



UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
ALAMOSA/MONTE VISTA NATIONAL WILDLIFE REFUGE
9383 El Rancho Lane
Alamosa, Colorado 81101



May 14, 1991

TO: S. Berlinger, Refuge Manager, Alamosa-Monte Vista NWR
FROM: A. Morkill, Wildlife Biologist, Alamosa-Monte Vista NWR
SUBJECT: Final report on experimental dispersal of wintering waterfowl
in the San Luis Valley, 1990-91

Monte Vista National Wildlife Refuge (NWR) is a traditional wintering area for waterfowl in the San Luis Valley (SLV) of southcentral Colorado. Prior to the 1970s, a large portion of the SLV wintering duck population roosted at natural springs and artesian wells at widely scattered locations. However, changes in irrigation methods from flooding to center pivot sprinklers have greatly effected the distribution of wintering waterfowl. Both increased sprinkler irrigation and decreased surface flow diversions from the Rio Grande River lowered the water table and many artesian wells lost flows or were capped, causing a decline in wetland habitat (Szymczak 1986). Consequently, Monte Vista NWR has become the SLV's major duck wintering area in recent decades. Natural artesian and pumped wells are used to maintain open water areas. An average of 15,100 ducks, representing 87% of the SLV's wintering population from 1982-90, have wintered on the refuge. Mallards constitute 95% of the SLV wintering population.

The SLV experiences severe winters characterized by sub-zero temperatures and snowfall; therefore wintering ducks may be stressed. Winter fat reserves of mallards captured on Monte Vista NWR from 1986-89 were lower than those of other wintering duck populations (Jeske 1991). Stressed birds are thought to be more susceptible to diseases such as avian cholera. Avian cholera was first confirmed on Monte Vista NWR in 1967, and epizootics have since occurred

annually, with projected losses ranging from 1,500 to 15,000 ducks in the last five years. Various weather factors such as cold temperatures, heavy snowfall, and wind velocity, were associated with cholera outbreaks. Several thousand ducks crowd onto limited open water areas, and high bird densities facilitate transmission of the highly contagious disease.

To minimize overcrowding and cholera epizootics of wintering waterfowl, Alamosa-Monte Vista NWR initiated an experimental effort in November 1990 to disperse waterfowl on alternative wintering sites in the SLV. The goal of the dispersal effort was to maintain healthy waterfowl populations wintering in the SLV. Wintering sites off refuge, including both wetland roosts and food sources, were provided under the Alamosa-Monte Vista NWR's Wildlife Extension Program, coordinated by Refuge Operations Specialist R. Schnaderbeck and initiated in April 1990.

STRATEGIES

Monte Vista NWR

To encourage dispersal of wintering waterfowl off Monte Vista NWR, several strategies were implemented in November 1990. All regulated artesian and pumped wells were shut off after migrants had departed and as temperatures fell below freezing. High densities of waterfowl concentrated on wetlands with historical cholera incidence were hazed off using cracker shells on five occasions before freeze-up. By late November, most wetlands were frozen except for a few scattered areas kept open by unregulated artesian flows.

Hunting was permitted as usual on one-third of the refuge during the waterfowl hunting season (approximately October 6, 1990 - January 2, 1991).

Private Lands

Off Refuge wintering areas were secured under the Refuge's Wildlife Extension Program to provide wetland roosts and food sources for dispersed waterfowl. Thirteen privately-owned wetlands provided alternative wintering areas for waterfowl (Figure 1). Winter wetland habitat included drain ditches and reservoirs which could be maintained as open water by warmwater artesian wells. Landowners were paid \$250 per wetland to restrict trespass and provide wintering wetland habitat. The average wetland size was 1.5 acres.

In addition, 14 private grainfields provided food in close proximity to winter wetland sites (Figure 1). Grainfields included hail-damaged, harvested, and standing grain. Landowners were paid an average of \$11.36/ac (range \$6-12/ac) for hail-damaged fields, based on estimated bushel/ac of shattered waste grain. Hail-damaged fields contained as much as 50 bushels/ac of shattered grain, providing an excellent and abundant food source for waterfowl. An average of \$3.17/ac (range \$2-4/ac) was paid to prevent plowing of undamaged harvested fields, based on the amount of waste grain remaining. Standing grain was purchased for an average of \$166.87/ac, based on average yield/ac and current market value, and due to the high cost only 55 acres were contracted.

Landowners were required to close both wetlands and grainfields to trespass to prevent hunters from disturbing the birds. Closure signs were provided and posted by Refuge staff. Closures were implemented in three groups based on the three duck hunting season periods to evaluate the effect disturbance has on waterfowl use patterns. Meadow Ranch, Kuntz, Bigelow Farms, Kirkpatrick, and V-Heart Ranch were closed by October 6. Crowther North and South, KW Farms, Weaver, Davis, and Skyview Cooling were closed by

November 7. Mitchell, Ziegler, Walters, Samora, Catalano, Cody, and Booth were closed by December 1 for the remainder of the waterfowl hunting season. The Rio Grande State Wildlife Area (SWA) was also closed by December 1.

Waterfowl use of both wetlands and fields was monitored on the ground from mid-October through mid-March. Aerial counts were conducted on as many as four of the 13 private wetland roosts in conjunction with the Colorado Division of Wildlife's (CDOW) winter waterfowl surveys in December and January. Information on waterfowl use was also obtained from the respective landowners.

In the event that a substantial percentage of waterfowl did not disperse off Monte Vista NWR and/or cholera losses became significant either on or off refuge, an action plan was devised to minimize the problem (Appendix A).

RESULTS

CLIMATE

Ambient temperatures in the SLV during the 1990-91 winter were below normal. The first freeze was recorded on October 3. Temperatures consistently fell below freezing in late November when most water areas became frozen for the winter. December and January were very cold months with record-breaking temperatures on several days; temperatures fell below zero on 17 days in December and remained below freezing on all but three days in January. During previous cholera outbreaks, losses were directly correlated to severe weather conditions. During the worst documented cholera outbreak in 1988-89 when a projected 15,000 ducks died, climate was considered to be normal winter weather for the SLV, with overnight lows dropping to -30 F and 2-6" of snowcover. Number of bird carcasses collected per day were usually

highest in December and January during previous outbreaks.

WATERFOWL USE OF WINTER WETLAND SITES

Numbers of ducks observed on ground and aerial counts differed between methods and through time. Due to time and logistical constraints, data are lacking for some sites while available for others (Appendix B). Large differences were evident in numbers counted on aerial surveys, ground surveys, and numbers actually thought to exist in the SLV (Appendix C). For example, while only 2,017 geese were counted on the January 11 SLV Winter Waterfowl Survey, the winter geese population probably exceeded 10,000 based on cursory observations. Data presented here represent estimated minimum and maximum waterfowl numbers observed on winter wetland and grainfield sites.

Monte Vista NWR

An estimated 6,000-8,000 ducks remained on Monte Vista NWR through the 1990-91 winter, representing 48% of the SLV's wintering population (Appendix C). These ducks concentrated near unregulated artesian wells and often moved between areas both on and adjacent to Monte Vista NWR (Figure 2).

Early spring migrants, particularly Northern pintail and green-winged teal, arrived on Monte Vista NWR in mid-February. Regulated artesian wells (no's 7, 8, 58, 59, 60, 63) were subsequently opened up to create wetland habitat for migrant waterfowl and cranes.

Private Lands

Fall (October-November) --

Privately-owned grainfields acquired under the Wildlife Extension Program provided an important food source for migrating waterfowl and cranes during the fall migration period. Birds utilized eight of the 14 acquired grainfields for feeding during fall migration, including Meadow Ranch, Bigelow

Farms, Kirkpatrick, Crowther North and South, KW Farms, Ziegler, and Catalano. Sandhill cranes also used meadows on Mitchell, Samora, and Cody extension areas for loafing habitat. Whooping cranes were observed feeding in grainfields on Meadow Ranch and Crowther North on several occasions. No birds were observed on Skyview Cooling grainfield. This particular site was secured due to its proximity to Flucky Springs, which traditionally wintered a substantial number of ducks; however, the springs were dry in 1990-91.

Waterfowl use of wetland sites was sporadic during fall migration, perhaps due to available wetland habitat before freeze-up and hunting activities in the SLV. Small numbers of waterfowl were observed in drain ditches on Crowther South, Davis, Cody, Weaver, and Meadow Ranch, and in reservoirs on Bigelow Farms, Kirkpatrick, Mitchell, and V-Heart Ranch.

Winter (December-January) —

In early December, wintering populations established use patterns at four of 14 grainfield sites. The Kuntz grainfield was used heavily throughout the winter by as many as 7,000 ducks and 1,500 geese wintering on nearby extension wetlands. As many as 300 mallards and 3,000 geese were observed on the Booth grainfield, and 2,500 ducks and 1,500 geese on Crowther South grainfield. The Crowther North grainfield received some use by as many as 130 geese. The Bigelow grainfield was not used extensively by wintering waterfowl, possibly because migrant waterfowl and cranes had consumed as much as 75% of the grain during fall and birds consistently fed at the nearby Kuntz grainfield. No birds were observed on the Kirkpatrick grainfields, despite use of a nearby wetland site. Efforts to attract ducks to this field in January by mowing the stubble shorter and placing decoys were unsuccessful, perhaps because waterfowl in the area had already established feeding patterns

elsewhere. No birds were observed on the Ziegler, Catalano, or Skyview Cooling grainfields through the winter. Lack of bird use on Catalano was most likely related to hunting activities; while large numbers of waterfowl used this field in early fall, none were observed after hunting season opened nor after the site was closed to trespass during the third duck season, possibly because wintering waterfowl had already established use patterns to other fields, such as Monte Vista NWR.

Seven of the 13 acquired wetland sites were utilized during winter. The proximity of wetlands to food sources and hunting activities likely determined whether or not sites were used by wintering waterfowl. The west Bigelow and Kuntz reservoirs held as many as 7,000 ducks and 500 geese throughout the winter months. Numbers fluctuated between the Kuntz and west Bigelow reservoirs as the birds shifted their distribution either on one or the other, or distributed between the two. Duck flights were also observed between these reservoirs and Kerr Pond. The Kirkpatrick reservoir was used sporadically by 100-1,500 ducks during winter. As many as 2,000 ducks and 50 geese used the Walters reservoir adjacent to Monte Vista NWR; these ducks often moved back and forth from the refuge.

Waterfowl use of drain ditches was lower than expected. Based on personal accounts of local residents, several hundred ducks were common in the larger drain ditches in past winters. However, only a few hundred ducks at most were observed on Crowther South, Davis, and Cody. The east Bigelow reservoir, reservoirs monitored on Mitchell and V-Heart Ranch, and Weaver drain ditches were unexpectedly frozen most of the winter and waterfowl use was minimal.

Other waterfowl wintering wetland sites included in the overall

dispersal program were Kerr Pond, Rio Grande SWA, McIntyre Springs and adjacent Conejos River, and Alamosa NWR (Figure 1). Kerr Pond traditionally winters 2,000-4,000 geese, and included as many as 3,000 ducks this winter, which were believed to be part of the population wintering on Kuntz and Bigelow. Counts on the Rio Grande SWA indicated that 1,200-2,000 ducks roosted on open water provided by a large artesian well after the area was closed to waterfowl hunting in December (T. Rauch, pers. comm.). McIntyre Springs and the adjacent Conejos River, neither of which were under an extension agreement, wintered only about 175 geese and 155 ducks. In past years, McIntyre Springs wintered a majority of SLV ducks, second only to Monte Vista NWR. An estimated 300 ducks wintered at the Mumm Well on Alamosa NWR, and 450 geese wintered along the Rio Grande River within the refuge boundary.

Spring (February-March) --

Numbers of early migrants increased on wetland sites in mid-February. Sandhill cranes and geese once again used most of the grainfield sites, including Booth, Crowther North and South, Catalano, Kuntz, Bigelow, Kirkpatrick, KW Farms, Samora, and Meadow Ranch. One whooping crane was observed feeding in the Bigelow and Kuntz grainfields (R. Drewein, pers. comm.). Another whooping crane was observed loafing along La Jara Creek near the Booth grainfield.

EVALUATION

AVIAN CHOLERA

To evaluate the effect of dispersal on wintering waterfowl, avian cholera incidence was monitored. Water areas on Monte Vista NWR where wintering waterfowl concentrated were checked frequently for sick or dead

waterfowl. The first case of cholera was confirmed by Madison Health Lab in two mallard carcasses picked up on November 27. Throughout the winter months, only 60 carcasses (50 scavenged, 10 fresh) were discovered on Monte Vista NWR, despite intensive searches. Most carcasses were found at waterfowl concentration areas (Figure 2). Given an average scavenger removal rate of 70% (1988-89 and 1989-90 field trials), total number of ducks lost to cholera in 1990-91 was projected to 260 ducks, representing 3.7% of the average 7,000 ducks wintering on Monte Vista NWR. No geese carcasses were found on the refuge.

Private land winter wetland sites with high waterfowl densities at Kuntz, Bigelow and Walters reservoirs were also checked for cholera-infected birds. Thirteen ducks and three geese carcasses were recovered, and cholera was confirmed by Madison Health Lab in two mallards. Again assuming an average scavenger removal rate of 70%, the total number of birds lost to cholera was 66, representing approximately 1% of the population wintering on those reservoirs.

Bald eagles play an important role as scavengers of cholera-infected birds, and in effect help control disease transmission from dead to live birds in a wetland. Eagle use of Monte Vista NWR and other winter wetland sites was noted. Eighteen eagles were counted on Monte Vista NWR during the Mid-winter Bald Eagle Survey conducted January 11th, compared to an average of 38 eagles counted from 1985-90. However, 41 bald eagles were counted on the Rio Grande River in the SLV, compared to only 0-5 eagles from 1985-89 (Colo. Div. Wildlife, unpubl. report). Also, eagles were frequently observed near waterfowl concentrations on Monte Vista NWR, and Walters, Kuntz and Bigelow extension areas. The above indicate that eagles, as well as waterfowl,

dispersed throughout the SLV.

TRAPPING

To evaluate the effect of dispersal on the physiological condition of wintering waterfowl, we attempted to trap mallards on Monte Vista NWR and private land in February. Body weight and wing length were measured and used to determine a condition index for each bird (estimated body fat/estimated fat-free body mass, Ringelman and Szymczak 1985). Condition indices were compared to similar data obtained on Monte Vista NWR in 1986-89 (Jeske 1991).

A cannon net was borrowed from Bosque del Apache NWR; wing boards and weight scale were borrowed from the Colorado Division of Wildlife. Trap sites were baited several days in advance with surplus barley and corn. A trap site on Monte Vista NWR was unavailable; therefore we selected a site on Walters reservoir where wintering birds mixed with the refuge population. Trapping attempts were unsuccessful at the Bigelow reservoir and Kuntz grainfield, and no other private land sites were feasible. Trapping efforts were discontinued in mid-February due to the arrival of migrants.

Bait was placed at the Walters site four days before scheduled trapping. The first trapping attempt on February 5 was unsuccessful due to poor firing of the cannon net. The second attempt was successful on February 6, and 47 mallards (20 males, 27 females) were captured. Crops were examined to determine extent of feeding on bait, but no significant weight effects were noted. Mean body weight of males (age unknown) was 1108g (1025-1223g) and mean wing length was 295mm. Mean body weight of females (age unknown) was 942g (773-1122g) and mean wing length was 274mm. In comparison, overall mean body weight for adult male and female mallards trapped in 1986-89 were 1054g and 931g, respectively (Jeske 1991). Mean condition indices for males were

16.47 (10.02-21.65) and for females 16.06 (5.21-23.23). In comparison, mean condition indices for adult male and female mallards trapped in 1986-89 were 13.5 and 14.4, respectively (Jeske 1991).

Although the data were considered inconclusive because of small sample size and large variation, mallards captured in 1991 had higher mean body weights and would have been categorized as "good" condition on the average compared to those captured in 1986-89, based on Jeske's (1991) criteria.

CONCLUSIONS & RECOMMENDATIONS

1. As a result of experimental dispersal efforts initiated in November 1990, 48% of the SLV's wintering mallard population remained on Monte Vista NWR in 1990-91, compared to 87% in previous winters. The Refuge's wintering mallard population remained stable throughout December and January, and these birds concentrated on unregulated artesian wells. In the future, once wintering birds become established at dispersed wetland sites in the SLV in late December, a few artesian flows on Monte Vista NWR should be turned on to create and rotate open water areas and further reduce overcrowding of those birds remaining on the refuge. Alamosa NWR could also potentially winter a substantial number of waterfowl if the Mumm Well were approved to run during winter months.

2. Cholera losses were significantly lower in 1990-91 on Monte Vista NWR than in previous years, despite below-normal temperatures in December and January. Such results suggest that the wintering waterfowl were less stressed and overcrowded as result of dispersal.

3. According to Jeske (1991), the susceptibility to cholera was apparently unrelated to body condition of wintering mallards on Monte Vista

NWR. However, improved winter body condition may influence reproductive success of resident mallards. Trapping efforts to capture wintering mallards and estimate body condition should be intensified in the future to further monitor the potential effects of dispersal. A minimum of 40 birds in each sex and age class (adult and first-year males and females) for each trap site was recommended by Ringelman and Szymczak (1985).

4. Number of wintering bald eagles was lower on Monte Vista NWR in January 1991 as a result of dispersed and healthy waterfowl, which the eagles previously had fed on extensively. However, bald eagles were located at other waterfowl concentration areas in the SLV. The overall wintering bald eagle population of 94 eagles in the SLV remained similar to previous years (1985-90 average=68, range 51-111). A Section 7 Evaluation should be completed evaluating the effect on wintering bald eagles caused by minimizing waterfowl cholera losses and smaller wintering waterfowl concentrations on Monte Vista NWR.

5. Several wetland and grainfield sites obtained under the Wildlife Extension Program provided alternative wintering sites that attracted and held substantial numbers of waterfowl, particularly Bigelow, Kuntz, and Walters. These sites consisted of small reservoirs less than 10 ac in size and were located in close proximity to fields with an abundance of grain for feed. At Bigelow, Kuntz and Kerr Pond, the birds frequently moved between reservoirs; and similarly, birds at Walters frequently moved to and from Monte Vista NWR. The birds were therefore able to find alternative areas for security if disturbed. Conversely, grainfields located at greater distances from wetland roosts received minimal use by wintering ducks. Grainfields in close proximity to two or more wetland sites should be secured in the future to

duplicate the Bigelow-Kuntz and Monte Vista NWR-Walters scenarios. If several private winter wetland areas are available in close proximity, wetlands closed to trespass should perhaps be rotated year to year to move waterfowl concentrations among reservoirs and minimize cholera incidence.

6. The drain ditches did not winter substantial concentrations of waterfowl in 1990-91 as expected. Hunting closures on Crowther South, Cody and Davis may have been too late to allow birds to establish and maintain use patterns for the winter. However, one year of monitoring is not sufficient to assess the importance of drain ditches as winter wetland roosts, and efforts should continue to secure such sites for evaluation in 1991-92.

7. Several fields with abundant grain were not utilized by wintering waterfowl. Waterfowl tend to establish rigid flight patterns to particular feeding areas; and if a field is undetected early on and other food sources are available, it is likely that certain fields may not be utilized. Disturbance by hunters on fields such as Catalano caused the waterfowl to abandon use of the field in early fall. In another example, a second unplowed grainfield owned by Kuntz was not closed to trespass; and subsequently, this field received no bird use as a result of disturbance (J. Kuntz, pers. comm.). Bigelow and Kuntz sites closed for the entire waterfowl hunting season were utilized heavily by waterfowl. Efforts should be made in the future to close wetland and grainfield sites to all trespass as early as possible to encourage wintering waterfowl to establish use patterns. It should be noted that many fields not used by wintering ducks did provide important feeding sites for cranes and geese during fall and spring migration.

8. The entire dispersal program will again be considered experimental in 1991-92. Following two years of monitoring and evaluation, a set of

criteria should be developed to provide for healthy wintering waterfowl populations in the SLV.

LITERATURE CITED

- Jeske, C. W. 1991. Condition, survival, and management of mallards wintering in the San Luis Valley, Colorado. Ph. D. Dissertation, Colo. State Univ., Fort Collins. 150pp.
- Ringelman, J. K., and M. R. Szymczak. 1985. A physiological condition index for wintering mallards. *J. Wildl. Manage.* 49(3):564-568.
- Szymczak, M. R. 1986. Characteristics of duck populations in the intermountain parks of Colorado. *Colo. Div. Wildl. Tech. Publ.* No. 35.

Figure 1. Location of NWRs and Wildlife Extension areas, SLV, Colorado.

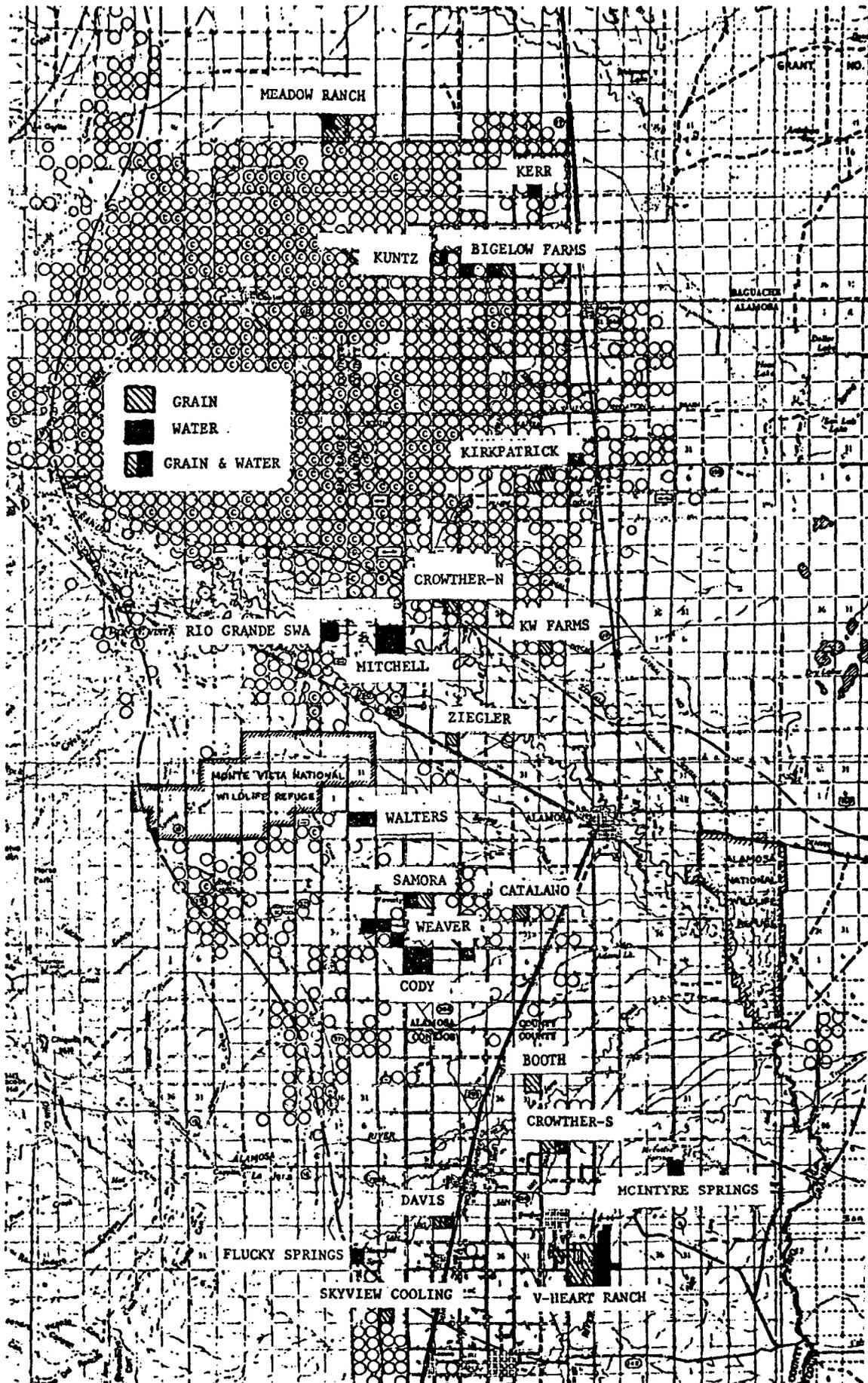
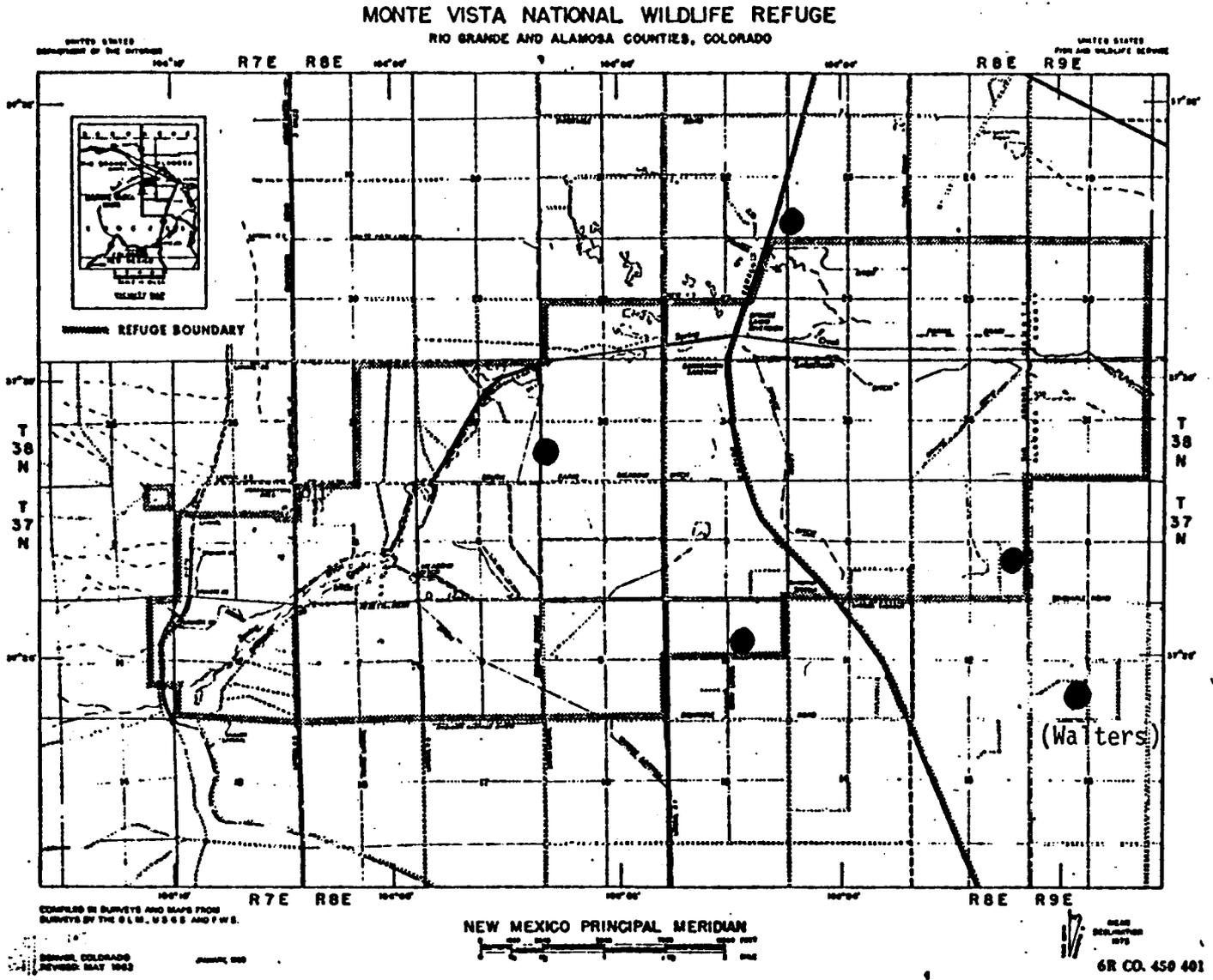


Figure 2. Waterfowl wintering areas located on or adjacent to Monte Vista NWR, 1990-91.



● Roost locations

APPENDIX A

Action Plan for Winter Waterfowl Dispersal Effort

SUBJECT: Action Plan in Addition to 8/17/90 Memo on Winter Dispersal Effort

As per the strategies outlined in our 8/17/90 memo (attached):

- Strategy #1 - ~~19~~ sites in the San Luis Valley (SLV) contain feed and/or water under Wildlife Extension Agreement Contracts
- Strategy #2 - Artesian wells No's 7, 8, 58, 59, 60, and 63 on the Monte Vista NWR will be closed off by early November. Small artesian wells that may begin flowing will be allowed to flow.
- Strategy #3 - The Monte Vista NWR is open to hunting. Waterfowl season closes 1/2/91.
- Strategy #4 - 5 Private Land (PL) sites were closed to all trespass by October 6, 8 PL sites will be closed to trespass by November 7, and 6 PL sites will be closed to trespass by December 1.

Shortly after the 1st hard natural freeze has occurred, i.e. Alamosa NWR is froze up, the following actions will be initiated dependent on waterfowl population sizes, significance of death loss, and health of the birds.

Significant death loss has occurred when 30% of a population entity has died. Birds are still considered healthy so long as death loss is not significant.

SCENARIO A.

30% or less of the SLV waterfowl population are wintering ON THE REFUGE.

1. NO significant loss; continue monitoring.
2. YES significant loss:
 - a. If PL's are healthy; then do not disperse unhealthy refuge birds to PL's, but start sanitation efforts.
 - b. If PL's are unhealthy; then rotate refuge water areas and start sanitation.

SCENARIO B.

70% or more of the SLV waterfowl population are wintering ON THE REFUGE.

1. NO significant loss:
 - a. If PL's are healthy; then continue efforts to disperse birds to PL's.
 - b. If PL's unhealthy; then monitor and implement sanitation efforts.
2. YES significant loss; then rotate refuge water areas and start sanitation.

SCENARIO C.

30% or less of SLV waterfowl population is wintering on PRIVATE LANDS.

1. NO significant loss; continue monitoring.
2. YES significant loss:
 - a. If refuge and/or some PL's are healthy; then do not disperse unhealthy birds to healthy sites.
 - b. If refuge and PL's are both unhealthy; start sanitation efforts on unhealthy areas.

SCENARIO D.

70% or more of SLV waterfowl population is wintering on PRIVATE LANDS.

1. NO significant death loss; continue monitoring.
2. YES significant death loss:
 - a. If refuge and/or some PL's are healthy, then do not disperse unhealthy birds to healthy sites but start sanitation efforts.
 - b. If refuge and PL's are both unhealthy; create open water areas on the refuge and start sanitation efforts but do not force dispersal to anywhere.

All of the above are aimed at trying to keep healthy birds on healthy sites as well as not contaminating healthy sites with unhealthy birds.

DATE PREPARED: 10/30/90



UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
ALAMOSA/MONTE VISTA NATIONAL WILDLIFE REFUGE
9383 El Rancho Lane
Alamosa, Colorado 81101



Handout for Waterbird Meeting - August 21, 1990

Subject: Winter dispersal of waterfowl from Monte Vista NWR to various sites within the San Luis valley.

Goal: Maintain healthy waterfowl populations wintering in the San Luis valley.

Strategy: Disperse wintering waterfowl throughout available habitat in the valley to lower concentrations of birds on Monté Vista NWR; thereby minimizing losses of birds to avian cholera outbreaks.

1. Initiate Wildlife Extension Program on private lands to obtain feed and water.
2. Manipulate open water availability on the refuge, and at selected state and private lands.
3. Allow hunting on the refuge to discourage waterfowl use.
4. Close late season hunting on selected state and private lands to encourage waterfowl use.

Monitoring & Evaluation:

1. Conduct biweekly ground surveys and monthly aerial surveys to enumerate waterfowl dispersed throughout the valley by censusing and photography.
2. Monitor all sites weekly for avian cholera outbreaks.
3. Trap waterfowl in February to determine body condition (140 birds).
4. Encourage waterfowl to return to the refuge about March 1 by providing feed and water.

(Date prepared 8/17/90)

APPENDIX B

Winter Waterfowl Use of Private Wetland and Grainfield Sites

<u>SITE</u>	<u>WEEK 1*</u>	<u>WEEK 2</u>	<u>WEEK 4</u>	<u>WEEK 5</u>	<u>WEEK 6</u>	<u>WEEK 8</u>	<u>WEEK 9</u> (9)	<u>WEEK 10</u> (20)
Booth								
Crowther South	**			100, <u>50</u>			15	
Davis				<u>150</u> (10)		0	<u>300</u>	
Skyview Cooling					0	0	0	
V-Heart Ranch						<u>100</u>		<u>0</u>
Cody		<u>0</u>					<u>75</u>	
Catalano		(200)			0	0	0	
Samora					0	0	0	17 (70)
Weaver			<u>10</u>	<u>50</u>			<u>55</u>	<u>0</u>
Mitchell			<u>250</u>					<u>0</u>
Walters								<u>0</u>
Ziegler								
Kirkpatrick	0, <u>25</u>		0		0, <u>0</u>		<u>75</u>	<u>0</u>
KW Farms			(150)				0	0
Bigelow Farms	<u>50</u>		300, <u>50</u> (2400)	500, <u>70</u> (750)		<u>500</u>	<u>7000</u>	<u>3500</u> (400)
Kuntz			0, <u>0</u>	0, <u>0</u>			<u>2500</u> (1500)	<u>0</u>
Meadow Ranch	(200)		450 (500)	(550)			0, <u>30</u>	
Crowther North (continued)				(10)				

SITE	WEEK 11	WEEK 13	WEEK 14	WEEK 15	WEEK 16	WEEK 18	WEEK 21	WEEK 24
Booth			(10)	(450)		(3000)		(100)
Crowther South			(350)	100 (200)	2500 (1500)			
Davis	<u>0</u>							
Skyview Cooling	0							
V-Heart Ranch			<u>0</u>					
Cody		10 (700)	10, <u>20</u>		<u>20</u>			
Catalano		0				0		
Samora		0				0		0
Weaver		<u>0</u>				<u>0</u>		
Mitchell		<u>0</u>						
Walters				<u>1000</u> (20)	<u>2000</u> (45)			
Ziegler								
Kirkpatrick			0, <u>1500</u>	<u>25</u>	<u>350, 0</u>			
KW Farms			0		0			
Bigelow Farms			0, <u>2500</u>		0, <u>4300</u>			
Kuntz			<u>3000</u> (1500)		2600 (1200)			
Meadow Ranch								
Crowther North		(130)	(75)				(20)	

= ducks in field, # = ducks on wetland, (#) = geese
 * Weeks begin Oct. 7, 1990 ** Blank cell indicates no survey taken

APPENDIX C

San Luis Valley Winter Waterfowl Survey Results
(Colorado Division of Wildlife)

STATE OF COLORADO
DIVISION OF WILDLIFE
 DEPARTMENT OF NATURAL RESOURCES

DATE: December 17, 1990

TO: Jim Olterman

FROM: Bev. Motz

RE: Mid- December SLV Waterfowl Count

We flew the SLV waterfowl count on Dec. 10, 1990. The total flight time was 5.5 hours. Skies were clear, the temperature was about 35, and no snow cover.

<u>Area</u>	<u>Geese</u>	<u>Ducks</u>
Russel Lakes (frozen)	0	0
Wetherill Track	0	0
Fields N. of Hooper	3,200	1,700
* Bigelow Pond (USFWS lease) (open)	150	2,750
Head Lake (mstly frozen)	0	20
San Luis Lake (frozen)	0	0
* Kuntz Pond (USFWS lease) (partly frozen)	0	0
BLM Ponds (mostly frozen)	125	0
Smith Reservoir (mostly frozen)	550	1,200
Adams (frozen)	0	0
Sanchez Reservoir (frozen)	0	0
Monte Vista Refuge	0	8,000
Alamosa Refuge (mostly frozen)	480	5
Culebra Creek (mostly open)	0	210
Rock Creek Reservoir (mostly open)	20	100
Conejos and McIntyre Springs (mostly open)	930	690
Rio Grande: Stateline to La Sauces	0	0
La Sauces to Alamosa Refuge	200	20
Alamosa to County Line	120	0
County Line to Del Norte	130	230
Del Norte to South Fork	40	0
Totals	5,945	14,925

cc: Towry Rauch
 Donoho Wright
 Wetherill USFWS MV
 Weldon BLM Alamosa

* USFWS Wildlife Extension Areas
 (two of 13 wetland areas)

STATE OF COLORADO
 Roy Romer, Governor
 DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WILDLIFE

AN EQUAL OPPORTUNITY EMPLOYER
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1/11/91 C-2 5B

When you refer to the R.C. would be nice to include some of your counts on Ext. Area plus put a comparison as to last years mid-winter i.e. 1990 in 89 vs X's in 1990, etc. Thanks,
 January 15, 1991

REFER TO Rick
 For Wildlife-
 For People



TO: Jim Olterman

From: Barb Poole

RE: Mid-Winter SLV Waterfowl Count

Ann - might include your ground counts of several areas to better document use of our areas in 3000+ acres, Davis, Kirkpatrick, Colby, King, Singler, McInyre, etc.

We flew the SLV Waterfowl Count on January 11, 1991. Total flight time was four hours. Skies in the valley were clear and the ground was snow covered. Ann Morkill, USFWS, was along as an observer. We counted nine bald eagles during the flight.

Area	Geese	Ducks
Russell Lakes (mostly frozen)	0	13
Wetherill Tract	0	3
Ponds NW of Hopper (20% open)	25	500
** Kerr Pond (USFWS lease) (20% open)	0	20
Pond S of Kerr Pond (open)	0	20
** Bigelow Ponds (USFWS lease) (30% open)	0	2503
** Kuntz Ponds and Fields (USFWS lease) (open)	462	0
San Luis Lake (frozen)	0	0
Head Lake (frozen)	0	0
BLM Ponds (mostly frozen)	25	0
** Kirkpatrick Prop. (USFWS lease)	0	10
Smith Reservoir (frozen)	0	0
Adams Lake (frozen)	0	0
Sanchez Reservoir (frozen)	0	0
Culebra Creek (open)	50	59
Stabilization Reservoir (frozen)	0	0
Conejos R. and McIntyre Springs (frozen above McIntyre)	175	155
Flucky Springs (dry/frozen)	0	0
Rio Grande River:		
Alamosa to State line (frozen)	0	3
Del Norte to Alamosa (mostly frozen)	430	60
Monte Vista Wildlife Refuge*	400	6500
Getz Property (artesian well)*	0	3500
Alamosa Wildlife Refuge*	450	300
Totals	2017	13,646

*These areas counted from the ground by Refuge personnel.
 ** USFWS Wildlife Extension Areas - four of 13 wetland areas

- cc: Towry
 Donoho
 Wetherill
 Weldon
 Rauch
 Wright
 Wait
 Funk
 Alamosa NWR ✓
 BLM-Alamosa