

Wildlife Watering Facilities - Guzzlers

A wildlife watering facility may be a guzzler, spring development, pond, wetland, or other type of water supply. This Technical Note provides specifications for guzzlers.

General guidelines:

Guzzler is a term used to describe self-filling, constructed watering facilities that collect, store, and make water available for wildlife.

Supplemental water is generally not a limiting factor for native Colorado upland wildlife species. Refer to Wildlife Species Models (WSMs) to determine whether adding water to a site will remove or improve a limiting factor. The planner and client may decide to add wildlife water for reasons other than removing a limiting factor. In cases where limiting factors are not addressed, upland wildlife habitat management (645) will not be reported.

The major components of guzzlers are a rain and snow collecting apron made of concrete, rubber, plastic, metal, or treated soil; a storage tank; and an escape ramp. A float system or a trough may also be needed depending on the design. An escape ramp is required in all watering facilities.

The following technical information will help determine spacing and volume needed in wildlife watering facilities for the targeted animals.

Site Selection:

- 1) A guzzler should be placed outside gullies, arroyos, or draws to avoid flood damage and siltation and should be protected from sunlight as much as possible. Orienting the tank so that the open end faces north helps keep water temperatures down and will minimize evaporation if no shade is available. South facing slopes are preferable to north facing slopes to help with thawing in the winter.
- 2) For all watering facilities, a nearby food supply is critical for use by the selected wildlife species.
- 3) Other critical habitat components may be satisfied by planting a shrub thicket adjacent to the watering facility. Thickets provide escape, forage, and loafing cover for a number of birds, enhancing the habitat value of the facility. Some shrubs that provide these values include Skunkbush sumac, American plum, Rocky Mountain juniper, Gambel oak, Chokecherry, Buffaloberry, Winterfat, Four-wing saltbush, and Big sagebrush. Refer to ecological site indices to select appropriate shrub species for a given site.

Spacing:

Spacing of watering facilities is based on estimated distances wildlife will travel to water. The following distances are suggested spacings for watering facilities (Hoffman, et.al. 1993, Rintamaki 1986, SCS 1973, Schmidt 1996).

Species	Optimum (Miles)	Maximum (Miles)
Pronghorn antelope	2	3-4
Mule deer	0.5	1
Elk	0.5	1
Chukar	0.5	1
Most quail species	0.5	1
Pheasant	0.5	1
Turkey	1	2
Mourning dove	3	5

All guzzler designs must be approved by someone with adequate delegated job approval authority. The following information may be helpful in determining size of apron and storage needed.

Typical Wildlife Water Use Chart (Schmidt, 1996):

Pronghorn antelope	1-2 gal/animal/day
Mule deer	1-2 gal/animal/day
Elk	5-8 gal/animal/day
Chukar	750 gal/covey/year
Most quail species	750 gal/covey/year
Wild Turkey	7 gal/100head/day
Pheasant	2-5 gal/flock/day (year round)
Mourning dove	2-5 gal/flock/day (year round)

Efficiency and life spans of apron materials are (Kie et.al. 1996):

- Steel - 98%, 25 years
- Asphalt roofing - 86-92%, 8 years
- Plastic covered with 1 inch of gravel - 66-87%, 8-15 years
- Butyl rubber - 98%, 15-20 years
- Asphalt paving - 95%, 15 years

Water storage needs are calculated using the low number in the average annual precipitation range along with the expected number of animals and their water needs. Colorado precipitation maps are available at: <ftp://ftp.ftw.nrcs.usda.gov/pub/ams/prism/maps/co.pdf>

The tank should be sized to hold enough water for the target species for one year. The apron should be sized to fill the storage tank once each year (assuming 100% water harvest). Potential yield of the apron surface can be calculated using the following formula based on the lowest average annual precipitation amounts. For example, if you are located in the 14-16 inch precipitation zone, you would use 14 inches as your expected precipitation amount.

$$\text{Apron size (sq. ft.)} = \frac{\text{Gallons needed} \times 12}{\text{Average minimum precipitation} \times 7.48 \times \text{Efficiency}}$$

Example: A small flock of pheasants (20 birds) uses 2 gallons of water per day or 730 gallons/year (2 gallons/day x 365 days/year = 730 gallons/year). In this example, we are located in a 12-14" precipitation zone, so we use 12" as our average minimum precipitation. We want to use a round apron on a prefabricated guzzler. Plug these numbers into the above equation and the result is (730 gallons x 12) / (12 x 7.48 x 0.98) = 100 sq. ft. (apron size). For a round apron, this equates to an 11.3 ft. diameter apron. The closest size in prefabricated guzzlers is 12 feet in diameter so you would select the 12 feet diameter, round guzzler design that will hold at least 730 gallons of water. The tables at the end of this document provide common design sizes.

Additional Requirements, Concerns, and Considerations:

All guzzlers will be filled after installation and during prolonged dry periods.

Consider whether the purpose for installing guzzlers is to attract wildlife or to remove a limiting factor for the target species. A guzzler may concentrate wildlife in one spot, creating the potential for predation and disease.

Use fencing to control livestock access to the guzzler. If a water development is for both livestock and wildlife, consider developing and fencing out a separate wildlife watering area.

Compensation for leakage and evaporation will require upward adjustments of component sizes and should be considered in the water budget.

Consider the effect this practice will have on water quantity (especially depletions) and advise the landowner to take necessary steps to get permits or water rights needed.

Existing water supplies may be adapted for wildlife following the above guidance. For example, water from a stock pond or a spring development could be used to develop a wildlife watering facility adjacent to the pond.

References:

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Spence, Ed. 1997. Personal communication on practical aspects of guzzler installation.

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Guzzler Designs

Gallons needed per year	Average Precip. Amount	Efficiency	Square Feet of Apron	Diameter of Round Apron in Feet	Dimensions of Square or Rectangular Aprons
Pheasant-1 small flock					Planner must calculate using number from square feet column
730	10	0.98	120	12	
730	12	0.98	100	11	
730	14	0.98	85	10	
730	16	0.98	75	10	
Quail or chukar- 1 covey					
750	10	0.98	123	13	
750	12	0.98	102	11	
750	14	0.98	88	11	
750	16	0.98	77	10	
Turkey-20 birds					
550	10	0.98	90	11	
550	12	0.98	75	10	
550	14	0.98	64	9	
550	16	0.98	56	8	
Deer or Pronghorn-10 animals*					
3650	10	0.98	598	28	
3650	12	0.98	498	25	
3650	14	0.98	427	23	
3650	16	0.98	373	22	
Elk-10 animals**					
18250	10	0.98	2988	62	
18250	12	0.98	2490	56	
18250	14	0.98	2134	52	
18250	16	0.98	1867	49	

The planner may use the above table to calculate guzzler sizes for different species, numbers of animals, or other precipitation values. For rectangular or square aprons, the planner will need to calculate area.

* Multiple guzzlers should be considered.

**Multiple guzzlers should be used in this situation. When calculating number of guzzlers needed, divide total gallons per year by number of guzzlers desired, then use this number in the gallons column. The spreadsheet will calculate the apron size required.

Water Yield Calculations

Round Apron Diameter in Feet	Average Precip. Amount	Efficiency of Apron Materials	Apron Area in Square Feet	Yield in Gallons = Storage Tank Size*
4	10	0.98	13	77
8	10	0.98	50	307
12	10	0.98	113	691
16	10	0.98	201	1228
4	12	0.98	13	92
8	12	0.98	50	368
12	12	0.98	113	829
16	12	0.98	201	1474
4	14	0.98	13	107
8	14	0.98	50	430
12	14	0.98	113	967
16	14	0.98	201	1720
4	16	0.98	13	123
8	16	0.98	50	491
12	16	0.98	113	1105
16	16	0.98	201	1965

*The planner must compare the gallons yielded with the number of gallons needed for the targeted species. Be sure to use the correct precipitation amount for your location.