **timing**: Proper timing of any method is critical to success. Many complex perennial weeds respond well to fall applications of herbicide as the chemical gets pulled into the root system (along with the "food" compounds the plant is storing for winter) where it's most effective.
5. **Evaluate** throughout the season to determine if the control method(s) is effective. If you have tough perennial weeds, results may not be seen until the following year. Good stewardship is a long-term commitment so think long-term. Change methods if results are not satisfactory.
6. Once again, **consider asking** for assistance. Weed and pest districts, UW Extension, Natural Resources Conservation Service, and conservation districts are among your options.
7. **Enjoy**! Weed control is the result of planning, implementation of your plan, and persistence. Now you can sit back and watch the grass grow, play a football game, garden, or ride your horses. Don't forget to keep an eye open for some weedy suspects moving into your weed-free areas! And remember to monitor the areas you treated for satellite plants you may have overlooked.

The weed management toolbox

Choosing the correct method saves time and money. The integrated approach uses all the tools we have in our "Toolbox" of weed control.

- ***Prevention:*** By far the easiest form of control!
  - Maintain healthy, desirable vegetation. If you don't have any ... plant some perennial grasses. Proper watering, fertilizing if needed, managed grazing, etc. make a difference!
  - Use weed-free end products (topsoil, sand, gravel, trees, shrubs, compost, manure, etc.). Ask suppliers if their products are weed free.
  - Limit disturbances. Disturbed soil is a prime target for new weed species to move into.
  - Ensure equipment brought on your property is clean of dirt and debris that may contain weed seeds or plant parts. Clean this equipment before moving it to the next location.
  - Have a ***plan***! A grazing management plan is essential if you have grazing animals. Your local University of Wyoming Extension, NCRS, or weed and pest office can help develop one for your property.
  - ***Don't purchase or plant invasive species***. Replace invasive plants in your garden with non-invasive alternatives. Information is available from weed and pest districts, Natural Resources Conservation Service, nurseries, publications, Internet, etc. If it is invasive elsewhere, there is a good chance it will be invasive on your property, too!
- ***Cultural:*** Knowing what previous land-use practices were and how this may impact your efforts. These practices include burning, grazing, crop rotation, pasture rotation, crop selection, the planting of cover crops, etc.
- ***Mechanical:*** Just as you thought, these are practices that involve manual labor…mowing, hoeing, hand pulling, etc. This also includes the use of mulch and weed-suppressing plastics and fabrics.
- ***Chemical:*** Use of herbicides to control weed species. ***Not all herbicides are created equal!*** Different types include:
  - ***Selective*** – damage or kill only broad-leaved plants or grasses (not both),
  - ***Non-selective*** – have potential to kill or damage all plants they contact
  - ***Pre-emergent*** – applied before the weeds appear
  - ***Post-emergent*** – applied after weeds begin growing
  - ***General use*** – may be purchased by any adult
  - ***Restricted use*** – must have a license to apply
- **Biological control** – This is the use of a biological agent (such as an insect, disease, pathogen, etc.) to *control or suppress* weed spread. Use of these "agents" will not eliminate the weed! These are usually released in areas difficult to access. Contact your local weed and pest office for information on available agents and applicability to your situation. Also use of grazing animals (goats, sheep, cattle) to target specific weeds. This eliminates the top growth only. For complex perennials, a combination of methods is usually necessary for eradication.

Developing your Weed Management Plan

1. Define your goals. Be realistic. If you inherited a weed problem, it may take several years to effectively control the weeds. Include the amount of time and money you can spend on the project.
    a. Short-term – If noxious weed species or poisonous weeds are present, these will be a priority. Focus on controlling these species, especially if found along a travel corridor. Roads, irrigations ditches, etc., are pathways these species move along to un-infested areas. Not sure if you have any noxious species? Contact your local weed and pest control district and schedule a survey of your property. Telephone numbers, along with a list of noxious weeds and other information, is available at www.wyoweed.org. Many noxious species may have cost share (the district will pay part of the cost of control) associated with them.
    b. Long-term – Establish parameters for what you consider acceptable as far as weeds on your property. (Remember, noxious weeds have regulatory statutes regarding control). Do you want to increase forage production? Do you wish to maintain only "native" species on your property? Whatever your goals are, after a weed survey has been completed and infestations located, work on establishing a weed-free perimeter around your property. You can do this for each "parcel" or pasture you own. Determine where the outer edges of each weed infestation are located, and target treatments working from the outside toward the center of the infestation. This helps keep you to systematically treat weeds and keeps you from "chasing" them from one area of your property to another.
2. Survey your property. Inventory not only the weed species that may be present but also the desirable plants or areas you wish to maintain as is.
    a. Make a map. NO GPS ... No problem. It doesn't have to be fancy. Plain paper and pen work just fine. The purpose of drawing a map and locating key species or areas is to allow you to be able to assess whether your plan is working and if you are meeting your goals.
    b. Take pictures. A picture is worth a thousand words. Photos will also help assess the effectiveness of your treatment.
3. Develop your plan. Using the information from the above steps and that are provided in the rest of this section, begin to determine what strategies will be utilized in your plan. Do you have nuisance species in your pasture? Are noxious weeds taking over a riparian area? Use the integrated techniques suggested. Will you be mowing, pulling, or using herbicides? Are you doing spring, summer, and fall treatments? Remember that plant species, densities, and severity of the problem will help determine correct methods. Time and money are going to play a key role in your plan. Remember to get estimates if you are unsure of the cost of services or supplies. Ask for assistance from resource experts in your area. The Natural Resources Conservation Service, University of Wyoming Extension, and weed and pest districts are a few that may be able to help.
4. During planning remember that re-vegetation (re-seeding, etc.) of severe infestations after the weeds are under control may be necessary. There is nothing like a healthy stand of perennial grasses and forbs to assist in keeping weeds at bay.
5. Implement your plan. Mow, apply herbicide, graze, or hand pull. Whatever you wrote down on paper, take it to the field! Spend an entire season putting your plan into action. For some annual weeds, you will see results of your efforts this season; however, for perennial weeds, whether noxious or not, you may have to wait until the following spring/summer season to determine if your plan was successful.
6. Monitor your results. Survey your property on a regular basis. Bring out the maps and the photos. They will be great tools in determining the success of your plan. You may have to alter some components of your plan depending on the results. Timing of your control may have to be altered, or perhaps a different herbicide may produce better results. Remember that weed management is not a quick fix or a one-time event. Good land stewardship is a long-term commitment. Once major weed problems have been addressed, it will require less resources to maintain. Continual monitoring is vital for long-term success of any weed management plan.

Common Mistakes

- **Incorrect ID** of weed resulting in wrong treatment method.
- **Improper herbicide** selection/timing/application. ***You must match the right herbicide to the right plant species***. Some herbicides have no activity on certain plants. Seek the assistance of qualified personnel such as weed and pest districts in choosing the right product! Herbicides also have specific uses in regard to the areas you may be applying – agricultural use, turf use, range and pasture, aquatic, etc. Herbicide labels provide this type of information.
- Purchased the **cheapest** herbicide. Some less expensive herbicides are better suited to annual or biennial weeds. Perennial species, especially those of the noxious variety, may require a specialty herbicide to eliminate the weed infestation. (Contact your local weed and pest district for recommendations.)
- **Used more** than the recommended amount of herbicide. More chemical does not necessarily mean better control. **Read the label as these *instructions are requirements, not recommendations!*** This is especially important in treating ***complex*** perennials. Many herbicides are slow to act. In the case of those perennials, slower activity is better! If too much herbicide is applied, you may damage the top growth too quickly. This will keep the plant from absorbing enough of the herbicide through its leaves to kill the whole plant, and it will recover.
- **Didn't follow through** with *retreatment* – severe infestations may require several years of treatment! **Persistence** is your weapon against weeds.
- **Always consider where the product is to be used. Will it be used near:**
  - Ditch banks
  - Riparian areas
  - Vegetable or flower gardens
  - Lawns
  - Pastures
  - Shrubs or trees

Then ask yourself these questions:

- Is damage to non-target plants (plants in the area to be treated that aren't weeds) acceptable?
- "Residuals" – Herbicides can remain active for varying lengths of time after application; some herbicides have long residuals (stay active a long time) while

Common Herbicides

The following are some common general-use herbicides. No license is required to buy or apply these products. The following are *general* recommendations. Your situation may be unique and have specific elements that require other methods. **Always read the label** to ensure you are using the product in a manner consistent with the labeling. ***Label instructions are requirements, not recommendations*!** Consult your weed and pest district or other qualified entity for proper selection of herbicides – especially if ***"noxious"*** weeds are present. The common names of active ingredients are listed first. Many herbicides with the same active ingredients are available under a variety of trade names. This listing does not imply an endorsement of any particular product manufacturer.

2,4-D Amine. Sold by various manufacturers with various trade names – Selective **post-emergent** herbicide. Effective on many annual broadleaf plants if treated early.

Has a turf label.

Also effective on most biennials when treated in rosette stage, including musk thistle, houndstongue, burdock, etc.

2,4-D Amine + Dicamba. Many products available such as Weedmaster® or Clarity® – Selective **post-emergent** herbicide. Effective on many annual weeds and SOME perennial species only with **repeated** applications (showy milkweed, field bindweed).

Glyphosate. Found in Roundup® , Buccaneer®, or Cornerstone®. – Non-selective herbicide – effective on most broadleaf and grass plants.

No residual – *only kills what is green, what is growing, AND what it touches*!

Good on some perennials in the fall (Canada thistle)

Safe in flowerbeds, gardens, around trees – as long as the herbicide doesn't contact non-target species!

One of the most non-toxic herbicides available. Targets a specific enzyme found only in plants.

Trifluralin. Found in Treflan® and Preen® – A pre-emergent herbicide, these products prevent annual weed seeds from germinating. Can be used in perennial flower beds, gardens (after *ALL* desirable species are established), and around driveways. Must be incorporated or watered in.

others have short ones. Will anything be planted on the site in the future? If so, you may want to choose an herbicide with a short residual, or be sure the herbicide won't affect the new type of plant.

- What resources do I have to control weeds (cost/time)?
- Can I mix this herbicide with other herbicides in my sprayer tank (tank mixes), or will one product inactivate the other? For many weed species with a thick waxy cuticle, a surfactant or adjuvant may be necessary. These products act as stickers, prevent rapid evaporation of product, or assist in the penetration of the herbicide through the leaf surface. The herbicide label will provide examples of herbicide mixtures and other products that may be added to get the best results. **Always read the label**!
- What time of year is the best for effective application of this herbicide?
- Many weed species are more susceptible to herbicides at specific growth stages. The product label will have this information, or contact your local weed and pest district.

Used properly, herbicides can be an effective tool from your toolbox. While they shouldn't always be your first option, in many instances, (especially for tough noxious species) they are an economical, useful component of integrated weed management.

For lots of information regarding weeds and weed management, check out the Barnyards & Backyards website at barnyardsandbackyards.com.

Mary McKinney *is the assistant supervisor of the Park County Weed and Pest Control District*

Common problematic weeds in Wyoming

Yellow toadflax

Russian knapweed

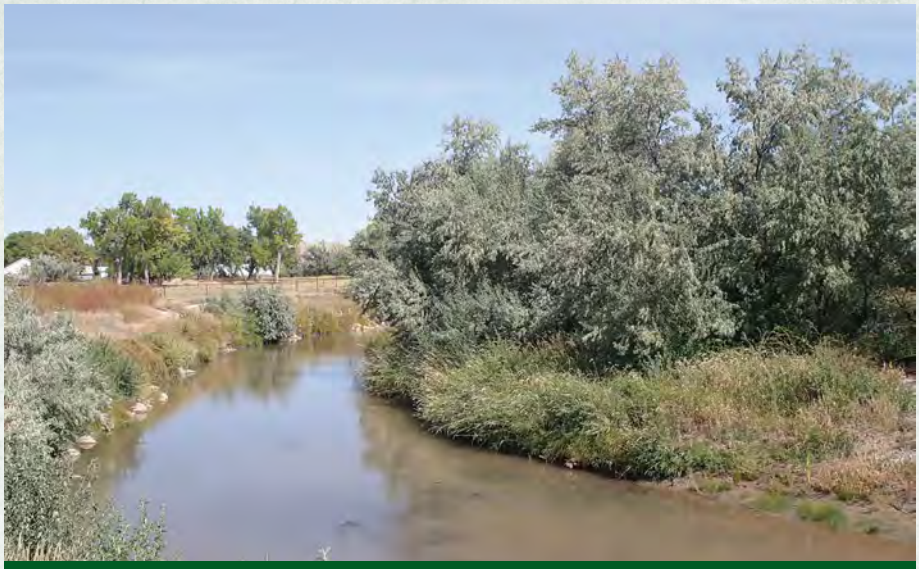
Houndstongue flower

Houndstongue seed

Leafy spurge

Canada thistle

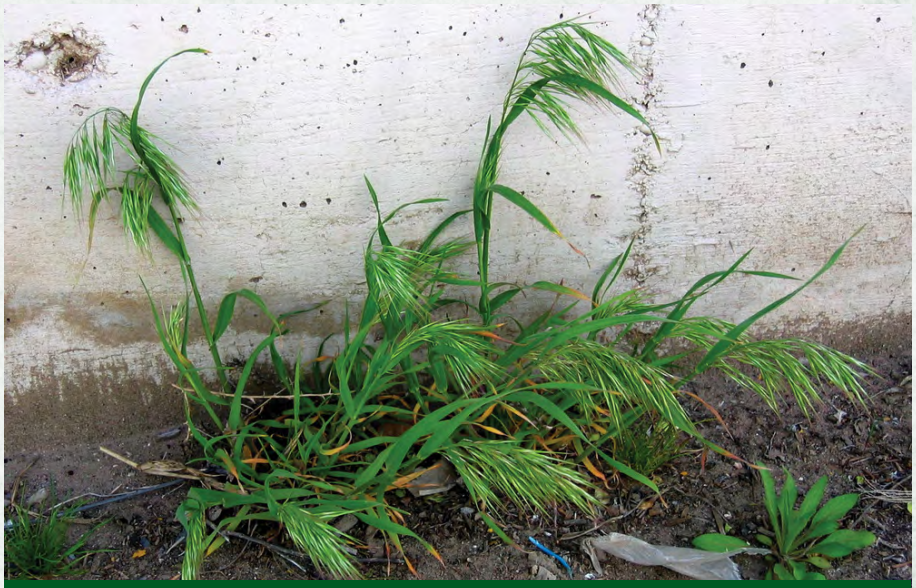
Perennial pepperweed



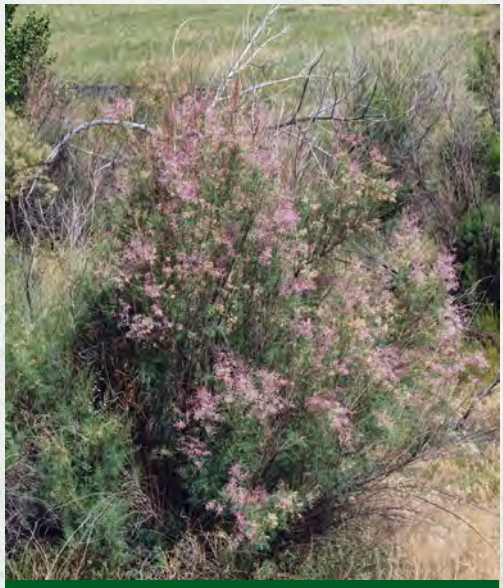
Russian olive (foreground)

Spotted knapweed — potential hybrid

Scotch thistle



Cheatgrass



Saltcedar tree