
OPEN DISCUSSION - WHAT ARE THE BIOLOGICAL BASES FOR OUR HARVEST STRATEGIES?

MODERATOR: KEVIN HURLEY, WYOMING GAME AND FISH DEPARTMENT

KEVIN HURLEY, WYOMING: We would now like to move to an open discussion on harvest strategies, not so much on the strategies themselves, but to the biological basis or bases of our varying harvest strategies.

If you look at the overhead that Bill Wishart put up yesterday, states and provinces are hunting sheep in many different ways. I'll use Wyoming for an example. From the numbers in the questionnaires, it looks like Wyoming harvests more rams than any other state in the lower 48. Approximately 183 rams were harvested in 1998, and that's from a population in the mid 6,000 range (6,300 to 6,400 sheep).

Right now we have 20 hunt areas in the state, six of which are closed, one is an any sheep area, five (including the three largest in the state) are any-ram areas, and we have eight areas that are managed under a minimum three-quarter curl regulation. These are all limited entry hunts.

In terms of the biological bases, we use an any-ram strategy to reduce or eliminate abandonment of harvested sublegal rams. We use a subjective rule of thumb that for every ten rams legally harvested, there's probably one that's shot and left; we think that's a needless waste of that resource. Hunters continue to select for mature rams, even though they have the ability to take any ram. We believe the very limited harvest of $<3/4$ curl rams is less than five percent of the total harvest. We believe this is mostly compensatory mortality for younger rams which are harvested, rather than significantly additive. We believe we are incrementally aging the ram population through time. We are not currently harvesting any females in our one any-sheep area; perhaps every other year there might be one ewe taken. We also view removal for transplant as basically a ewe harvest.

What we wanted to do next is open this up and discuss some of the other biological bases for the strategies various states and provinces and territories are using. I will start with Alberta, because I think they've been on the leading edge of ewe harvest. I'll ask Alberta to explain the biological basis for their strategies.

JON JORGENSON, ALBERTA: Yes, thanks, Kevin. In Alberta we have essentially unlimited entry trophy ram harvests. Anybody that wants to hunt rams can do so, and can buy a license. But we try to limit the harvest to older mature rams through a minimal curl regulation, which currently is four-fifths curl. In a couple of areas, we just recently increased this regulation to full curl, not so much for any biological reason, but because of a demand and a concern from hunters that the quality of the rams that are coming out of Alberta now has deteriorated considerably.

Most of our rams get taken as soon as they hit that four-fifths curl. There are enough hunters out there that they seem to be pretty successful at doing that. There has been quite a bit of concern over the poor quality of rams that is in the harvest.

We've experimented with increasing minimum size to full curl in a couple of our areas to see if we can increase the age of the rams, which we will do, but the big concern is availability of trophy rams. Whether or not we'll have the impact on the availability of trophy rams by going to full curl remains to be seen. Right now, we're only into the third year. We just finished the third year of that assessment in one area. We have yet

to have any rams taken in one of the other areas. We had the first full curl ram come out of there just this past year.

As far as ewe hunting goes, our strategy is for maintaining populations at or below carrying capacity through ewe harvests; and we try to do that throughout the province wherever we can. We usually maintain a ten percent harvest rate of the population with our ewe permits.

In some areas, we're right at the ten percent. Some areas where we want to reduce the population we feel is too high, we can increase that slightly, and there are other areas where we're a little bit lower than that.

There are some areas where there are predation issues, so that harvest rate has been lowered considerably. We do that to try to keep our populations down, keep them managed at a particular level, maintain high quality herds and good growth rates, and we seem to be accomplishing that right now. We're fairly satisfied with what we're doing and what we're achieving.

HURLEY: The long-term data set in Alberta indicates the obvious benefits are in lamb production, lamb survival, lamb recruitment, and enhanced horn growth.

JORGENSON: That comes from the Ram Mountain work that essentially shows by keeping nursery herds down, we have high productivity. Essentially, all our ewes are producing lambs. We have yearlings that are breeding, and survival rates are as high as they're going to get. We have good growth rates, both in body size and in horn growth.

So, our objective is to keep our herds at as high a quality as we can. But to do that, we have to be able to regulate nursery herd size, and we do that through ewe harvest. We're not into transplants other than there has been some transplanting out of the Cardinal River coal site, mainly because we don't have an ability right now to harvest those ewes.

So we demonstrated, and we feel have pretty good evidence to support, the benefits of ewe harvests, we try to implement those throughout the province.

JIM BAILEY, NEW MEXICO: Your goal is to take ten percent of the ewes or the ewes and female yearlings or what?

JORGENSON: It works out to be ten percent of the total winter population.

BAILEY: Lambs and ewes?

JORGENSON: That's equivalent to about 18 to 20 percent of the ewes, yearlings and lamb component.

WAYNE HEIMER, ALASKA: The biological basis of ram management in Alaska is based on 20 years of work in the Dry Creek field study. We demonstrated to the satisfaction of the general public and the Alaska Board of Game that a significant biological benefit that came through restoring and preserving the social mechanisms of sheep dominance hierarchy, breeding and survival makes biological and economic sense to harvest full curls in Alaska's Dall sheep. We have harvested significantly more full curls in the areas where we had maximum harvest than we did earlier under 3/4 or 7/8 curl regulations.

The presently accumulating data, as Ken Whitten pointed out, are a little less certain than the earlier data because those populations have declined to half the sizes they used to be. So we're not going to be killing 130 rams out of there again until we get twice as many sheep. Some of the data that we base that biological conclusion on are inferential, and if you want to nitpick them, you can probably sleep at night thinking you aren't compelled to believe what we think. That's the way these management experiences work.

With respect to ewe harvest, we do have ewe harvests in Alaska. There are several places in the state where Alaska Fish and Game suggests there are too many sheep, and they are trying to reduce them. Harvest of ewes from those areas has probably been insignificant, in terms of an actual population reduction. But where we have ewe hunts established by regulation, we kill ewes specifically to reduce populations. The rest of the ewe hunts are of political and social origin that come out of the subsistence issues that Ken and I talked about.

These ewe hunts don't exist for biological reasons and, in fact, the rationale for those ewe hunts is that they won't cause a decrease in population. I would refer anybody that's interested in how crazy things can get in this management environment we're operating in Alaska to the soon to be available proceedings of the Northern Wild Sheep and Goat Council (1998). I have an article in there that deals with the case history of several of these ewe hunts throughout the state.

NIKE GOODSON, UTAH: Didn't you have a report by Lyman Nichols in Alaska where you had a ewe hunt and then the sheep moved?

HEIMER: Yes, that was the report. What happened was we had a management situation where Lyman Nichols was hoping to evaluate classic Alberta management techniques (which weren't classic in Alberta then). The idea was to reduce the population on one mountain, and demonstrate that there was increased lamb production and that everything would be much better, because the sheep were below nutritional carrying capacity.

Initially, they tried a number of limited-entry permit hunting regimes but eventually it evolved to an open hunt for ewes. We weren't able to get people to take ewes because they didn't want to hunt ewes.

To monitor this open ewe hunt, the Department's management staff established a check station located 300 yards off the highway in a bar. Whether or not the ewe hunters who had killed ewes wanted to go up to the bar to check out, nobody knows. The biologists didn't mind having the check station in the bar; they're the ones that moved it up there from the highway. It was originally supposed to be on the road. The result was at the end of season the ewe population was way down, and we couldn't account for the number of ewes that were missing by the check out results.

Subsequently, Lyman noticed some sheep across the highway and postulated that these animals had not been killed and taken home without checking out, but had actually moved because of disturbance. If you talk to people that were there when Lyman found those sheep, they'll tell you the sheep were there all the time and Lyman just didn't notice them until he searched that area for sheep.

I think it would have been highly unusual for sheep who are traditionally linked to home ranges to be run off by a number of ewe hunters running around. That would have been a radical finding. I frankly think people didn't want to go up to the bar or maybe the guys were not keeping good records; I don't think the sheep moved. A lot of the locals didn't think they moved. Lyman's report was the best he could do.

KEN WHITTEN, ALASKA: There are a few things I guess I need to point out. One is that Alaska also had ewe hunts in a few situations where Fish and Game thinks that the population can withstand it, and we have close control over that hunt through a permit system.

And then we also have a few subsistence areas, which aren't there just for politics. They were established under state law. They're being continued under state law in conjunction with federal law, sometimes only under federal law, but those harvests have been going on for decades. Nobody can demonstrate that they've had any adverse effect on sheep populations. The actual number of ewes taken in those hunts are small. They're either-sex hunts and the native people, are just like us; they're highly selective towards older rams.

We also have another area that's open to unlimited access hunting, for any sheep, by Alaskan residents. Nonresidents have to take full-curl rams in that area. The harvest is predominantly big rams. That's what our hunters want.

We don't have very much clamor from the sport hunting public for more ewe hunts. I don't think you'll find very many working biologists now who will testify that we have to have full curl rather than three-quarter curl in order to protect populations. The full curl regulation is popular among our hunters and one thing is certain with full curl hunting; you won't harm the population in any way.

As Bill Dunn from New Mexico said (to apply it to Alaska), moose, caribou and southeastern Alaska deer pays our bills. With our limited funds, when we prioritize budgets within the department, we're not going to put much money into sheep when we're being hammered day in and day out on moose and caribou issues. Consequently, with our current full curl rules applying to most of the state and other special permit areas, we feel very comfortable with a generally popular full-curl season.

Recently, public discussions resulted in some proposals coming before the Board of Game for stricter enforcement of full-curl rules because people weren't finding enough big, trophy rams. I looked at Boone and Crockett records for the 50 largest sheep taken in Alaska. Only four of those have been taken since we legally required people to take the biggest rams. Only seven of those were taken after 1970. All the rest, 43 out of the 50, were taken before 1970. Again, people were highly selective towards big rams during that period when 3/4 curl rams were legal.

I think the key to trophy management, if you want big sheep, is to limit the number of hunters. It takes several years past minimum legal size, even if it's full-curl, for a ram to reach its maximum growth potential. When you have high levels of harvest, as we do in most areas of the state, relatively few rams and usually not the potentially biggest ones, live past that age. So if you want to produce very large rams, you need to limit participation in the hunt. You need to be able to accept rams living and often dying of old age.

HURLEY: Thank you, Ken. Again, we need to focus these comments on the biological basis for our strategies, not necessarily a description of what we're doing.

I'm not as familiar with harvest strategies in the desert states, but am curious. Are all the desert hunts for any ram? Are there any other strategies that are used? Any of the six or seven desert states want to respond?

VERN BLEICH, CALIFORNIA: California has what we refer to as a mature sheep, which is three-quarter curl animal. Our regulation is identical to the Wyoming regulation in terms of horn length, unless you have changed it since we adopted it. We can harvest sheep as young as two years of age, using that regulation. That's not the intent, but that's the regulation.

HERB MEYR, IDAHO: I can discuss the Idaho regulations.

HURLEY: Again, not the strategies, but some of the reasons why, if we can.

MEYR: Idaho is a once-in-a-lifetime-type state so, in other words, you shoot your ram, that's it. We require three-quarter curl, but we also have a caveat in there that it has to be four years old. Biological reason is that a lot of the rams broom off the horns, they never get past half curl. Our number of permits are conservative. We only have about 62 Rocky Mountain sheep permits and 48 California bighorn sheep permits. Most of the people are going to try to find the biggest ram since it's a once-in-a-lifetime. Biologically, when I talk to a lot of our game managers, they feel it's good to be harvesting rams throughout a whole age class instead of picking on your older rams.

JOHN McCARTHY, MONTANA: In Montana, we do kill ewes. In Montana we've got an any-ram type season. For the most part, we're fairly conservative on the number of permits that we issue, and the permits are based on numbers of rams that fall in or above a three-quarter curl category. What we have found is that by doing this, we essentially are taking older rams out of these populations. It also allows somebody to go out and kill a two-year-old or a three-year-old, which we feel leaves an older ram out there. Biologically, we find this more easily accommodating to the hunters and we haven't had any complaints about losses of these large rams.

The biggest problem we have in trying to put these seasons in is that we get pressure from federal agencies involved. I guess they feel they have some ownership in some of these populations. They want to set the regulations as to how many permits will be issued or put out for those areas. We also get pressure from the sportsmen's groups; they've got a large degree of ownership in these populations. We've had problems in areas where we're trying to increase the number of animals being taken to reduce population sizes, but sportsmen's groups have put enough pressure on the commission that we aren't allowed to do that.

As a result of that, we have seen die-offs in some of these areas when these populations get too high.

We believe Alberta has the right idea as far as killing ewes. We feel it results in more productive populations. The numbers of animals taken or the numbers of ewes taken are based on the number of sheep that we feel we can successfully accommodate on the winter ranges. For the most part, we've got management levels set for these populations, and are trying to keep numbers at those levels.

HURLEY: John, in the herds that you are harvesting at whatever rate or whatever percentage, have those experienced die-offs or have you been able to preclude those?

McCARTHY: The die-off in sheep transplanted from Alberta affects those populations where we were taking ewes, just as much as areas where we might not be harvesting ewes, or using ewes for transplants.

REX SOHN, UTAH: You've been talking about the federal regulations. I'd like to hear the dates of the hunt and lengths of the hunt.

HURLEY: We'll get to it in a minute after Nike's comments.

GOODSON: I won't talk to dates of hunt or length of hunt. What I want to talk about is that the effect of removing for transplanting is similar to harvesting ewes. You're removing ewes from the population. I did a study in 1984 through 1989 on a bighorn sheep population on the west side of Rocky Mountain National Park.

It was a small subpopulation. There were 35 ewes when I started and a total of about 70 sheep in the subpopulation. About 20 ewes had been removed from it in three separate removals over the seven years before I started the study.

I looked at reproductive rates of those ewes and compared them with two other subpopulations that had not had ewes removed. In that population, the reproductive levels were pretty limited. Ewes had lambs only about every other year, and they often had extended maternal behavior where they would nurse a yearling and nurse their lamb. The survival rates of lambs were pretty moderate, and there wasn't any indication in that population of a response, as far as improved reproduction.

The subpopulation which had experienced the removals did no better; in fact, somewhat worse recruitment than subpopulations that hadn't experienced removals. We can't necessarily assume we're going to get these good responses to removals; we need to know something about the population dynamics of the individual herds, and we have to monitor populations if we are removing females, because you can have an impact. You can't count on having compensatory reproduction survival.

The herd I was studying was a high elevation herd that spent the entire year above treeline, so there was a lot of density-dependent regulation in that herd because of hard winters and a very short growing season. The herd, in our opinion, wasn't capable of a large increase in productivity in response to removals. Some of these biological factors need to be considered when you're setting up a management plan, and you also need to consider the health of the population.

Using the Ram Mountain population as a model for bighorn sheep in the United States can be problematic. The last time I talked to Bill Wishart, he admitted that the Ram Mountain population has never had a die-off, and has had no contact with domestic livestock. It doesn't show any indication that it's ever picked up any of the bugs many of our herds in the United States carry because of years of contact with domestic livestock.

We know that following a die-off, you can have depressed reproduction in a bighorn sheep herd for extended periods over five, ten years. I think you need to know quite a bit about your population, its disease status and its potential for productivity in order to implement more aggressive strategies.

HURLEY: In response to Rex Sohn's question in terms of dates and timing, I don't think we want a litany of when they occur, but are there rut hunts, pre-rut hunts, and post-rut hunts? I would say they're largely pre-rut hunts, at least in Wyoming and the places I'm familiar with. Does anybody conduct or offer rut type hunts or post-rut hunts? Does Montana have a hunt during the rut?

McCARTHY: Yes, we start as early as September 15th and run through essentially the first of December.

HARLEY METZ, COLORADO: I follow the sheep situation in Colorado. As for the biological basis for Colorado, they have a half-curl rule. Some of the biological strategy that CDOW communicated to me was to keep from overharvesting the older rams. Because of the very conservative approach to ram harvest, they don't take very many rams out of a lot of their populations. They do harvest ewes in at least four different units. Normally those are the units with the largest populations which seem able to sustain that. In 1988, Colorado harvested 114 rams. We also harvested the state record ram last year, but I wouldn't count him as a Colorado ram. He was from Alberta, but he was 198 plus points.

CDOW has done something I have not read about anywhere else. We have a slot limit hunt, kind of like bass fishing. In the Georgetown herd, a very popular and accessible area, archery hunters and rifle hunters are

successful. They take the old end of the population. They have a large population, and the biologists in the last three years, in order to harvest what they consider to be surplus rams, have issued a slot limit. You can harvest a ram over a half-curl, but under a three-quarter curl in order to facilitate a harvest. In the case of our small desert population, we have maintained a half-curl rule; that has been the rule and we're only harvesting five or six rams out of those populations.

HURLEY: We're winding down. Does anybody have a comment on the biological basis of their hunting strategy?

BAILEY: This is non-biology, but we're doing a lot of experiments. We're trying this on this herd and on that state and whatnot. I don't think we have a good evaluation of what we're doing. We're not finding out whether the strategy is working, in terms of the objectives we have in mind. We may think it works, but I haven't heard any data other than Ram Mountain. That's our assumption.

HEIMER: I think what you see, Jim, is an expression of the fact that wildlife managers are the ultimate tinkerers, and they're not particularly great recorders. I think it comes back to where we started. We don't have a working hypothesis articulated for most of these strategies that relates anything to anything other than what each tinkerer thinks might be a good idea.

BAILEY: We provide a lot of lip service to active management, but the lack of applying that active management properly is the biggest failing in natural resource management, not just wildlife management.

CHRIS PAPOUCHIS, CALIFORNIA: I'm with the Animal Protection Institute. One of the things that's happening as the population becomes more urbanized, the general public is getting away from the sport hunting mentality.

One of the things I'm concerned about is something managers need to address. Up to this point in this conversation, I heard talk of keeping a healthy population and making sure there aren't die-offs. It's not clear if this is for the population's health, for its sake, or for the population to be healthy for hunters. The general public is going to keep asking very tough questions. There will be a lot of pressure on managers to make sure they can justify the biology of hunting in the best interests of the populations themselves.

I think that biologists need to address that, especially if sport hunters want to keep hunting, because unfortunately, or fortunately depending upon your viewpoint, in this country sport hunting has become more in the minority. I know I'm making this somewhat unpopular comment, but it's going to be a political reality, and I think everybody needs to think about that when they do new plans.

BLEICH: I would point out that this country was founded upon the rights of minorities being as important as the rights of the majority. We've seen wildlife management at the ballot box absolutely destroy any scientific options, in terms of natural resource management because of popular vote. The fact that something is unpopular shouldn't relegate it to a nonactivity.

PAPOUCHIS: I would agree. I think they're going to ask for the biology to show this is indeed for the health of the population and not to suit that minority. That's just a point. It's something that needs to be thought about.

BILL DUNN, NEW MEXICO: The purpose of hunting is consumptive activity. There should be a biological basis for how we set our hunting seasons and everything else to maintain the health of the population, but that's not why we hunt.

PAPOUCHIS: I understand that.

DUNN: I think that as long as we have a biological basis for maintaining the health of the population, we're fine.

HURLEY: Jim said it, Chris said it, Wayne said it, a lot of people said it. We need to do a better job of articulating what our biological reasons for hunting are. Thank you all.