NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

MONTANA INTERIM CONSERVATION PRACTICE STANDARD

FABRICATED SHELTER FOR LIVESTOCK (FEET)

CODE 771

DEFINITION

A fabricated structure to provide shelter and protection to livestock for environmental purposes.

PURPOSE

- Provide shelter for livestock from wind, snow, extreme temperatures, and sunlight to protect environmentally sensitive areas such as riparian areas, woody draws, and forested areas.
- Provide alternative livestock shelter locations in feeding areas to prevent the buildup of manure and to prevent erosion.
- Improve wildlife habitat by enhancing riparian areas.

CONDITIONS WHERE PRACTICE APPLIES

- On rangeland or pastureland where alternative shelter locations are needed to prevent livestock from overusing sensitive areas of woody vegetation.
- On feeding areas where alternative shelter locations for livestock are needed to prevent the buildup of manure and to prevent erosion.
- On rangeland and pastureland where live windbreak/shelters are not suited, or where temporary shelter is needed while living windbreaks are becoming established.
- A portable shelter may be constructed to facilitate nutrient management and erosion control.

CRITERIA

General Criteria Applicable to All Purposes

Shelters shall be constructed of wood, metal, fiberglass, or other durable materials capable of withstanding expected site specific wind loading and environmental conditions.

Panel spacing shall provide a minimum of 20 percent and a maximum 30 percent open area.

Shelters shall be mounted about 12 inches above the ground or ground cover if used for snow protection. This allows the wind to sweep the snow downwind from the fence.

Panels shall be a minimum of 1–inch x 6–inch lumber or 28 gauge galvanized steel.

Boards or panels shall be attached on the livestock side of the fence. Install a horizontal rub rail on the outside if livestock have access to both sides.

The fabricated shelter shall be located on the windward side of the area to be protected and oriented as close to perpendicular to the prevailing wind as possible.

The shelter shall be offset to the side and to the rear of an open-front resting shed a minimum of 16 feet. This provides a "swirl" chamber to the side and reduces wind in front of the shed.

Additional Criteria for Improving Wildlife Habitat

Utilize the fabricated shelter during the times of year that riparian areas are most susceptible to damage by livestock.

NRCS, MT
February 2004

Conservation practice standards are reviewed periodically and updated if needed. To obtain the current version of this standard contact the Natural Resources Conservation Service.

NOTE: This type of font **(AaBbCcDdEe 123..)** indicates NRCS National Standards.
This type of font (AaBbCcDdEe 123..) indicates Montana Supplement.

CONSIDERATIONS

Livestock shelters should be designed to decrease forage or feed needs of livestock, decrease the amount of feed loss from wind, and to decrease odors, dust and insects carried by summer breezes.

A single tall fence is more effective and economical than a series of shorter fences.

Both 90^0 V-shaped and semi-circular shelters display similar drifting patterns and provide a snow-free, reduced wind speed area for animals in areas with variable wind directions.

Porous fence provides a greater zone of protection from snow and wind than solid fences.

Maintenance requirements for cattle increase about one percent for each 1 degree Fahrenheit when ambient temperatures fall below the lower critical temperature (LCT). The LCT is the point at which animals must increase their rate of metabolic heat production to maintain homoiothermy.

Wind velocities increase 10-20 percent and higher when it goes around the end of a shelter. TABLE 2 has been adjusted to accommodate for increased wind velocity at the end of the shelter.

TABLE 2. Number of Animal Units (AU's) Protected by Barrier Heights H. (Meiman, 1993)

HEIGHT (H) (FT)	WINGS(L) (FT)	WIDTH (D) (FT)	AREA[1/] (A) (FT^2)	UA'S
6	60	84.85	3,963.6	79
8	80	111.14	7,046.8	141
10	105	148.49	11,823.5	236
12	125	176.78	16,828.1	336
14	145	205.06	22,713.5	454

[1/] Area of protection zone with 60-80% wind reduction for cattle.

For maximum efficiency, the uninterrupted length of a shelter should exceed the height by at least 10:1. This ratio reduces the influence of end-turbulence on the total protected area.

It is recommended that buildings, cattle yard areas, feed storage, etc., should be located about 185 feet beyond and downwind from the outside or windward shelter to avoid snow accumulation in those areas.

Consideration should be given to offsite effects.

Supporting practices should be applied where water erosion, nutrient runoff, and/or runoff from melting snow may be a hazard.

In areas with significant drifting snow, consider erecting a snow fence 100 feet to the windward side of the fabricated shelter to store snow outside the protected area.

Consideration should be given to site drainage. In areas lacking adequate natural drainage, constructed drains may be required.

PLANS AND SPECIFICATIONS

Plans and specifications for this practice shall be prepared for each site. Specifications shall be recorded using approved specifications sheets, job sheets, narrative statements in the conservation plan, or other documentation.

The Montana Specification 771–Fabricated Shelter for Livestock is required for this practice.

Requirements for the operation and maintenance of the practice shall be incorporated into site specifications.

OPERATION AND MAINTENANCE

Operation:

The following actions shall be carried out to insure that this practice functions as intended throughout its expected life. These actions include normal repetitive activities in the application and use of the practice (operation).

Maintenance:

The fabricated shelters must be inspected periodically and protected from damage to maintain proper function.

Repair and upkeep of the practice (maintenance) must include:

- Replacement of broken or damaged wood slats, fiberglass, or corrugated metal.
- Regular weed control as needed to maintain the site.

REFERENCES

Jairell, R.L. and R.A. Schmidt. 1991. Taming Blizzards for Animal Protection, Drift Control, and Stock Water. Proceedings, The Range Beef Cow Symposium XII, Dec. 3-5, 1991, Fort Collins, CO. 11 pgs.

Johnson, D. Windbreak/shelter Fences. 1975. Great Plains Beef Cattle Feeding Handbook, GPE-5200. p. 5200.1-4.

Jones, D.D. and W.H. Friday. Wind and Snow Control for the Farmstead. Energy Management in Agriculture AE-102, Purdue University Cooperative Extension Service. 11 pgs.

Meiman, P. 1993. Cost Analysis of Wind Protection Structures for Range Beef Cattle. Range Livestock Problem, University of Wyoming RGMG 4540-03. 15 pgs.

USDA–Natural Resources Conservation Service, Field Office Technical Guide, Section IV–Practice Standards and Specifications:

- 380–Windbreak/shelter/Shelterbelt Establishment, January 2000.
- 528A–Prescribed Grazing, June 1994
- 590–Nutrient Management, July 2000
- 595–Pest Management, August 2000
- 645–Upland Wildlife Habitat Management, February 2000.

USDA-Natural Resources Conservation Service. 1999. Core 4 Conservation Practices. p. 142-145.

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

FABRICATED SHELTER FOR LIVESTOCK (FEET)

CODE 771

MONTANA INTERIM CONSERVATION PRACTICE SPECIFICATION WORKSHEET

OWNER / LANDOWNER _____ RANCH LOCATION _____ DATE _____

FIELD NO. / CONTRACT NO. _____ JOB CLASS _____

SCOPE: This specification provides guidance for the installation of fabricated shelters for livestock on rangeland, pastureland, and feeding areas.

Primary Purpose: (CHECK ALL THAT APPLY)

q Provide livestock shelter to protect riparian areas, woody draws, or other areas.
q Provide alternative shelter location for feeding areas.
q Improve wildlife habitat.
q Other (SPECIFY): _____

Kind of Livestock:

q Beef Cattle q Horses q Sheep q Swine q Other (SPECIFY) _____

Number of Livestock (AU's): _____

Type of Shelter:

q Permanent q Portable q Temporary

Materials:

Panel Material:

q Wood q Horizontal
q Corrugated metal q Vertical
q Fiberglass

Panel Size: _____
Panel Gauge: _____
Spacing between slats/panels: _____

Frame Material:

q Wood
q Steel
q Sucker Rod

Frame Size: _____ Frame Spacing: _____
Frame Gauge: _____
Depth of upright supports on permanent shelters: _____ (ft.)
Length of the toe on portable shelters: _____ (ft.)

Location and Layout:

Width: _____ (ft.)

Length: _____ (ft.)

Prevailing wind direction: _____

Shape:

q V-shape

q Circular

q L-shape

Total area of zone protected/sheltered: _____ sq. ft.
(BASED ON HEIGHT AND WIDTH OF FABRICATED WINDBREAK/SHELTER)

Plan Design: Job Sketch

Additional Specifications and Notes:

Additional treatment needed: (CHECK)

q Fencing

q Prescribed Grazing

q Windbreak/Shelterbelt

q Water Development

q Other (SPECIFY): _____

JOB SPECIFICATION SHEETS NEEDED TO APPLY THIS PRACTICE

q 528A–Prescribed Grazing

q 382–Fence

q 561–Heavy Use Area Protection

q 645–Upland Wildlife Habitat Management

q 380–Windbreak/Shelterbelt Establishment

q Other (SPECIFY): _____

SPECIAL PROVISIONS:

q None

q See Attached Sheet

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OWNER / LANDOWNER	RANCH LOCATION	DATE

FIELD NO. / CONTRACT NO. _____ JOB CLASS _____

NRCS APPROVAL:

PLANNER—USDA–NATURAL RESOURCES CONSERVATION SERVICE	JOB APPROVAL AUTHORITY	DATE
ENGINEER—USDA–NATURAL RESOURCES CONSERVATION SERVICE	JOB APPROVAL AUTHORITY	DATE

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I hereby certify that this practice has been established in accordance with these specifications.

USDA–NATURAL RESOURCES CONSERVATION SERVICE	DATE

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ACTUAL FIELD CONDITIONS:

Date of Installation: _____