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United States Department of the Interior

BUREAU OF LAND MANAGEMENT

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Room 3008 Federal Building
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To: District Managers, Nevada
From: State Director, Nevada
Subject: Analysis of Capture Data by Ron Hall

I have enclosed a copy of an analysis of data collected during wild horse round-ups in the Winnemucca District. This analysis was compiled by Ron Hall just prior to leaving the Bureau.

I believe we are extremely fortunate that Ron made this contribution. The analysis contains a great amount of information that any employee working with wild horses can use and I would urge such employees to study this short document in detail.

1 Enclosure
Encl. 1 - Analysis of Data Collected
During Wild Horse Round-ups
in the Winnemucca District

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An Analysis of Data Collected During
Wild Horse Round-Ups In The
Winnemucca District-Nevada

By

Ron Hall

Seventeen hundred and fifty-two (1752) wild horses were gathered in three separate areas during the period July 77 - Jan. 78. These animals were gathered utilizing a Bell-47G3B1 and portable panels. Seventeen hundred and twenty-four (1724) were shipped to Palomino Valley Holding Facility and twenty-eight (28) horses were disposed of at the various trap sites.

The gatherings were conducted on the East Range (7-8-77/8-30-77), Owyhee Desert (8-31-77/11-4-77) and the Hot Springs Mountain (11-28-77/1-13-78). The areas could be briefly catergorized as follows:

East Range

A relatively typical Great Basin Mountain Range with a north south orientation. The mountain extends 45 miles and is three miles wide at its narrowest point and 20 miles wide at its widest point. Open sagebrush slopes are dominate with interspersed juniper. In local sites, north or east facing, juniper sometimes occurs in dense stands. The mountain is disected with drainages that generally run east and west.

Owyhee Desert

The Owyhee Desert is an extension of the Snake River plain and is dominated with vast open sagebrush flats that are disected with shallow drainages. Elevations are generally around 5500' - 5600' MSL.

Hot Springs Mountain

The Hot Springs Mountain extends 21 miles in a north south orientation and is five (5) miles wide at its widest point. The slopes are steep to moderately steep and are dominated by sagebrush.

Winnemucca Horse Gatherings

Data Element

Location	No. Horses Gathered	Est. No. Present	No. Traps Utilized
East Range	296	1100	7
Owyhee Desert	1065	1800	1
Hot Springs Mountain	391	420	2

Data Element

Location	Helicopter Hrs. Flown	No. Days Flown	Avg. Hrs. Flown/Day	Avg. Hrs. Per Horse	MM Expended	Period of Operation
East Range	145.8	27	5.4	.49	25	(7-8-77) (8-30-77)
Owyhee Desert	295.6	54	5.47	.277	25.9	(8-31-77) (11-4-77)
Hot Spgs. Mountain	123.2	22	5.60	.31	6.7	(11-28-77) (1-13-78)

In analyzing the data one can draw the conclusion that as we gained experience we became much more efficient in the art of gathering wild horses. This is a fact, however, other factors which are not quite so obvious also had an influence on our efficiency.

During July and August the temperature was quite hot most of the time. Temperature affected two aspects of the operation; namely aircraft performance and wild horse performance. Aircraft performance was affected to the extent that many times the maneuvers critical to corralling wild horses could not be executed. Flying in the canyons and moving horses became extremely hazardous so safety precautions had to be practiced vigorously. Much of the time we had to stay well above the horses, as such, we could not effectively turn them when necessary. In a situation like this, when you allow horses to turn under the aircraft or turn in a direction you did not wish them to go, the horses soon learn not to fear the aircraft. When this happens you will not corral that particular band of horses. With each particular band, depending upon their individual temperament, you only have so many directional changes or maneuvers you can execute. If these are used up in ineffectual or incorrect directional changes, you may arrive at the corral out of control, and this is the point where pressure must really be exerted on the horses. An overeager pilot may want to make minor directional changes enroute to the corral, this must be avoided. As long as the horses are generally headed in the correct direction they should be left alone and allowed to pick their own rate of travel. I have occasionally had pilots become irritated at a particular band of horses and place their machine within a few feet of wild horses attempting to turn them. In this situation experience is the best teacher - the horses will not turn. In one case we were so close that a horse kicked the undercarriage of the helicopter, needless to say the pilot did not try that maneuver again.

Temperature has a tremendous influence on wild horses performance. In cool weather the horse just naturally feels better. They will travel farther and handle better. You have many more turns in a band of horses in cold weather before they leave you and the machine does not have to work as hard - nor does the horse.

During May, June, July and August colts will be lost irregardless of the experience of the round-up crew. I have observed colts that become disoriented and separated from the band in 200 yards. If the horses are headed down steep ridges when this happens you can forget trying to turn them around so the colt can rejoin the group. In some situations the horses can be turned back and left alone and the mare may find the colt. In many situations, the colt is lost and left to a very harsh fate. These colts, of course, never become a part of the data and the incident is known only to the pilot and round-up director. It is my opinion that helicopter gathering operations should not be conducted in this latitude during the period of March through September 15.

*Starting
them
fast!*

The temperament and experiences of the horse and the type of country are other variables that affect the efficiency of a gathering operation. If one were to rank the gatherings we were involved in from the toughest to the easiest they would be ranked as follows:

1. East Range
2. Hot Springs Mountain
3. Owyhee Desert

The East Range is located 10 air miles south and west of Winnemucca. These horses have been and are still being chased by local cowboys for sport and profit. They have had many experiences in being hazed toward traps and as such are very difficult to handle. Some of the horses, even when first picked up, had little respect for the helicopter. If a horse does not fear the machine you will not capture him.

In addition, the East Range is a large piece of country that cannot be worked into a couple of traps. The number of fences also presented problems. Occasionally, a fence may be an advantage, but most of the time they are detrimental to a round-up operation. If I had a choice of working in an area with no fences versus an area with numerous fences I would choose the unfenced area every time. It is possible to move horses through fences by tearing down the fence in a corner or other advantageous location and placing rope wings out to direct the horses through the fence. It is also possible to locate traps along fences at good sites. However, the fact must be accepted that if you are working along fences or through fences you will occasionally put an animal or animals through the fence.

Pilot experience is a factor in the efficiency of an operation. Most pilots new to gathering horses tend to overfly the horses - work harder than necessary. If a pilot understands the capability, attitudes and probable behavior of wild horses they are of great advantage. They can anticipate the actions of a band of horses and if necessary correct a situation before it becomes serious. Sometimes an instantaneous reaction on the pilots part is necessary. If you must take the time to tell the pilot what to do and then add on his reaction time it is often too late.

Trap location and design are 95% of the game of capturing wild horses. With a poor trap you can take the best pilot and machine in the world and be unsuccessful in gathering horses. Conversely, take an excellent trap and the poorest pilot in the world and you will be quite successful in gathering wild horses - if the pilot keeps the machine in the air!

The pilot we had during the first two round-ups was inexperienced in chasing wild horses when we first began. In fact, it took him better than a month to begin to feel comfortable while chasing horses. Add to that an inexperience crew, hot weather, tough country and stubborn horses and you have a disaster.

We changed pilots prior to gathering on the Hot Springs Mountain. Again, we had an inexperienced pilot which created problems. However, we had other factors working to our advantage. We located two excellent traps and camouflaged them well, we had a small but experienced crew, the weather was cool and the entire mountain could be worked into two traps. We had a successful round-up operation and gathered 391 horses out of a possible 420 wild horses. I feel we could have captured a few more of the 29 left but we were shut down by the State Office.

Experienced pilots and experienced crews are important to, but not vital to, a round-up. Cool weather and an excellent trap are vital.

There are many factors that must be considered when designing and locating a new trap. Here are just a few:

1. The horse must have some desire to go to the trap location.
2. The terrain and/or cover must be such that the trap can be completely concealed.
3. The horse should not be able to see anything until he is well into the wings of the trap - by that time a couple of cowboys should be behind them.
4. When the horses are well into the wings of the trap they must not be able to see the end of the trap, they must think "THEY ARE GETTING AWAY." This can be accomplished by bending the trap around a cut bank, heavy vegetation, up a drainage or over and around the point of a hill. This is a very important point!! There are no cowboys or helicopters that will stop horses from running over them if they turn back at this point.
5. Can you see the trap from ground level? If you can, then so can the horses.
6. Is there a well used horse trail into the wings and corral itself? If not, you had better make one.
7. You will probably be running the trap primarily during the early morning hours. If successful you will be trucking in the afternoons. If possible, things will work better if you can run the horses east into the morning sun so the sun will reduce their ability to see. A trap which is operated into the west will operate better in late afternoon. Some traps operate best on overcast winter days, on other traps time of day makes little difference, only experience will tell.

8. Where possible it is good to have the trap located so you are running horses with the prevailing wind the last distance into the trap. This is not good for the helicopter as it is flying downwind during the period of time when drastic maneuvers are sometimes necessary. In some locations the wind is so variable it cannot be considered.
9. How much country will the proposed trap serve? The ideal is when one trap will serve an entire mountain or herd area. In general, horses on mountains must be brought to the flats and either caught there or caught as they are returning to the mountain. Take the time to build the trap right the first time, rather than having to halt the round-up for minor modifications.

You will probably never see two horse traps that are exactly alike. However, basic designs can be modified to fit the terrain and situation. The most important factor of all is "KNOW YOUR HORSES". Know which direction they like to run. In some situations they will want to run off the mountain onto the flat, other situations are the reverse. Seldom will they want to travel down drainages, preferring to travel down ridges. Never build a horse trap without first moving horses through the trap site. Move horses all over the herd area and do a little experimenting prior to trap construction. You will find it money well spent!

Additional Data

Color Types
Winnemucca Horse Gathering

Data Element
Percent

Location	Appaloosa	Bay	Black	Brown	Buckskin	Chesnut	Gray	Palomino	Pinto	Roan	Sorrel
Wyhee	.1%	26.5	11.2	7.8	1.1	5.7	22	.3%	.8%	13.2	11.3
Range	0	34.6	13	14.7	3	2.7	2	0	.3%	20.5	8.9
Hot Springs	1.3	25.8	13.3	12.3	1.3	2	12.3	3.7	.5%	6	21.4

Color types may be interesting only from the standpoint of historical data. However, it is a record that should be preserved. These data may be at some point in time become useful in the selective management of the herd. (Note - color typing is confusing to many individuals. The data presented was collected with extreme care and by one individual).

Winnemucca Horse Gathering

Data Element

Location	Sex Ratio and Colts/100 Adults						Colts per 100 Adults
	Sex Ratio Total %		Sex Ratio Colts %		Sex Ratio Adults %		
	♂	♀	♂	♀	♂	♀	
East Range	35	65	57	43	34	66	21
Owyhee Desert	44	56	50	50	42	58	20
Hot Springs	44	56	52	48	43	57	27
All Areas	42	58	51	49	41	59	22

In analyzing this data it is apparent that a significant difference exists between the number of males present in the sample and the number of females present. The sample in total favors the female by 16%. The sex ratio of the adults favors the female by 18%. It is also apparent that with the exception of the East Range a significant difference does not exist in the sex ratio of the colt sample. The East Range was a fairly small sample (total 51 colts) and if one lumps the data with the other areas the colt sex ratio is 49% ♀ and 51% ♂.

Several hypothesis are available to explain this situation.

1. This years colt crop is not representative of past years in terms of sex ratio. Therefore, the sex ratio of the adults (41% ♀ and 59% ♂) represents a situation in which past years reproduction strongly favored the female.
2. This year colt crop (49% ♀ and 51% ♂) is representative of what one could expect in a fairly large sample of wild horses located anywhere. Therefore, there is a differential mortality rate which depresses the population. (viz - more males die than females).

3. The sample collected during the helicopter gathering of wild horses is not truly a random sample. Selective factors were at work which favored catching more females and less males. In other words the data collected in the sample is not truly representative of the population.

Statistically there is no reason why this years colt crop would be any different, in terms of sex ratio, than any other year. Also, statistically one can expect a sex ratio at birth of 50-50 if a large sample is taken.

Additionally, I can see no reason why mortality is greater in the males than in the females. In fact, I would expect exactly the opposite to be true. The female must go through the rigors of reproduction and lactation. One could surmise that the males are in competition for females therefore there is more physical activity, fighting, and many of the males die in this effort. In ten years of observing and working with wild horses I have documented one death that resulted from stallions fighting. In view of this, the difference in sex ratio cannot be explained through this means.

I do not think there are any pathogens, bacteria or viral, that are selective and effective enough to explain the sex ratio difference. If there is research available to the contrary I am not aware of it.

If the above logic is correct the hypothesis that must be correct is that there are selective factors working during gatherings and the sample is not truly representative of the population.

When gathering wild horses I made no conscious effort to capture more females than males, we were just catching horses and felt the sample was random. It was not!

When gathering horses one naturally selects the larger bands. If there are two groups of horses, a group of 9 and a group of 3 on a ridge, which group would you select? (Note - when gathering horses it is not wise to try and mix several bands and take them to the corral. You will quite likely end up with zero horses at the corral. Pick one group and stick with it all the way to the trap).

In selecting the group of 9 you have probably selected a typical band of horses composed of a lead mare, dominate stud, subordinate mares and possibly a subordinate male. If this is true, in this typical group of horses you probably have two colts, one ♀ and one ♂, two studs and five mares. In this example the sex ratio you have captured is 33% ♂ and 67% ♀. You have automatically favored leaving more males than females on the range.

In addition, it is more difficult to catch males that are banded together in stud groups. The instinct or desire to remain together does not appear to be as strong as it is in a typical harem group. I observed and chased one group of seventeen males - the largest stud group I have ever seen. By the time we arrived at the trap we captured four of the seventeen animals.

Lone horses, which are normally older males, are not usually chased. In terms of manpower and money it would be very unproductive to attempt to corral lone wild horses. The same thing holds for bands composed of two or three horses unless they are very near the trap site. In most situations the bands of two or three horses will turn out to be all males.

Some impetus has been generated in BLM to selectively manage wild horses. One technique that will reduce reproduction is to alter the sex ratio heavily in favor of the male. If you have 200 wild horses on a range and you wish to remove 100 of them you are, during a normal round-up, going to effect a change or adjustment in sex ratio. Assuming a 50-50 sex ratio and using the data from the Winnemucca District you would end up with 59 males and 41 females on the range. (The sex ratio left on the range is the reciprocal of what was taken off). If desired this sex ratio could be further altered through the removal of more females and turning some males loose.

The automatic adjustment in sex ratio may be significant in other areas. In checkerboard land patterns where total removal may be the objective more pressure will be placed on the herd and the round-up may still be in operation long after the success ratio indicated that it should have stopped. The Hot Springs Mountain is a good example.

Using data collected on the Hot Springs round-up it is statistically probable that of the 29 animals left 24 are males and 5 are females. If this is the case, instead of having to kill 29 animals to totally remove the horses from the checkerboard area you only have to destroy five. Time will then take care of the situation.

It follows that if the data collected on sex ratio of animals captured is unreliable then data collected on foals/100 adults is also unreliable. I think this is a logical assumption because of the 29 animals left on Hot Springs Mountain there was not a single colt.

If detailed and accurate records are kept on future round-ups a larger data base will be collected and the hypothesis that I have advanced will either be proved or disproved. As most of you know, sexing horses in a corral is a time consuming and often rather difficult task. The data presented here was collected by one individual in a very exacting fashion. I feel the data is extremely reliable. If managers and round-up personnel understand the importance and uses of accurate data, more effort would be exerted to make the information as reliable as possible.