Corral Design and Operation For Improved Handling Efficiency and Reindeer Safety

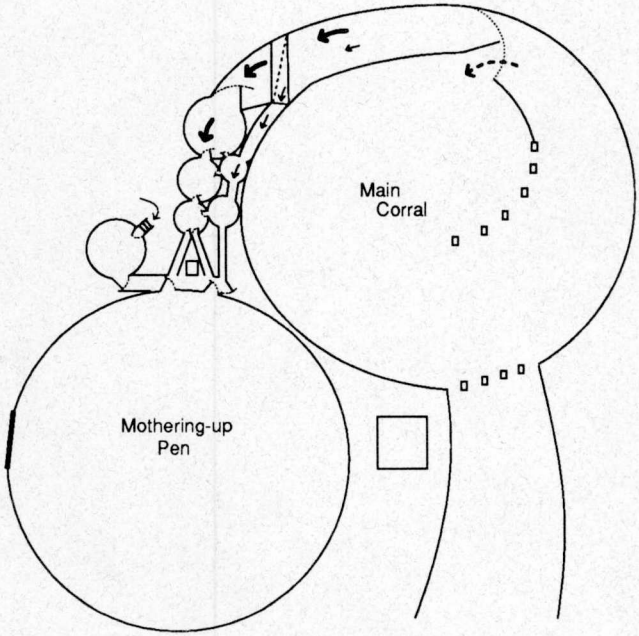
by

Bill Thompson
Research Assistant,

Robert Dieterich, D.V.M.
Professor Emeritus,

and

Lyle A. Renecker, Ph.D.
Assistant Professor



"Circular (University of Alaska Fairbanks.)"
Agricultural and Forestry Experiment Station
School of Agriculture and Land Resources Management

Circular 86 April 1992

Corral Design and Operation For Improved Handling Efficiency and Reindeer Safety

by

Bill Thompson, Robert Dieterich, and Lyle A. Renecker

Introduction

Reindeer in western Alaska have been described as a free-ranging, semi-domesticated animal. Herd management is minimal and animals are less tractable when compared to domestic livestock. Consequently, when reindeer are moved through a corral system they are more susceptible to stress. Stress can occur as a result of circumstances that are related to nutritional, social (crowding), induced psychological or physiological trauma, and parasitic problems, all of which can be interrelated. Excessive stress can reduce herd productivity by lowering reproductive rates, weight gains, survivorship, and immune response. Stress during corralling can result in trauma from overcrowding and trampling, inadequate food and water, disturbance of normal behavioral patterns, and exhaustion. Proper corral design and its operation play a vital role in both prevention of injury and the level of stress the reindeer experience.

The University of Alaska's Applied Reindeer Research Project has had a unique opportunity to observe corral designs throughout Alaska. What follows is a description based on these observations. It is understood that each corral must be "personalized" for each herd, however, the following suggestions should be a benefit when designing, refurbishing, or working animals in a reindeer corral.

Background

When designing a corral, the reindeer's natural instincts and **behavior** must be considered. A corral that is designed to take advantage of these traits will help prevent excessive excitement and thereby stress. The following behavioral traits have been observed in reindeer in western Alaska:

1) Reindeer mill or circle in the same direction.
2) Reindeer shy away from dead ends in a runway. Reindeer can be easily moved when they are not being pushed into what they perceive as a dead end.
3) Reindeer are disturbed by loud noises. Yelling, slamming doors, etc., frighten the deer, thus making them more difficult to handle. Keeping the noise level down will maintain calmer reindeer and therefore induce less excitement.

4) When pressured, reindeer feel more comfortable in larger groups. For example, a group of two or three animals is more difficult to handle than a group of 100 head.

5) Reindeer will not challenge a solid barrier. If reindeer are pressured, they will try to run through a wire fence until burlap is strung across it to make it appear solid.

6) Reindeer are not aggressive towards humans and will avoid them when possible. However, caution should always be used.

The corral system consists of seven sections (Figure 1):

1) Wing fences
2) Main corral
3) Preliminary holding area and fawn separator
4) Holding pockets
5) Chutes
6) Holding pens
7) Support systems

Each section will be described in the order that reindeer would see them as they are moved through the corral.

Wing Fences

Reindeer are driven into the corral between wing fences that are 5-6 feet in height.

These fences are made with either a 5-foot-high section or two 3-foot-high sections of wire netting stapled onto wooden posts. The wire should not be stapled tight to the posts, but left with a quarter-inch gap. This will allow for wire movement due to frost heave. The mesh size should be about 4-6 inches square.

The outer wing fence begins at the corral entrance and should extend at least 600 yards. The inner fence extends from the other side of the corral entrance for about 400 yards. The corral entrance should be 15-20 yards wide while the mouth of the wing fences should be 100 yards wide. The wing fences should slowly curve toward the corral without creating any dead ends. Burlap should cover the wing fences as they approach the corral to direct the deer to what would appear to be an escape route.

The location of the fence should take advantage of the landscape to help move the deer into the wings. Steep banks, deep rivers, ocean beaches, and thick stands of willow or alder are topographical and vegetative features, respectively, that can help. Reindeer prefer to walk in areas that are free of brush and therefore are eager to move into cleared wing areas instead of

shrub vegetation that may surround the area.

Main Corral

The reindeer travel through the wing fence area into the main corral (Figure 1); a large holding area for the animals that are waiting to be handled. The minimum area requirement is 18 square feet of space per animal. Therefore, for a group of 1,500 animals, the main corral would be approximately 185 feet in diameter.

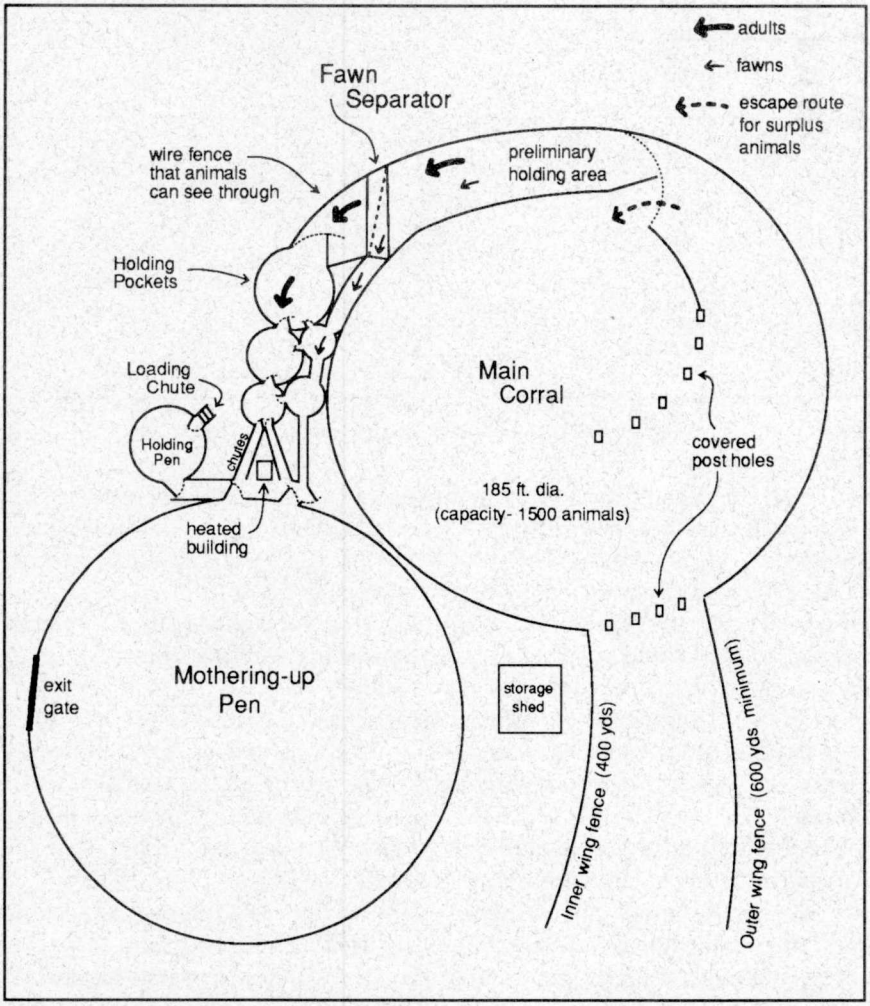


Figure 1. *Corral system, built in seven sections, is designed for improved handling efficiency and safety of reindeer.*

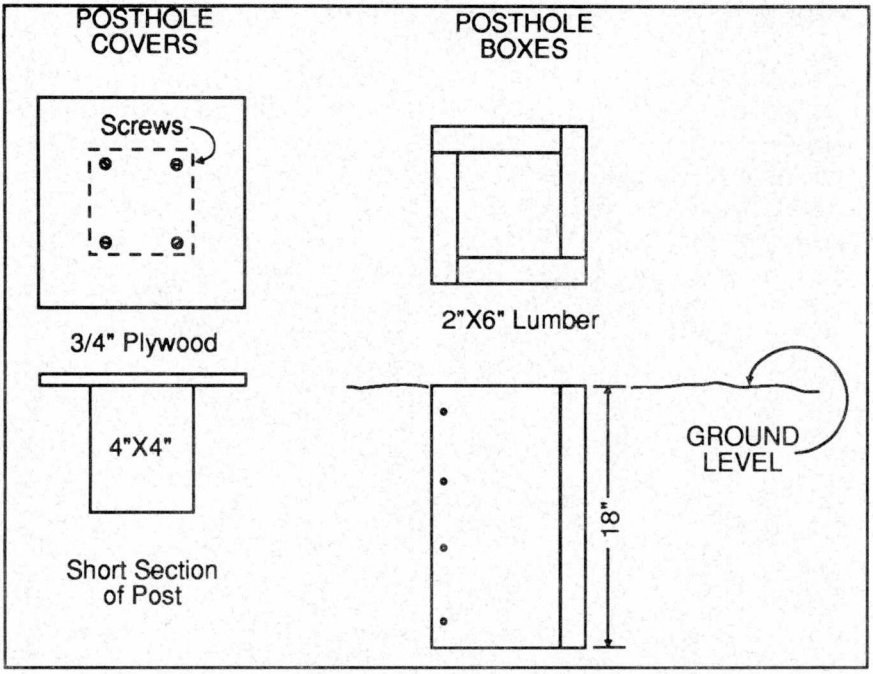


Figure 2. Framed post hole and removable cover.

The perimeter fence of the main corral should be at least six feet high and made of either wire netting or wood. Wood is preferred, but wire will work if burlap is used to create a solid barrier. The burlap must be removed and stored after each handling to allow snow to blow through the wire in the winter and prevent the burlap from rotting during the summer. A fence constructed of wood should be made of panels or sections that can be taken down to allow the passage of blowing snow.

After the reindeer pass into the main corral, a temporary fence can be constructed at the entrance to prevent the deer from exiting. This temporary fence can be made of wooden panels or wire netting attached to 4 in. x 4 in. posts which are placed into reusable, framed post holes (Figure 2). Burlap must be used on the wire netting to create a solid barrier as the deer will always attempt to exit where they entered.

Within the main corral, there is another temporary fence that can be added after the reindeer have entered (Figure 1). This fence reduces the size of the main corral to help separate small groups of deer from the main herd. This is especially helpful when the group size is small. Moving a small group of animals in a large corral is very difficult and a temporary fence to reduce the size of the holding area makes the job easier. This fence is

designed to be erected and removed quickly. Framed post holes can be installed and burlap strung between posts placed in the holes.

The main corral, as well as the entire corral system, should take advantage of the reindeer's natural tendency to mill in the same direction. If they mill clockwise, the corral design should always keep the animals moving in this same direction. Animal movement should flow circularly and have no dead ends or right-angle corners. The deer are more apt to keep moving forward if they do not see a blockade in front of them. Square pens should be avoided and can be dangerous as they tend to crowd up in the corners.

Only the most experienced herders should be allowed to move and separate the reindeer. These herders are experienced in keeping themselves and the deer calm by being **quiet and patient**. A few experienced herders are more efficient than 20 loud, inexperienced workers.

Preliminary Holding Area and Fawn Separator

Small groups of reindeer (100-150) are split off in the main corral and are routed into the preliminary holding area which should be about 40 ft. x 75 ft. The fence should be six feet high and made of wood or wire with burlap. A gate at the entrance to the area lets the animals enter and then contains them. This gate is also used to cut off the desired number of reindeer from the main herd. This gate should swing from a post in the interior fence of the main corral where it joins the preliminary holding area. When the holding area is full, the gate can be closed to prevent too many animals from entering.

As the gate closes on the preliminary holding area, it leaves an opening in the interior fence (Figure 1). This allows those animals that get cut off by the gate to return to the main corral without reversing directions, therefore reducing injuries and trampling.

The preliminary holding area should hold enough deer at all times to maintain a constant flow to the handling chutes. Because this holding area is much smaller than the main corral, moving the deer into the remainder of the corral system is easier and more controlled.

A length of burlap held every six feet and extending the width of the area should be used to move the deer in the desired direction. Workers holding the burlap should stand facing the reindeer with the burlap held behind them. Holding the burlap in this way will prevent people getting knocked over if the reindeer should run through this barrier. The people holding the burlap at the two ends should advance toward the deer a little faster than those in the middle. If a smooth arc is maintained, the deer are less likely to try to run back through the burlap.

During summer handlings, a fawn separator is used at the end of the

preliminary holding area to divide adults from fawns (see Thompson and Dieterich 1990).

Holding Pockets

Once past the preliminary holding area and fawn separator, the reindeer enter holding pockets. These pockets decrease in size as the reindeer are pushed toward the handling chutes. The largest adult holding pocket is about 35 feet in diameter, the next is 25 feet and the smallest is 15 feet. The fawn pockets can be about half the size of the adult pockets. Decreasing the group size from pocket to pocket keeps the deer manageable when having to split them off one at a time into the handling chutes. Fences for the adult pockets should be made of wood, not wire netting. These fences experience pressure, and wire netting does not hold up as well. Fences for the fawn pockets can be constructed of wire netting and burlap but appear solid. If fawns see gaps or holes in the burlap, they will try to jump through and thereby damage their antlers and/or injure their legs. The wooden fences should be made of removable panels which prevent an accumulation of

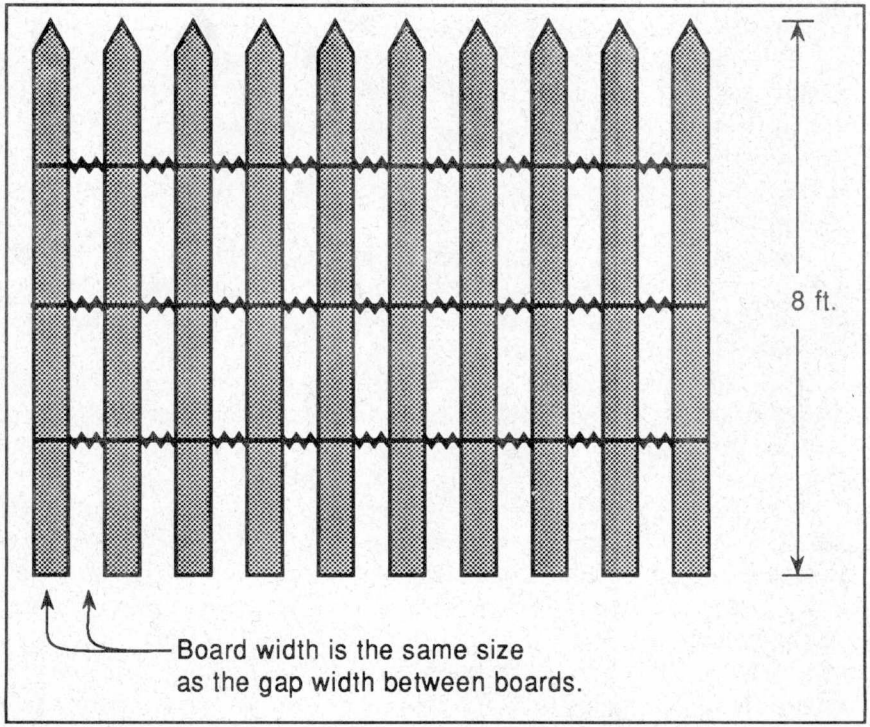


Figure 3. Snow fence can protect the corral from drifting snow.

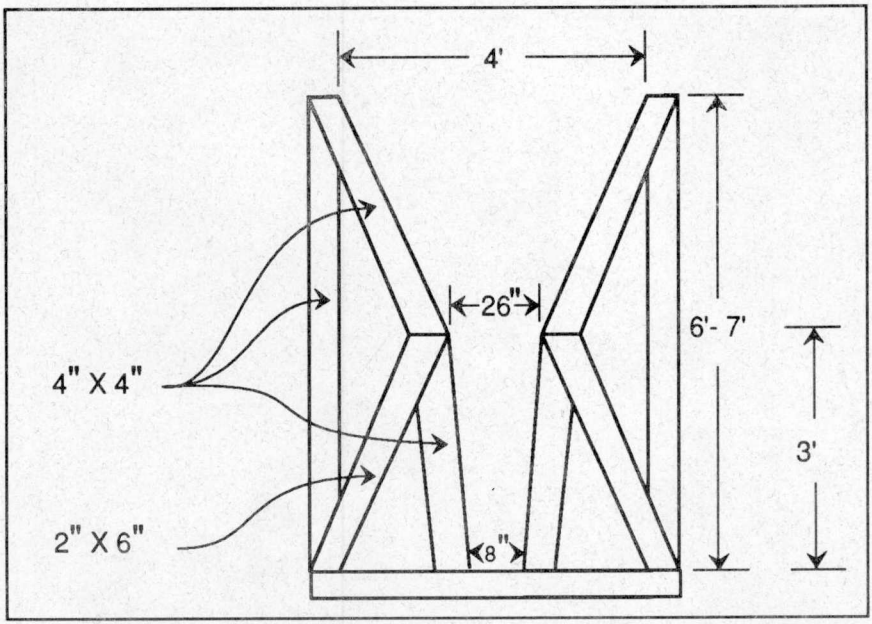


Figure 4. Schematic shows dimensions of the V-shape chute where reindeer are held for injections, ear tagging, and other work.

drifting snow. If removable panels are not feasible, it is recommended that snow fences be used to protect the corral from drifting snow.

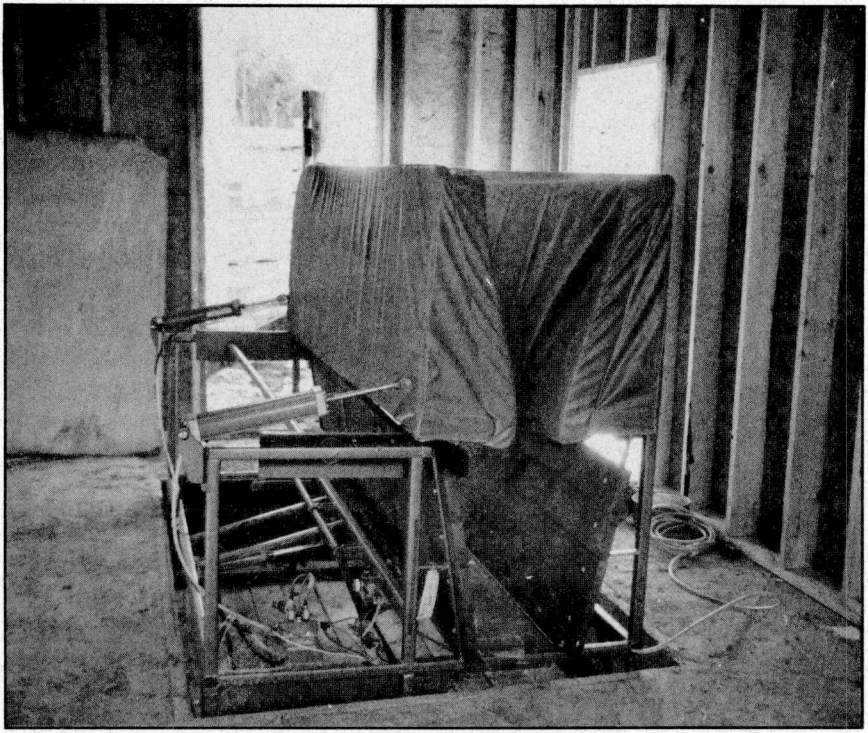
Snow fence should be a material of 50 percent porosity (Figure 3). The distance from the corral system should be equal to 35 times the height of the fence. A series of snow fences can be used, however, one high fence works better and collects proportionally more snow.

The gates of holding pockets should swing from a hinge in a direction that will take advantage of the direction of milling. These gates should be hung from hinges which allow them to be removed without disassembly of the hinge. This is valuable during snow removal, and when animals run into the gate, it will pop off instead of the hinge bending or breaking.

Because a group of deer is easier to handle than one or two individuals, work progresses more efficiently if the pockets are kept full. Trying to move one or two deer out of a pocket is frustrating for the workers and stressful for the deer.

Chutes

The chutes are made in a V-shape with sides about seven feet high (Figure 4). Windows are constructed in the sides to allow workers to hold reindeer for injections, ear tagging, etc. The sides of the chute at the window



A padded deer crush placed at the end of the V-chute offers a more efficient and less stressful way to handle reindeer than windows in the chute.

are only about three feet high, and three feet wide. Reindeer hides are often used to pad the window openings. Sides of the chute should be made as smooth as possible and clear of obstructions to reduce the possibility of injury. Plywood is best and should be secured with screws instead of nails, which can pop out and create hazards. A gate at the end of the chute is helpful in keeping deer from escaping. If the chute is long enough, two sets of windows can be constructed, allowing two animals to be handled at once. Two handling chutes are a better alternative to one chute with two windows. With two chutes there is less confusion among workers and less chance of two animals in the alley hurting each other.

An alternative to windows in the chute is a deer crush placed at the end of the V-chute (Figure 5).

The crush reduces stress on both reindeer and workers. As the animal enters the crush, the padded sides move inward and firmly hold the deer in place. The crush can be operated either manually with a lever action device or pneumatically in summer. Restraint in this fashion is more efficient and safer than physical immobilization by workers. The only drawback is the cost. In 1990, the crush cost about $4,000 (U.S.) delivered from New Zealand.

An air compressor, hose, fittings, etc., cost approximately an additional $1,200. Those who have used the crush in the past say it is well worth the cost. Less expensive crushes could be manufactured locally if the demand for units increased.

The ground around the chute should be well drained but not rocky. Ideally, fine gravel should be used, but a good alternative would be a raised area comprised of a well-drained soil.

Experience has shown that each handling area, whether a window or crush, can process about 50 animals per hour. This estimate includes coffee breaks and meals. Using this estimate, we can calculate the number of deer that can be handled in 12 hours, which is about the maximum period of time reindeer should be kept in the facility. If 50 deer per hour per chute can be processed, then no more than 600 should be put into the corral.

Holding Pens

After animals pass through the chute system, they are either released to the open range or moved into another enclosure. These holding enclosures have several purposes. The reindeer in western Alaska free-range in an area of many thousands of acres. These ranges are not enclosed by fences, and the reindeer travel freely. Often animals wander off their owner's range and are subsequently corralled with another herder's reindeer. They are separated and held in a pen until the end of the handling and then driven to the range of their respective owners.

In the spring, an enclosure called the "mothering up" pen is often used to contain all females and fawns which have been handled. This gives them time to pair-up and re-bond before being released and therefore reduces the occurrence of orphan fawns. A pen may also be needed to hold animals that have been sold until they can be crated and shipped.

Support Systems

A heated, insulated building should be located near the chute system to house computers, to keep drugs from freezing, and to store items such as ear tags, ear notchers, tagging pliers, etc. The size of the building should be a minimum of 8 ft. x 10 ft. Small sliding doors (12 in. x 16 in.) can be made at about chest height to serve as pass-through openings for syringes, blood samples, etc. Double-pane windows should be used to prevent frost-up in winter and positioned such that computer operators can observe the chute while they are seated.

A central covered area that houses equipment such as burlap, hammers, nails, hinges, etc. is beneficial. Tools are readily available for maintenance and an inventory is easily taken when re-ordering supplies. If this building is made large enough a portion could be designated a kitchen and dining area.

Lighting around buildings and chute systems can be supplied by using a generator and high-pressure sodium lamps. The sodium lamps should be placed high enough for good light dispersion and clear of all animal activity. Incandescent lights do not function as well outside because the light is too bright and they require more power. High intensity lights will tend to frighten the animals.

Although it has not yet been applied to a reindeer handling facility, a roof over the chute area would shelter workers from snow, rain, or hot sun. This roof will not only keep the workers comfortable but also provide a dry and therefore safer work area. If a shed roof is not practical, small, one-quarter-inch pea gravel spread around the chute area will help maintain a dry working surface.

Dust caused by the milling reindeer could potentially cause health problems. During dry weather, workers should wear face masks to protect themselves. The dust can become so concentrated that conditions will be dangerous for the workers as they can not see where the animals are running. A sprinkler system can be used to keep the soil moist within the corral and alleviate the problem. A gas-powered water pump at a nearby stream or lagoon can supply the water. The hoses and sprinklers can be mounted on top of the fence posts to keep them out of reach of the reindeer. In this way, most of the corral can be watered by a turn of a valve. Some of the main corral may have to be completed by hand as the sprinklers might not reach the center. Another option may be to spread a good layer of washed stone gravel throughout the corral area. The travel will reduce dust, provide good drainage, and may slow the movement of deer because of the unstable footing.

There is also the possibility of setting up watering troughs along the fence to provide water for the deer.

Concluding Remarks

This paper was not written to be the definitive end to corral design. Situations will be different and there will not be one certain path to follow. The ideas expressed here are intended to provide a basis for intelligent decisions and to help prevent many of the problems encountered when handling reindeer.

Handling animals with as little stress as possible makes sense both morally and economically. Low-stress handlings should be a goal of any person involved with the design and operation of reindeer handling facilities.

Appendix

Preparation for Handling

Take inventory of needed equipment
Order vaccines and parasite control drugs
Order ear tags
Annual maintenance on corral facility
Inform Association and Agency personnel of corralling date

Equipment Checklist

Maintenance Equipment

- hammers
- nails, bolts, screws
- fencing staples
- spare hinges
- saw
- wire cutters
- tool box
- spare fencing
- shovels

Reindeer Handling Equipment

- ear tags
- ear taggers
- ear notchers
- antler cutters
- antler boxes
- rubber bands

Crush

- air compressor
- air hose and fittings
- repair kit
- manual lever or pneumatic piston

Lighting Equipment

- extension cords
- light fixtures
- spare bulbs
- generator

Miscellaneous

- water pump
- garden hose and sprinklers
- oil stove
- fuel oil
- gasoline
- engine oil
- compressor oil
- burlap
- cooking equipment and food
- coffee pot
- tents (if needed)
- first-aid kit
- castrating knives
- disinfectant
- towels
- paper towels

References

Thompson, B., and R.A. Dieterich. 1990. *Construction and use of a fawn separator for injury prevention.* Agricultural and Forestry Experiment Station. Circular 74. University of Alaska Fairbanks.

Zhigunov, P.S., ed. 1961. *Reindeer Husbandry* (translated from the Russian). Published for U.S. Dept. of the Interior and National Science Foundation, Washington, DC., by Israel Program for Scientific Translations.

Rehbinder, C. 1988. Management stress in reindeer. In: Proceedings of the Fifth International Reindeer/Caribou Symposium. Arvidsjaur, Sweden. August 1988 *Rangifer*. Special Issue No. 3:267-288.

Agricultural and Forestry Experiment Station
School of Agriculture and Land Resources Management
University of Alaska Fairbanks

James V. Drew, Dean and Director