APPENDIX III

WORKING PAPER ON CONFLICTING EVIDENCE REGARDING ELK HABITAT

BAKER COUNTY

COMPREHENSIVE PLAN

WORKING PAPER ON CONFLICTING EVIDENCE

The purpose of this memorandum is to identify areas of conflicting expert opinion. It will summarize the opinions offered and suggest possible resolutions.

1. IMPACT OF HUNTING: In their various comments, ODFW has indicated that development of rural dwellings has much greater impact on elk populations and habitat than hunting. They appear to concede that hunting has some impact on population, but not that it has direct impact on habitat.

Dr. Hayden-Wing is of the opinion that the single greatest impact on elk populations and habitat comes from hunting. He focuses less on the obvious impact on the elk from hunting and more on the impact on habitat caused by changes in elk behavior. Hunted populations of elk quickly become more wary of humans. Hunted populations are, therefore, disturbed by dwellings and this is the mechanism by which dwellings have impact on habitat. Hunted populations of elk avoid dwellings and, therefore, naturally reduce the habitat available to them. If hunting is reduced, more habitat is available to the elk because they become less wary of human activities associated with dwellings.

The Hayden-Wing analysis appears to be a much more sophisticated analysis. As a thesis, it appears to be more capable of explaining elk behavior. Within state and national parks and other areas where elk are not hunted, they are not intimidated by human population and activity. In these situations, they wander freely among dwellings and other human created structures. These results are much better explained by the Hayden-Wing analysis than the ODFW claims.

2. ADEQUACY OF EXISTING SURVEY METHODS: ODFW claims that its information is reliable and based on professionally accepted methodology. As evidence, they submit a 1957 document which purports to be an outline of methodology.

Dr. Hayden-Wing finds the almost 30-year old document to be less than up-to-date.

Hayden-Wing also points out flaws in the surveys relied upon by ODFW. The most obvious point is that the studies are of deer behavior and not of elk behavior. Also important is the fact that, where populations appear to decrease in areas of human activity, there was no indication that any effort was made to determine whether or not the deer were merely shifting their foraging activities on these areas to the hours of darkness.

The Hayden-Wing criticisms of ODFW procedures appear to be well taken.

Ordinance 85-7

Exhibit D

3. DATA: Many of ODFW's conclusions are based upon observations of field staff which the Department claims are adequate to base scientific conclusions upon.

Dr. Hayden-Wing points out that these materials consist of unpublished, projective observations with no measures of statistical reliability or repeatability. The data are not strong enough to justify the inferences drawn, not only because of the inherent weakness of experimental design, but also because they were not designed to provide answers to the questions to which they have been applied. They are based on deer populations and should not be used to draw inferences about specific housing density levels on elk.

Again, Dr. Hayden-Wing's observations appear to be well taken.

4. IMPACT OF DWELLINGS: ODFW maintains that dwellings have serious potential impacts on elk habitat. Hayden-Wing points out that all the referenced observations from ODFW were based upon deer and not elk. The ODFW recommended dwelling density of one unit per 40 acres for deer winter habitat is already far exceeded by the existing comprehensive plan and zoning ordinance. The evidence regarding deer does not provide a basis for a larger lot size to protect elk habitat.

Hayden-Wing cites studies in which deer herds do not behave in the ways predicted by ODFW. This appears to undermine ODFW's claim that human habitation always has negative impacts on deer and elk. In Boulder, Colorado, deer have moved into the city in spite of the availability of natural range outside of the town, and have adapted to intensive human activities, dogs, dwellings and traffic. In the opinion of Dr. Hayden-Wing, the proposed ordinance will not allow new dwellings in sufficient numbers to significantly decrease the suitability of these areas as elk winter habitat.

Until ODFW has more data or other scientific evidence, it appears that Dr. Hayden-Wing's opinions are based upon superior knowledge of the subject matter and better evidence.

5. IMPACT OF DOGS: The ODFW documents set forth accounts of negative impacts of free-roaming dogs on deer and extrapolate from this information the claim that domestic dogs related to dwellings negatively impact elk habitat.

Hayden-Wing again points out that the evidence is based upon deer activities and not elk. He further points out the primary study relied upon by ODFW concerns coon hounds which are regularly trained and legally used by hunters to run deer. This practice is neither legal nor customary in Baker County. These are not the type of dogs that would be found running loose in Baker County. The Doctor also points out technical shortcomings in the study.

It is his opinion that any threat posed to these populations by domestic dogs is minute compared to the impacts of legal and illegal hunting by man.

It would appear that ODFW's opinion is not based upon sound scientific study.

6. IMPACT OF ROADS: ODFW references a variety of studies that describe the effects of roads on big game. Hayden-Wing points out data from other studies that show that deer and elk do not always avoid roads as the ODFW document suggests. He also points out the shortcomings of the ODFW cited studies. These include failure to observe elk populations at night. Big game tend to use almost any habitat under the cover of darkness. The studies were also based upon public roads that sustained through-traffic. The nature and volume of traffic on these roads is much different than that which could be expected on dead-end access roads leading to private dwellings in Baker County.

Once again, the ODFW opinions do not appear well founded in light of the Doctor's comments.

7. THREAT OF DISEASE TO LIVESTOCK FROM FEEDING STATIONS: ODFW evidence on this subject consists of a letter claiming there is no need to worry about the transmission of diseases, such as brucellosis, between elk using feedings stations and domestic livestock using the same general areas. The key feature of the opinion is Dr. Kistner's statement that there is little evidence that Oregon elk are currently reservoirs of disease.

In the opinion of Dr. Hayden-Wing, the introduction of feeding stations into the environment greatly increases the danger of transmission of disease. When elk are concentrated, as they would be at a feeding station, potential threat of disease transmission increases. The chief veterinarian for the Wyoming Fish and Game Department is concerned about this type of disease transmission. He feels that a continuous monitoring program is essential to control and prevent spread of disease. Dr. Hayden-Wing concurs with this opinion and suggests that maintenance of a veterinary surveillance program is the only safeguard available to ensure early detection.

If ODFW is correct that no disease is present, then their conclusions may be correct. We question whether or not Baker County can rely on the fact that both populations of elk and cattle will remain disease free indefinitely. Given the danger that is inherent in this situation, it would appear prudent to follow the advice of Wyoming authorities.

JANUARY 10, 1986 DRAFT
Revised January 28, 1986

COURT 86 05 102

WORKING PAPER ON DENSITY

This document was produced as an exercise in projecting the total possible density within certain habitat areas under a full build-out scenario. Its purpose is to provide a basis for density comparison between Baker County's adopted Comprehensive Plan and the various density standards which have been advocated by interest groups who have participated in the land use process.

Of course, at current growth rates, the full build-out scenario would not happen for very many decades. And, the Plan's requirements for monitoring cumulative impact and making necessary adjustments to protect habitat may prevent full build-out on any timetable. Nevertheless, the projection is provided for purposes of comparison.

In summary, we find that the maximum projected density would be one (1) unit per 172 acres. The recommendations received by the County Court and Planning Commission range from one unit per two acres to one unit per 320 acres. ODFW recommended one unit per 160 acres, with certain conditions.

Density Calculation

The one unit per 172 acres figure was arrived at by estimating the amount of land in three categories:

1. Public lands which would have no development;

2. Lands potentially eligible for non-resource permits on 40 acres; and

3. Lands eligible for resource permits at one unit per 160 acres (EFU); one unit per 80 acres (TG); one unit per 20 acres (ME).

The results are portrayed in the following table:

Exhibit E

Ordinance 85-7

COUNTY-WIDE DENSITY PROJECTION TABLE

Type	Acreage	Percentage	Units
Public	232,692	54.5	0
Private	193,957	45.5	
Nonresource Permits	51,582	12.1	1,289
Resource Permits	142,375	33.4	1,195
Total Units			2,484

$$\text{Density} = \frac{\text{Total Units}}{\text{Total Acreage}} = \frac{2,484}{426,649} = \frac{1}{172}$$

Study Methodology

The Soil Conservation Service has not yet completed its study of land within the subject area and, therefore, the County's data is incomplete in some respects. More detailed analysis will be possible in 1986 and 1987 when more data is available. For purposes of the current study, the County made estimates based upon detailed studies of specific areas.

The choice of study areas was designed to reflect typical conditions in various areas of elk habitat within Baker County. The choice was based first on the principle of broad dispersal. The County naturally divides into four quadrants (northeast, northwest, southeast, southwest). One study area was defined in each quadrant. To be certain the results were not skewed in a particular direction, sizeable areas were examined. In no case was the area less than three U.S.G.S. Interior quad maps. The resulting areas are displayed on the attached map. They represent various combinations of the important factors of slope, ownership size and available access. The study areas comprised approximately 65 percent of the total elk habitat area. It was, therefore, a very significant sample which we feel to be an accurate reflection of the overall conditions within the elk habitat area.

Four study areas were chosen from four different and dispersed quadrants of the subject habitat area. Each of these areas has different characteristics which can be summarized as follows:

Area No. 1: The Unity Reservoir or Burnt River area was selected from the southwest quadrant of Baker County. The sample size was almost 21,000 acres of private land plus another 21,000 of federal land. Three U.S.G.S. Quad Maps were used. The eastern maps of the Burnt River Area were increasingly federally owned; therefore, the sample ended with Brannan Gulch.

Area No. 2: The Halfway-Copperfield Area was selected from the northeast quadrant of Baker County. The sample size was almost 32,000 acres of private land plus 59,000 acres of federal land. Six U.S.G.S. Quad Maps were sampled.

Area No. 3: The Tucker Flat/Sumpter Area was selected from the northwest quadrant of Baker County. It contains the Elkhorn Ridge which has been the center of much of the controversy regarding the habitat protection issue. The sample size was 35,700 acres plus 45,700 acres of federal land. Eight U.S.G.S. Quad Maps were used so as to include the whole configuration of the Ridge.

Area No. 4: The Durkee/Mineral Area was selected from the southeast quadrant of Baker County. The sample size was 43,000 acres of private land and 21,000 of federal land. Four U.S.G.S. maps were used to cover the area containing and surrounding Lookout Mountain.

After defining study areas, it was necessary to study these areas in order to estimate the amount of land falling into the federally-owned, private non-resource and private resource categories. Estimation of public lands was not difficult, as this is a known figure: 54.5 percent or 232,692 acres of federally-owned land out of 426,649 elk habitat acres.

It was more difficult to distinguish those privately held lands eligible for 40-acre non-resource permits from those private lands subject to a large minimum lot size. Several criteria were used based upon zoning code requirements and existing development patterns.

1. Lands in Excess of 30% Slope: These lands were eliminated for two reasons. First, until we have accurate S.C.S. data, 30% is a reasonable standard to identify areas which will not be eligible for septic permits. Second, construction costs on steeply sloping land discourage development. This has been recognized by most Oregon jurisdictions in estimating unbuildable lands. The Metropolitan Service District, for example, used a figure of 25% in estimating undevelopable land within the Portland metropolitan urban area. Many jurisdictions within that area eliminated even more lands by using a 20% standards. The County felt that 30% was a reasonable standard reflecting septic availability and the typical pattern of development in the rural area of the County.

Staff reviewed the slope maps for the four study areas and defined those areas in excess of 30% slope. These areas have been defined on acetate overlays and the actual working exhibits are on file with the County. The information obtained is as follows:

Area	Private Acreage	Acreage Exceeding 30% Slope
1	20,810.91	9,247
2	31,958.93	19,770
3	35,689.38	11,335
4	43,399.82	33,354
Total	131,859.04	73,706

Based upon these figures, we have calculated that 55.9% of the private acreage within the study area exceeds 30% slope. Because private acreage amounts to 45.5% of the total habitat area, the percentage of the total habitat area unbuildable due to excess slope on private lands is 25.3% (55.9% x 45.5% = 25.3%). To ensure a conservative estimate of unbuildable land, we have chosen to use only 90% of this figure or 22.7%. This builds a 10% margin of error into our calculations, which we feel to be more than adequate in light of the extensive area studied.

2. Lands Committed to Other Uses: We have also eliminated five percent of the lands in private ownership as an estimate of the amount of land devoted to such uses as reservoirs, roads, powerlines and other similar uses which constrain development. Projecting this limitation over the entire habitat area, we arrive at a figure of 2.25% of the area constrained by other uses (5% x 45.5% = 2.25%).

3. Lands Not Served by Roads: Our study has indicated that applications for non-resource permits are extremely unlikely unless the property is already directly served by a road. In the past two years, 100% of all non-resource applications have been for locations directly on a roadway. This pattern reflects the practical reality that road construction in the vast, steep and mountainous areas in question is prohibitively expensive. The costs of such construction far exceed the value for purposes of building a single family residence on 40 acres.

Our review of the maps indicated vast areas not served by roads. Frequently there was overlap between areas lacking roads and areas in excess of 30% slope. For this reason, in this study a factor of only 5% of privately owned lands was used to estimate the amount of additional land unavailable for non-resource permits. We believe that more in-depth analysis would show this to be a very conservative estimate because, in many areas, lack of available access does not overlap with excess slope. The 5% figure was reduced to 2.25% to reflect the fact that only 45.5% of

the total habitat area is in private ownership (5% x 45.5% = 2.25%).

4. Lands in Large Ownerships: Under existing County regulations, non-resource permits cannot be granted in those areas where the resulting lot division would change the overall land use pattern (Baker County Ordinance 84-2, as amended, Section 301.C.2; Section 302.C.4). For purposes of this study, we have, therefore, eliminated those areas in which the ownership acreage exceeds 500. These areas are unlikely to be approved for non-resource permits because of the zoning code requirement that approval not undermine the existing land use pattern.

This portion of the study consisted of a review of computer printouts prepared by the County's Tax Department. The computer printouts are on file with the County and indicate, in ascending order, the size of the ownerships within each study area. This information is portrayed in the following table:

Area	Private Acreage	Total Ownerships	Ownerships 500+ Acres	500+ Ownership	% of Acreage 500+ Ownership
1	20,810.91	26	11	18,909	91.0
2	31,958.93	68	19	26,226	82.0
3	35,689.38	226	12	15,587	44.0
4	43,399.82	36	19	38,680	89.1
TOTAL	131,859.04	336	51	99,462	75.4

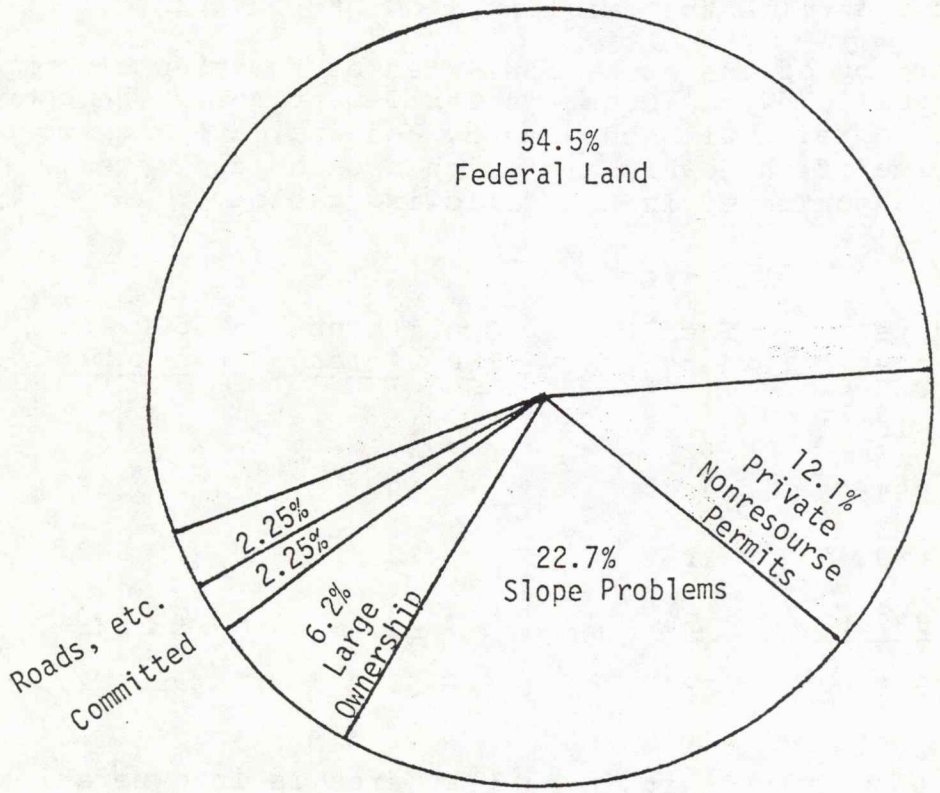
While 75.4% of the land within habitat area is in ownerships exceeding 500 acres, an adjustment must be made in order that land not be double-counted due to factors such as excessive slope or lack of road availability. The following process was used to eliminate the possibility of double-counting:

75.4	% Acreage 500+ acres
-(5.0)	Land eliminated due to lack of roads
-(5.0)	Land committed to other uses
-(50.3)**	Excessive Slope
15.1%	Adjusted private land unavailable for non-resource development due to land use patterns.

**50.3% is equal to 55.9% actual excessive slope reduced by 10% for margin of error.

This 15.1% figure corresponds to 6.9% of the total habitat area (15.1% x 45.5% = 6.9%). To ensure a conservative estimate, we have further reduced this number by using only 90% of it, or 6.2%. This 10% margin of error is ample in light of the size of the sample area.

The following is a graphic portrayal of the results of this study:



This graph portrays the information obtained by averaging results of the studies of the four areas. The Planning Department's study documents and calculations are available upon request. Some of the documents are attached hereto as exhibits. The following is a description of the methodology used in developing the data:

1. Lands in Excess of 30% Slope: A retired cartographer with 27 years' mapping experience with the U.S.G.S., acting as a volunteer for Baker County, has outlined all areas where a template showed the contours to be in excess of 30% slope. These

outlined areas were then planimetered to estimate the acreages. Each U.S.G.S quad map used in the sample was individually done and then combined into the four study units depicted on page 11 this working paper. The four study areas were then combined to reflect excessively steep land for the entire sample. These calculations are contained on page 12 of this report. This percentage was then projected for the entire County on the circle graph and in our conclusions.

2. Lands in Large Ownerships: Each of the U.S.G.S. quad maps used in the sample was given an acetate overlay on which individual private ownerships, not tax lots, were outlined. The acreage of each ownership was calculated from information from the Assessor's office. These acreages were input into the computer which arranged them in ascending size, calculated the median, and totalled the acres of private land on each map. The County then selected 500 acres as the definition of an ownership pattern that if present, would clearly disallow non-resource partitions for development because of the prevailing large ownership pattern.

3. Federal Lands: We have included all federal land in the nondevelopable category. This is 54.5% of all elk habitat area. For simplicity sake, we have not removed state-controlled lands, such as ODFW-controlled land, from the private lands category. The actual area of undevelopable land is, therefore, larger than the 54.5% indicated. This helps to ensure that the projected number of dwelling units is, if anything, overstated rather than understated.

ODFW has informally questioned the inclusion of federal land in density projections. We can see no other method of arriving at an overall projection of the density of development within elk habitat areas. Substantial portions of the land are, in fact, in public ownership and, therefore, the development density is zero. This density must be averaged with the private developable land in order to have a realistic estimate of the average density throughout the habitat area.

If public lands were not calculated as a part of the projection, it would be impossible to arrive at an overall projection that could be compared area-to-area and county-to-county. Various counties have differing amounts of publicly-owned land within elk habitat areas. Without averaging in a factor reflecting the amount of public ownership, it would be impossible to compare density calculations and, therefore, compare the degree of protection offered by the plans of neighboring counties. If public ownership is not averaged into the figures, then a large percentage of federal ownership would become a penalty imposed on a county. For example, if the elk habitat area within one county contained no federal land and one unit per 160 acres was permitted, the overall density would be

one unit per 160 acres. If another county's habitat area contained 50% federal land and it were required to restrict development on private land to one unit per 160 acres, the overall density within its habitat area would be one unit per 320 acres. The resulting difference in the treatment of the habitat areas between the two counties would be explainable only due to a statistical artifact produced by the varying percentage of federal ownership. It would not be the result of consistent application of policy or scientifically based analysis of the overall impact of development on elk habitat.

One of the objectives of the zoning ordinance is to protect habitat. Some of that land is protected already by virtue of public ownership. Other land is protected by existing ordinances and still more land is protected by special development regulations relating specifically to elk habitat areas. Ignoring public ownership as a factor in the protection of habitat would be ignoring the single greatest factor in Baker County. Any rational methodology for evaluating overall density must take into account public ownership as well as zoning code factors. These are both essential elements in designing habitat protection.

Finally, it is necessary to consider the density available on federal land in running the calculations because of the purpose of the task. ODFW has targeted one unit per 160 acres as a reasonable standard. This standard was not designed solely for Baker County. In order to determine whether the County's regulations come close to meeting this standard, it is necessary to take into account the protection provided by the zoning code as well as public ownership. If public ownership is ignored, the density figure produced will be meaningless to achieve the purpose for which this density projection is being undertaken.

4. Density Calculation Assumptions: Within the lands projected to be available for non-resource permits, the density was assumed to be one unit per 40 acres. This is the smallest lot size permitted for non-resource permits. Lands under federal ownership were, of course, assumed to have no development. The remaining lands, which fall into the category of privately-owned resource land, are made up of three zoning districts: EFU, TG and ME. EFU permits one unit per 160 acres. TG permits one unit per 80 acres. ME permits one unit per 20 acres. Within the entire elk habitat area, there are 193,957 acres of privately-owned land of which 68% is EFU, 31.6% is TG, and .4% is ME. The privately-owned non-resource lands within the study area were assumed to be made up of these three zoning districts in the same percentage proportions.

In other words, 33.4% of the total land area is projected to be available only for resource-related dwellings. This 33.4% of acres amounts to acres of land available only for resource-

related development. Based upon the above assumptions, the number of units available area as follows:

	EFU	TG	ME
% of Land	68.0%	31.6%	.4%
Acres	96,815	44,990	569
Min. Lot Size	160 ac.	80 ac.	20 ac.
Units	605	562	28

Total: 2,484 Units in Resource Area

The result of the projection is that 2,484 units could ultimately be constructed within the resource area, assuming full build-out under current minimum lot sizes.

The 33.4% of the land available only for resource-related development was arrived at based upon the projections displayed in the circle graph. The figure is reached by totalling the various areas of privately-owned land which are not available for resource-related development for the following reasons:

Excessive slope:	22.7%
Large ownership:	6.2%
No access:	2.25%
Committed:	2.25%
Total:	33.4%

With 54.5% of the land in public ownership and 33.4% of the land unavailable for non-resource permits, we conclude that the remaining 12.1% of the land is available for non-resource-related development at one unit per 40 acres. This amounts to 51,582 acres. The total number of available units, 40 units per acres, would be 1,289. The total number of units that could be constructed within all elk habitat areas can be calculated as follows:

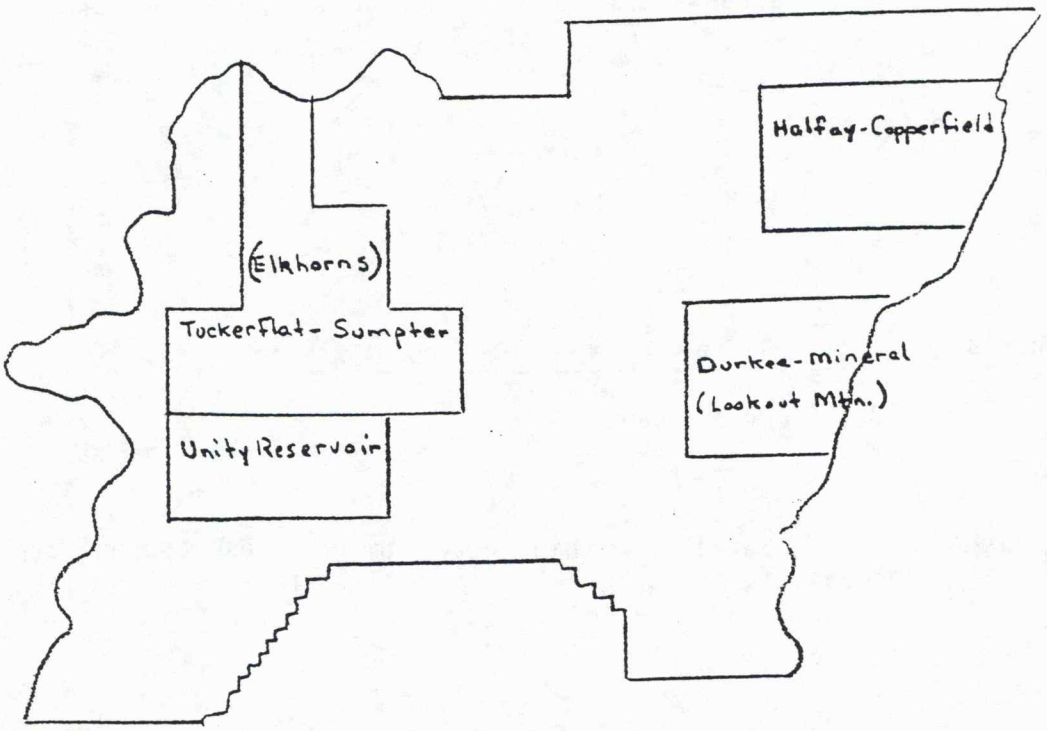
Federal land:	0
Private resource land:	1,289
Private non-resource land:	1,195
Total:	2,484

If 2,484 units are constructed on 426,649 acres, the overall density is one unit per 172 acres.

CONCLUSION

Based upon the above projections, the overall density of development in Baker County elk habitat areas could be as high as one unit per 172 acres. This assumes full build-out and is based upon a maximum number of dwelling units as indicated in the above discussion.

VICINITY MAPS FOR SAMPLE AREAS USED IN DENSITY PROJECTIONS BAKER COUNTY GOAL 5 STUDY



AREA TOTALS OF 30% OR GREATER SLOPE

Burnt River Area (#1)

9,247 acres = 44%

Durkee/Mineral Area (#4)

33,354 acres = 77%

Tucker Flat/Sumpter Area (#3)

11,335 acres = 29%

Halfway Area (#2)

19,770 acres = 62%

Combined 4 Areas - Total Acreage Greater than 30% Slope

73,706 acres = 56%

Of approximately 131,858 acres within the 4 sample areas, approximately 73,706 acres, or 56%, is at, or greater than, 30% slope.

APPENDIX C

ADDENDUM TO JUNE 17, 1985, REPORT BY LARRY D. HAYDEN-WING

This appendix contains responses to documents submitted to Baker County by the Oregon Department of Fish and Wildlife on June 26, 1985, after the preparation and submission of the main body of this report.

I. Response to document entitled "ODFW Participation in Local Planning: Documentation of Conflicting Uses and Big Game Resources; compiled by Neal Coenen, Land Use Coordinator; June 7, 1985, as Revised in Presentation During LCDC/Baker County Contested Case Hearing."

The above-described document was originally presented by Neal Coenen at the LCDC contested case hearing on the Baker County Enforcement Order in Salem on June 10, 1985, and was submitted, along with attachments, as DLCD Exhibit O in the record of that hearing. My comments here are limited to the contents of that document and its attachments, as revised and submitted to Baker County on June 26, 1985.

The central thrust of this ODFW document is to justify ODFW's recommended density levels for dwellings on big game winter range, with major emphasis on estimating potential impacts of the human-related activities associated with dwellings (roads, dogs, etc.), as well as impacts of the dwellings themselves.

A. Dwellings. This section of the ODFW document (II.A) contains numerous testimonials of ODFW biologists concerning reductions in deer numbers they have observed when housing developments and subdivisions have been constructed. My response to this section is as follows:

1. All of the observations referenced concern deer, not elk. The ODFW recommended dwelling density of 1:40 acres for deer winter habitat is already met or exceeded by the proposed Comprehensive Plan and Zoning Ordinance Amendments described in Appendix B of this report. Since elk are the species at issue, I do not feel that it is relevant to present deer data as the basis for evaluating and solving elk issues.

2. There are data from other studies and circumstances that show that deer do not always respond to human habitation and activities in the ways described in the ODFW biologists' reports. A case in point is the resident deer herd in Boulder, Colorado. A sizeable mule deer herd inhabits this city. In fact, the city has engaged a wildlife consultant to study possible methods of getting and keeping the deer out

of the town, where they are creating problems. These deer have moved into the city in spite of the availability of natural range outside of town and have adapted to intensive human activities, dogs, and traffic. This study was conducted by Allen Crockett, is in press, and will soon appear in the Proceedings of the Second National Symposium on Issues and Technology in the Management of Impacted Western Wildlife, Thorne Ecological Institute, Boulder, Colorado.

3. There is some question in my mind as to whether or not deer use of some of the development areas actually decreased. Even though the numbers of deer counted during trend and classification surveys were observed to decline following development, there was no indication in these reports that any effort was made to determine whether or not the deer were merely shifting their foraging activities on these areas to the hours of darkness. How do we know that the reduction in deer numbers observed during the daylight counts reflects a real change in numbers of deer using the area and not just a change in deer behavior?

4. The construction of new dwellings within the identified elk habitat area in Baker County should not significantly decrease the suitability of these areas as elk winter habitat for the reasons previously set forth in Section V.D. (pages 25 to 29) of this report.

5. The materials presented in this section consist of unpublished, projective observations with no measures of statistical realiability or repeatability. The data are not strong enough to justify the inferences drawn, not only because of the inherent weaknesses of experimental design described above, but also because they were not designed to provide answers to the questions to which they have been applied. They are deer trend counts and should not be used to draw inferences about potential impacts of specific housing density levels on elk.

6. If dwelling density level is the important criteria that ODFW claims it to be, why hasn't ODFW, or anyone else, ever conducted a study on the subject? How can county residents be expected to accept criteria on housing for which there is no substative supporting evidence? Is it reasonable to ask county landowners to accept significant limitations on their property rights on the basis of what ODFW thinks will be the result of an experiment that has never been conducted?

B. Dogs. This section (II.B) of the ODFW document sets forth accounts of the negative impacts of free-roaming dogs on deer as described in two reports in the professional wildlife literature and one unpublished ODFW study.

1. Lowry and McArthur Paper. This is a valid study but has very limited applicability to the Baker elk habitat conflict. The paper deals entirely with deer and is not

applicable to elk. In fact, the paper deals primarily with white-tailed deer (only three mule deer were killed by dogs), which is not even the primary deer species of concern in Baker County.

2. Anderson Thesis. This thesis is also a valid study that has little, if any, applicability to the Baker County elk habitat issue because:

a. The paper deals entirely with deer, not elk;

b. The paper deals entirely with white-tailed deer, not mule deer;

c. The study was conducted in Tennessee where the environment and social customs are very different than Baker County. In Tennessee, dogs (coon hounds, in particular) are regularly trained and legally used by hunters to run deer. This practice is neither legal nor customary in Baker County.

d. The dogs used in the study were coon hounds which are specialized hunting dogs with large bodies and great endurance that are trained to track and chase deer and other species, such as lions and bears, until the quarry is brought to bay for the hunter to shoot. If the hunter doesn't get there soon and the quarry can't climb a tree, the pack of dogs will kill it. These are not the type of dogs that would normally be found running loose in Baker County.

e. Free-roaming dogs that occur in livestock areas of the west usually don't live very long. Dogs that run game will also run livestock and are quickly controlled by ranchers or game management officials.

f. Using data from this study to estimate the radius of canine impact around a dwelling is not valid because of the highly specialized nature of these dogs and the low probability that one, let alone a pack of them, will be running big game in Baker County.

g. In my opinion, we should control dogs and not restrict people from building on their own property just because there might be a problem with their dogs. If some homeowners and their dogs abuse other people's property, such as big game or livestock, they and their dogs - not everyone and his dog - should be singled out for appropriate action.

3. Track Count Study. Although both deer and elk are mentioned in the ODFW document (page 7) as being part of this study, no data on elk were attached. Since only a brief section of the result section of this paper was included, it is not possible to evaluate the validity of the conclusions drawn. Several questions that pertain include:

a. Other factors besides the location of dogs will influence which areas deer prefer and where they cross the study area, e.g., location of preferred forage and feeding areas and topographic and vegetative features. Were these and

other potential influential factors reported and taken into consideration in the interpretation of results? How do we know that the deer were responding to dogs and not to other environmental features?

b. Were dogs loose on the study area during the night as well as during the day? Could the deer have used the dog-crossing areas as night, if they so chose, and not have encountered dogs? Was this documented?

c. How substantial was the sample of dog tracks, or how many steps were tallied? Only percentages, which do not reflect sample size, are compared in the diagrams.

4. General Comments. There are no studies that I know of that report on dogs running elk, and I have had personal experiences that lead me to believe that dogs probably don't run elk very often or for very long (See Section III.E.4.b., page 12, of this report).

Deer have co-evolved in the same habitats with coyotes and wolves over thousands of years. How have they survived all these years if, in fact, domestic dogs now pose a threat to their existence? I submit that the threat posed to deer by domestic dogs is minute compared to the impacts of legal and illegal hunting by man.

C. Roads. This section (II.C.) of the ODFW document references a variety of studies and reports that describe the

actual or anticipated effects of roads on big game. My comments on these references are as follows:

1. As previously set forth in Section VI (pages 30-32) of this report, I question the generalized applicability of these road findings to other circumstances and, in particular, housing density standards.

2. There are data from other studies and circumstances that show that deer and elk do not always avoid roads as the ODFW document suggests. Cases in point include:

a. Deer in Wyoming are attracted to volunteer yellow clover along the interstate highways and other roadways. These deer do not appear to be perturbed by the traffic. They regularly bed within the road right-of-way and are seen feeding during both day and night. The same phenomonen occurs along the access roads to open pit coal mines and on the revegetated top-soil piled along roadways on the mine sites. These deer quickly adapt to the traffic and ignore it.

b. I have personally observed elk feeding and bedded within 100 yards of heavily-travelled secondary forest roads (graded and gravelled) in the Medicine Bow National Forest in Wyoming during the elk archery season.

3. It does not appear from the data presented (Thomas; Ward, et al) that night observations of elk behavior, in respect to their use of areas adjacent to roads, were

made. How do we know that they weren't using these areas at night? My experience has been that big game uses most any habitat they choose to under the cover of darkness.

4. All of the road studies cited involved secondary public roads that sustained through traffic. The nature and volume of traffic on such roads is different than that expected to occur on dead-end access roads leading to private dwellings. People who live in and on an area generally are more conscientious and responsible towards their own property, and the associated wildlife, then general travellers and the drivers of commercial vehicles who are found on public roads. I would expect traffic on private access lanes to be lower and road speeds slower than on the public secondary roads referred to in the ODFW document. I do not feel that the results of the studies cited (Thomas, Ward, et al, and Turland), which all involved public roads, are applicable to driveway access roads in Baker County.

5. Public access and traffic on private roads which lead to occupied dwellings are more easily controlled than they are on public roads and, therefore, impacts that might occur from use by the general public can be controlled, if necessary (e.g., by use of gates and locks).

6. It is not possible to evaluate fully the results of the Tumalo Road Closure Study since the document does not

contain a methodology. Questions that this document raises in my mind include:

a. How and when were deer counts conducted and what were the sample sizes? Based on the numbers listed in the document, it appears that the magnitude of the conclusions drawn may be disproportionately large in relation to the apparently relatively small sample size of the study.

b. Were dead deer counts conducted before and after the road closure? Such data would provide a very direct indication of impact differences.

c. Did the differences in ratios and number of deer counted reflect true differences between treatments of the area (open versus closed road) or where they produced by behavioral differences in the deer associated with the changes in human use of the area. It is not unlikely that during the years of high snow machine traffic on the area that the deer shifted their activity patterns to the hours of darkness. Such behavior would make it difficult to sample the deer population accurately since surveys are normally conducted during daylight hours. It is also not unlikely that when the road was closed to snow machines the deer altered their activity pattern to include more daylight hours. Such a shift in behavior would result in a greater proportion of deer being visible and, therefore, enumerated during the daylight surveys. This could lead to the erroneous conclusion that more deer were present.

7. The Aney drive-way model is based on assumptions that I do not agree with and have previously described in Section VI (pages 30 to 32) of this report. Aney has applied generalized findings from road studies conducted elsewhere to the establishment of specific housing density standards for Baker County. I feel that this constitutes excessive extrapolation of data to circumstances where there is no substantive evidence of applicability.

II. Response to letter written by T. P. Kistner, Professor of Wildlife Ecology, Oregon State University, on March 13, 1984, to Mr. Phillip F. Dahl, Pacific Coast Bull Test Station.

The ODFW document entitled, "Comments on Baker County Proposed Ordinance 85-7," at Section 3.F., cites this letter as justification for not needing to worry about the transmission of diseases, such as brucellosis, between elk using feeding stations and domestic livestock using the same general areas. ODFW bases this conclusion on Dr. Kistner's statement that there is little evidence that Oregon elk are currently reservoirs of livestock-transmissible diseases and that they are no greater potential reservoirs than the domestic livestock animals themselves.

I do not disagree with Dr. Kistner's statement concerning low to no incidents of livestock-transmissable diseases in Oregon elk. I do, however, question ODFW's application of this information and the conclusions they have drawn from it. In my opinion, the potential for transmission of disease from livestock to elk and then back to other livestock is a continuous possibility and one that is magnified by concentrating elk on feeding stations and increasing their interactions with livestock. Dr. Kistner concludes that elk may not (presently) be as much of a disease-transmission threat to cattle as other cattle are "since they [the elk] are more scattered in most cases" (emphasis added).

When elk are concentrated, as they would be at a feeding station, the potential threat increases. Dr. Tom Thorne, State Veterinarian for the Wyoming Fish and Game Department, and his colleagues have expressed concerns about the potential for transmission of brucellosis, which is found in winter-fed herds in Wyoming, to domestic cattle and feels that a continuous monitoring program is essential to control and prevent spread of this disease (see applicable Section III.F.4., pages 19 to 21, of this report). I know of no reason why a parallel situation might not occur in Oregon in the future as elk feeding programs increased. The maintenance of a veterinary surveillance program is the only safeguard available to insure

early detection and the lead time necessary to shortstop problems.

Submitted to the Baker County Court on July 1, 1985, by:

DR. LARRY D. HAYDEN-WING

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January 20, 1986

To: Baker County Court

From: Dr. Larry D. Hayden-Wing, Wildlife Consultant

Re: Revised draft of Ordinance 85-7

I have reviewed the Planning Commission draft of Ordinance 85-7 along with the additions suggested by Mr. Tim Ramis in his letter (and enclosures) of 12-31-85 to the Baker County Court. It is my opinion that the measures proposed in Ordinance 85-7 are more than adequate to protect and maintain the elk resource in Baker County.

Furthermore, it is my opinion that housing density levels of the magnitude likely to occur in Baker County, and as controlled by the restrictions imposed by Ordinance 85-7, have much less to do with the welfare and status of the elk population than does the exposure of these animals to sport hunting. It is almost certain that these elk would make much more complete use of habitats available to them if they were not hunted - and thereby conditioned to fear man. It is not elk that Baker County is being asked to protect, but the special-interest sport of elk hunting. Most states require elk hunters, not private landowners, to support and protect the sport of elk hunting. It would be more in step with professionally-accepted wildlife management practices if the goal of ODFW was to manage elk herds with funds obtained from elk license fees - and not depend upon the heavy subsidy of forage and habitat heretofor provided free by private landowners.

The preface to the Oregon Game Commission's (OGC) Revised Game Handbook states that "---the OGC has developed many new (emphasis added) concepts of big game management." The handbook is dated 1957, however. In the wildlife management profession concepts considered as new 29 years ago are hardly new in 1986 and have, in most cases, been replaced by more accurate and sophisticated technologies. That the ODFW is using out-of-date methods is apparent when their bases for determining winter range boundaries and high use areas are examined. Instead of using quantitative annual winter counts of animals and/or their pellet groups (droppings) ODFW has merely presented the regional biologist's opinion as to where most of the elk are most of the time. I do not feel that it is reasonable to ask the residents of Baker County to respond to hearsay evidence about elk habitat when quantitative data could be obtained through the application of commonly-accepted and widely-applied methods of modern-day wildlife research and management.

Sincerely,

Larry D. Hayden-Wing

Larry D. Hayden-Wing, Ph.D.

cc: Tim Ramis

Ordinance 85-7

Exhibit F