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August 1966

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DEER AND THE AINSWORTH CANAL*

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Introduction

Merritt Dam and the Ainsworth Canal were constructed by the Bureau of Reclamation to provide irrigation water for the vicinity of Ainsworth in north central Nebraska. The reservoir was completed in 1964 and at capacity has an area of 2,906 surface acres. The canal commences at the Dam, 27 miles southwest of Valentine, and extends eastward for 52.8 miles to Highway 20 east of Johnstown. The canal, along with 174 miles of laterals and 63 miles of drains, serves to irrigate about 34,000 acres of farmland.

The Ainsworth Canal is lined with concrete along its entire length. In the western sections of 22 miles, the height is 8.4 feet, bottom width is 9 feet, and water depth is 7.22 feet at capacity. In the eastern sections (30.8 miles) the height is 6.5 feet, bottom width is 7 feet, and water depth is 5.3 feet at capacity. Water velocity is 6.22 feet/second in the lower section and 3.4 feet/second in the upper section. Maximum discharge is about 580 cubic feet/second. The canal was completed in early 1965.

Along the canal are 6 siphons, 16 drop structures and 17 bridges. In all, there are 38 places where deer can cross without entering the canal. Five of the siphons are located at creeks and the sixth at U.S. Highway 20. These siphons provide segments through which deer cannot pass and live. Drop structures are not a barrier to movement of deer in either direction during light flows. Under greater flows, deer would probably be unable to move through a drop.

The majority of the canal runs through typical sandhill terrain, with sub-irrigated meadows, moderately rolling hills and rough hills present. Grasses are predominant, with an abundance of forbs and some brush, particularly in the rougher areas. Timber is limited to three stream courses, the Snake River, Gordon Creek and Plum Creek, and to areas where planted by man. Deer densities are relatively low over most of the area, probably about two per square mile. The harvest in 1965 was 0.166 deer per square mile, or 6.0 square miles per deer.

Techniques

During periods of peak incidence of deer, the canal was checked daily by two men in a vehicle. At other times checks were only occasional or involved reports of deer in the canal. In 1965, daily checks were made from May 27 to June 28, and in 1966 the canal was checked daily from May 26 to August 10.

*Presented at the meeting of the Central Mountains and Plains Section of the Wildlife Society, Pingree Park, Colorado, August 16, 1966. This work was performed under the provisions of the Federal Aid in Wildlife Restoration Act, Project W-15-R.

Attempts were made to capture all deer observed by project personnel. If deer could be pushed to the lower end of a drop structure or to deeper water (two feet or more), capture was relatively easy and they were roped. When water was shallower or no drop structure was adjacent it was generally necessary to use a dart gun to capture deer. Each captured deer was ear-marked with two metal tags and colored streamer(s) to designate individuals. Streamer material was plasticized nylon fabric (saflag).

Records were kept of numbers and condition of deer observed in the canal and of those reported by Bureau of Reclamation personnel and construction workers. Post-release observations of tagged deer were recorded.

Findings

Incidence - 1965

Occasional reports were received of deer in the canal during early 1965. At this time there were several dirt plugs in the canal which made escape relatively easy. These plugs were removed in late May, and the frequency of deer observations increased. Water was present in the canal from June 1 to October 10. Average water depth was about one foot through most of this period.

A total of 136 deer was observed by or reported to project personnel. Of these, 75 were tagged and released, 34 escaped capture, 16 were found dead, 7 died in handling, and 4 live deer had been previously tagged. In addition, two of the sixteen dead deer had been previously tagged. A maximum of 130 different individuals was represented in the 136 observations.

Undoubtedly both dead and live deer were removed from the canal, or observed in the canal, which were not reported to project personnel. Also, deer occasionally enter siphons and do not often emerge. An evaluation of losses there is impossible or at least impractical. It is estimated that 200 or more deer were present in the canal during 1965.

Incidence - 1966

In 1966, water flows commenced on May 2. Discharge was low until late May, picked up and decreased several times in June, and reached about half of capacity by early July.

As of August 12 we observed or had reports of 101 deer in the canal. Of this number 33 were tagged, 45 were found dead or had to be destroyed due to extensive injuries, 2 live deer were previously tagged, and the remainder escaped capture or were removed by other personnel. In addition, six of the 45 dead deer had been previously tagged. A maximum of 93 different individuals was represented in 101 observations. Other than probable loss in siphons, this count is probably almost complete, due to better reporting by other personnel.

Species and Age

Species identification was obtained for 120 deer observed in the canal in 1965. Seventy (58 per cent) of these were whitetails and 50 were mule deer. In 1966, of 88 deer which were identified, 64 (73 per cent) were whitetails and 24 were mule deer. For both years combined, 65 per cent of the 208 deer identified were whitetails.

In contrast, the kill in this general area in 1965 consisted of about 27 per cent whitetails. There was no apparent difference between species in ability to escape from the canal, so it is presumed that the abundance of whitetails is due to more extensive movements or movements by a greater proportion of the population, at least during the summer months.

In 1965, sight and capture records both showed an abnormal preponderance of yearlings for both species and both sexes. Of 26 whitetail males for which age data were obtained, 88 per cent were yearlings. In comparison, yearlings constituted about 54 per cent of the adult male kill in this general area. Of 30 whitetail females, 97 per cent were yearlings, compared to 36 per cent in the kill. For 20 mule deer males, 85 per cent were yearlings compared to 64 per cent in the kill. Of 22 mule deer females, 73 per cent were yearlings compared to 36 per cent in the kill.

In 1966, fewer deer were aged due to the lower incidence. Twenty-five whitetail bucks and six mule does were all yearlings. Of 30 whitetail does, 80 per cent were yearlings. None of twelve mule bucks were yearlings.

Peak incidence occurred in mid-June in 1965 and in late June in 1966. The timing of major deer incidence in the canal compares closely with fawning dates. Since yearlings made up the bulk of the deer observed, and since the major incidence coincided with fawning, it is probable that the deer which were trapped were involved in movements associated with breaking of family ties. It is also probable that young deer, fawns of the previous year, travel more extensively than older deer at this time of the year.

Losses and Injuries

Sixty-one dead deer have been observed to date, with 16 in 1965 and 45 in 1966. Most of the losses in 1966 occurred during periods of relatively high (3 feet or more) water levels. Most of the deaths probably occur from drowning while the deer are forced against trash racks adjacent to siphons and drops. Additional losses have undoubtedly occurred. Five deer were observed entering siphons, and only one of these emerged during the next several weeks. Four other deer were observed which were sufficiently decomposed to indicate that they had emerged from siphons.

Most frequent injuries were worn hooves and severed tendons on the front knees. In a few cases the hooves were worn down sufficiently that deer had trouble walking after they were released. In attempting to escape from the canal, deer would often slide back on their front knees and occasionally sever the tendon(s) controlling the front leg(s). Six live deer had one leg injured and four deer had both legs injured in this manner. These were all tagged and released. One of these (with one injured leg) was found dead a few days after release, and none of the others were observed after tagging. Quite probably the deer injured in this manner did not survive.

Five deer were found alive, but in such poor condition that they were destroyed. (1) One had the tendons severed on both front knees, and dislocated bones on both hind legs. (2) Another deer had the bones disjunct on both front legs. (3) One deer had a fracture of the tibio-fibula and a severed tendon on one front knee. (4) Another had both tarsi broken, and (5) another had both tendons severed on the front knees.

Similar injuries were noted on dead deer. In addition, three dead deer had fractures of the knee bones on one or both hind legs. Broken antlers were noted on several deer, both dead and alive.

Movements

Thirteen tagged deer were shot during the 1965 hunting season, and sight records were obtained for an additional 17 deer tagged in 1965. Observations of deer in the canal and short term observations were eliminated, leaving data on 23 deer.

Movements of 10 mule bucks ranged from 4 to 48 miles, with an average of 20.4 miles. Four individuals moved less than ten miles, and four moved 25 miles or more. One yearling buck moved 48 miles within 17 days after release and was observed in this same area about ten months later.

Average movement of four mule does was 20.5 miles, with a range of 3 to 52 miles. A yearling moved 23 miles within 16 days after release and remained in that area for at least 9½ months. The greatest individual movement in this study was by a yearling mule doe, which traveled 37 miles within 93 days and an additional 15 miles within 209 days.

Movements of five whitetail bucks ranged from 9 to 30 miles, with an average of 16.4 miles. Three whitetail does averaged 14.3 miles, with a range of 10 to 21 miles. A whitetail buck fawn moved 19 miles within 35 days after tagging.

Additional observations were obtained for 16 tagged deer, but due to insufficient information they could not be designated as individuals and only minimum movements, to the nearest point on the canal, could be estimated. Movements of these deer ranged from 2 to 28 miles, with an average of 14.4 miles.

Other Species

Other species of animals were occasionally seen in the canal. Several species of snakes were common, particularly garter snakes, bull snakes, blue racers and hognose snakes. Two prairie rattlers were observed. Blanding's and box turtles were common and painted and snapping turtles were occasional.

A dead antelope kid was observed in the canal, and an adult doe was reported. One beaver, two muskrats, one mink, one long-tailed weasel and a coyote were observed. Jack rabbit tracks were common when snow was in the canal. About twelve mallard broods, one blue-winged teal brood and one redhead brood were observed in the canal.

The only completely effective ways to eliminate deer losses would be to cover the canal or to fence it and provide places for crossing. Cost would be quite high for either of these procedures.

In June and July of 1965, the Bureau of Reclamation installed about 60 strips of snow fence, four to eight feet wide, at various locations along the canal. At no time was there evidence of these ladders being used by the deer.

Escape devices, consisting of pipe A-frame deflectors and wooden cleats, were installed in early 1966 adjacent to two of the siphons. A whitetail doe was observed escaping on one of these structures, but this was during lower water levels when deer could often escape at any place along the canal. Deer observations adjacent to these structures were comparatively lower than in 1965. However, variations were also noted in other segments of the canal where no improvements were made.

Four semi-tame deer were obtained and placed in the canal above these structures. Distances from the structures were 200 to 500 yards in four cases, and 1.4 miles in two other tests. Water flow at the time was 295 c.f.s. (half the capacity), with a velocity of about six feet per second. In all tests except one, deer escaped with no difficulty. In that case, the bars on the A-frame had spread and the deer passed between the bars. Spacing of the bars should be about six inches, as deer were observed to pass readily between bars with a ten inch spacing.

These escape structures appear to show great promise for reducing losses. Other types of escape structures, involving ramps with a 3:1 slope, had been planned. However, these would involve modification of the concrete and would necessarily be more costly. Further tests will be made on the present structures with wild deer to determine if there is any difference in reaction. If these prove equally successful, recommendations will be made for additional installations and a significant reduction in losses can be expected.

Summary

During 1965 and 1966, a total of 237 deer were observed in the Ainsworth Canal. Ninety-eight deer were captured and tagged, 61 were found dead or sufficiently injured to necessitate dispatch, 7 died in handling and the remainder escaped or were removed by other personnel. Under full canal operations an annual loss of 100 to 150 deer can be expected unless something is done.

Deer densities are low in this area, and the relatively high incidence is probably due to extensive movements. Movements of tagged mule deer averaged about 20 miles and whitetails moved an average of about 16 miles.

Escape structures are being evaluated and recommendations for improvements will be made in an attempt to reduce losses.