ELK VIEWING IN PENNSYLVANIA: AN EVOLVING ECO-TOURISM SYSTEM

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Abstract: In 1997, the Pennsylvania Game Commission established an Elk Viewing Area within Pennsylvania's elk range. The viewing area has become the focus for a developing eco-tourism system. During the four years of operation, a research team from Penn State has measured the number of visitors, their expenditure patterns, and other parameters of their visit. The trends observed during this period provide a useful insight into an evolving eco-tourism system.

Introduction

Elk, *Cervus elaphus canadensis*, were indigenous to Pennsylvania before the late 1800s. However, the original herds were extirpated by 1877 (Shoemaker, 1939), largely because of unregulated hunting pressures and the wide-scale harvest of the state's forests.

The resurgence of second growth hardwoods throughout much of the state during the early 1900's gave cause for the re-introduction of elk to the new forest system. From 1913 to 1926, 177 Rocky Mountain elk (*C. e. nelsoni*) were introduced to northcentral Pennsylvania (Bryant & Maser, 1982; Gerstell, 1936; Latham, 1954). A hunting season was established in 1923 and continued until 1932, when declining elk numbers caused it to be suspended. The remaining herd settled into Elk and Cameron Counties of northwestern Pennsylvania. Through a concerted management effort, led by the Pennsylvania Game Commission, the herd increased to nearly 300 animals by 1996. In its 2001 survey, the Commission identifies over 600 elk (Cogan et al., 2001).

The current success of these unique animals has not gone unnoticed by the public. In 1997, an elk viewing area was established on Winslow Hill, near the town of Benezette. Elk are a source of continued interest and pride among residents and visitors to their range (Strauss et al., 1999; Lord et al., 2000a). However with the expanded herd size, has come a call for reestablishing an elk hunting season. The Pennsylvania Game Commissions released its Elk Hunt Advisory Committee's report in April of 2000. That report supports the establishment of an elk hunting season (Cogan, 2000).

Prior to the announcement of the hunting season, Lord et al. (2000b) examined the opinions of visitors about an elk hunt. They found opinions split, with certain subgroups of the audience strongly for or against the concept.

Procedures

A series of random on-site interviews were obtained over the four-year study along the main road and observation site. Over 1,400 interviews were obtained during 155 survey days, providing information on visitor origins, travel plans, party sizes, expenditures, allied recreational interests and expectations.

Total attendance was developed from an allied system of vehicle counts taken along the main viewing road and observation areas. Vehicle counts were expanded to visitor days using passenger load and travel data obtained from the interviews. Two attendance models were developed, one which depicted daily use patterns and a second that analyzed seasonal trends, with the latter organized as triangular distributions (Strauss et al., 1999). These efforts provided annual estimates of total attendance on a weekly and monthly basis.

Expenditures were identified on a visitor day basis (one person's visit during some portion a day), classified by resident and non resident visitors, and further stratified as to the types, amounts, and locations of purchase. Total expenditures were developed from attendance estimates and were entered to an input-output model for the two-county region. The IMPLAN model provided the economic structure of the two-county region (MIG Inc., 1996). Non resident visitor expenditures were traced by the model in terms of their direct and secondary (indirect and induced) impacts within the region and were measured by total sales, value added, salaries and wages, and employment.

Results

Visitation

Daily visitation patterns show a pronounced seasonal variation in elk viewing. The prime viewing opportunities occur in the fall (September - November), during the elk rut, as the bulls are assembling their harems (Figure 1). The first two falls after the viewing area was established had peak usage of over 3000 people on some weekend days. At this level, both the viewing area and the associated road system were overwhelmed. By the third fall, these extremes were no longer observed, as visitation spread to the late summer (Table 1).

Table 1. Seasonal Attendances at the Elk Viewing Area

	Year 1	Year 2	Year 3	Year 4
Fall	35,781	49,461	38,094	42,820
Winter	3,225	5,506	3,715	3,331
Spring	6,993	5,621	4,672	
Summer	5,926	12,162	12,221	
Total	51,925	72,749	58,702	63,624

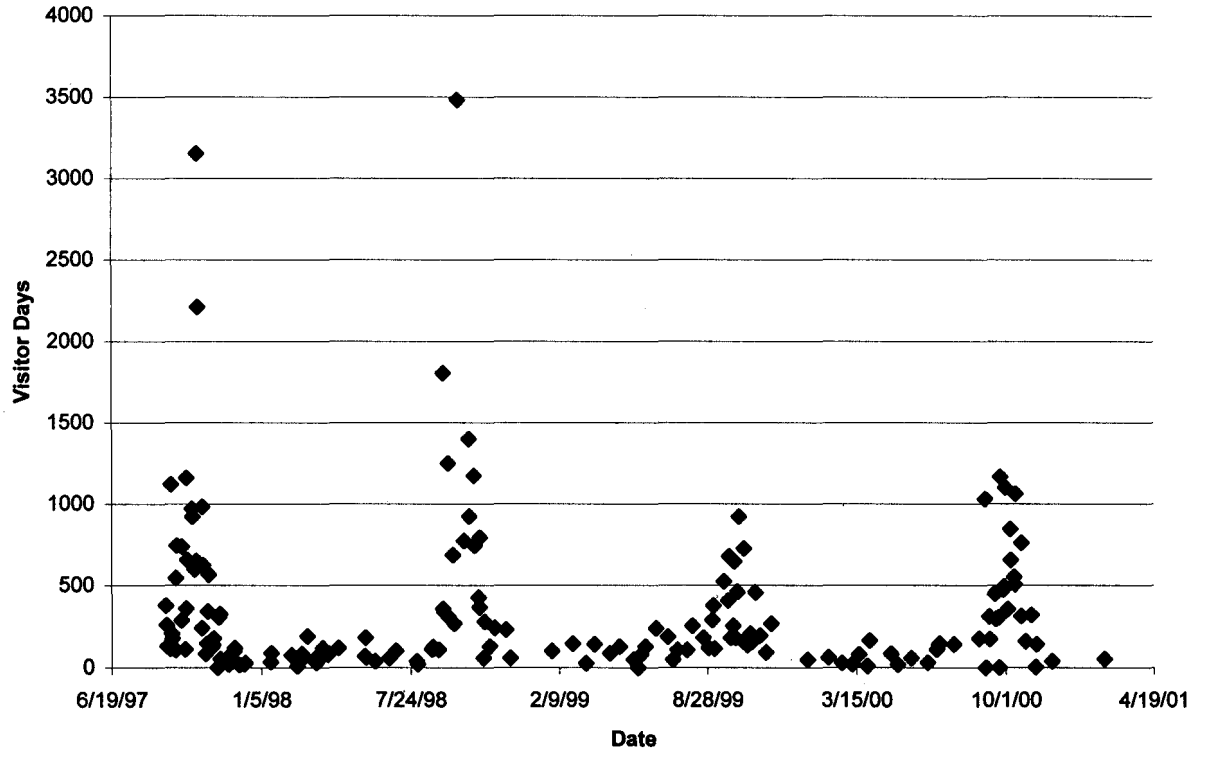

Figure 1. Daily Visitation Observed at the Elk Viewing Area

Overall attendance for the first year was just under 52 thousand visitor days. The second year saw significant increases in both the fall and the following summer seasons, for an annual total of over 72 thousand visitor days. In the third year, the fall attendance dropped back to the level observed in the first fall. Winter, spring and summer remained at about the same levels, with the third summer still significantly higher than the first summer. The fourth fall showed an increase from the third fall, though not as high as had been observed in the second fall. Total visitation for year four was estimated at 64 thousand visitor days. The spring and summer estimates were based upon patterns observed in previous years, rather than actual observations.

Resident visitation showed a definite peak in the second year with over 9 thousand local visitor days (Table 2). This was over triple any other year's resident visitation. Non resident visitation also peaked that year. Since the second year, resident visitation dropped steadily, while non resident visitation declined in the third year, but increased in the fourth.

Table 2. Trends in Resident and Non resident Visitation

	Year 1	Year 2	Year 3	Year 4
Resident	3,042	9,294	3,040	2,390
Non resident	48,883	63,455	55,662	61,235

Prior Experience

Starting with the second year, respondents were asked about the number of years that they had been viewing elk in the area. Overall, the average was 4.4 years, with a third of the visitors being first time elk watchers (Table 3). One year later, the average had increased by exactly one year (5.4 years), with one third still identified as first time visitors. The fourth year was differed significantly from the first two, with the average dropping to 3.8 years and over half of the people listed as first time visitors to the elk viewing area.

Non resident Expenditures and Economic Impact

During the first year that the viewing area was open, non resident visitors spent almost $20 per visitor day (Table 4). Food ($7.94/visitor day), transportation ($5.27/visitor day), and lodging ($4.03/visitor day) were the largest expenditure

Table 3. Prior Experience in Viewing Pennsylvania's Elk Herd

Study Year	Previous Visits (yrs.)	First Time Visitor
1998-1999	4.4	34%
1999-2000	5.4	32%
2000-2001	3.8	52%

categories. The next year, average expenditures dropped precipitously to $8.66 per visitor day. Food ($2.96/visitor day), transportation ($2.89/visitor day) and lodging ($1.96/visitor day) still lead expenditure categories, albeit at much lower levels. Expenditures increase in the third year ($14.33/visitor day) and fourth ($26.45/visitor day). Notable increases in year three were food ($5.53/visitor day) and lodging ($5.03/visitor day). In year four, food ($9.20/visitor day) and lodging ($8.90/visitor day) rose to new highs. Meanwhile, transportation expenditures ($5.23/visitor day) also increased to the levels seen in year one.

The economic impacts follow directly from the expenditure levels and the number of non resident visitors. Total expenditures in year one were $0.9 million (Table 5). In year two, even with increased attendance, only $0.6 million was spent in the region. By year three, total expenditures increased to $0.8 million, and in year four, it doubled to $1.7 million. Total sales impacts followed the same pattern, $1.2 million in year one, $0.9 million in year two, $1.1 million in year three and $2.3 million in year four. Employment impacts in the two-county region showed similar trends over the four years (30 jobs, 21 jobs, 27 jobs, and then 54 jobs).

Hunting Opinion

When visitors were asked their opinions about a "limited hunt outside of the major viewing areas", a majority expressed approval. In the first three years, just over half approved (56%, 53% and 55% respectively) (Table 6). In the spring of the third year the Game Commission announced the details of a proposed elk hunting season. Hunting approval in the following fall rose to 67%.

Table 4. Non resident Expenditures for Elk Viewing

Season	Trans.	Food	Lodg.	Photo	Other	Tour	Total
'97-'98	$5.27	$7.94	$4.03	$0.20	$1.58	$0.40	$19.43
'98-'99	2.89	2.96	1.96	0.32	0.49	0.03	8.66
'99-'00	2.79	5.53	5.03	0.06	0.89	0.04	14.33
'00-'01	5.23	9.20	8.90	0.36	2.76	0.00	26.45

Table 5. Economic Impact of Elk Viewing by Non residents

Category	Year 1	Year 2	Year 3	Year 4
Non resident visitor-days	48,883	63,455	55,662	61,235
Expenditures per visitor-day	$20.23	$9.38	$15.00	$27.17
Total expenditures	$909 K	$595 K	$835 K	$1,663 K
Total Impacts	$1,235 K	$873 K	$1,134 K	$2,259 K
Job Impacts	29.8	20.9	27.3	54.4

Analysis of Trends

Visitation

The establishment of a formal elk viewing area attracted large number of visitors to the region. Much of this usage was centered around the fall elk rut. Extreme crowding was observed on several weekends during the peak of the first two seasons. As the third year approached, a significant increase in summer visitation was evident, along with some reduction in the attendance on peak viewing days. Severe cases of congestion were no longer apparent. In year four, total visitations increased, though without extreme crowding. Prior to the fourth season, improvements had been made to the road system, including increased parking at key locations around the viewing area. It seems that after the second fall season, the visitors had learned of earlier congestion and spread their usage to both the early rut season and to weekday periods. Combined with improvements in the road system, overall visitation had increased without detracting from the visitor experience.

Expenditures and Economic Impacts

There are few opportunities to spend money in this rural area. Both food and lodging are limited in the immediate region of the elk viewing area. This was further aggravated in the second year when the town's only gas station temporarily shut down its pumps. As a result, regional gasoline expenditures declined and did not recover until one year after their return to service.

New businesses have appeared, including an "Elk Country Store," a wood carving shop, and a helicopter tour operator. The increase in miscellaneous spending reported in year four may be related to the increased opportunities. However, note that none of the viewers interviewed reported that they had taken a helicopter tour. Apparently, this latter service is either infrequently used or their clients don't mix with the more plebeian crowd on the ground.

Non resident expenditures dropped during year two followed by a steady increase in the next two years. In terms of economic impact, the low expenditures in year two were somewhat offset by the large number of non resident visitors. Increase impacts were observed in the subsequent years as attendance ebbed and then bounced back and average expenditures increased.

Table 6. Portion of Visitors Approving of a Limited Elk Hunt

Season	Percent Approving.
1997-1998	55.5%
1998-1999	53.4%
1999-2000	55.1%
2000-2001	67.3%

Hunting

During the first three years, opinions about and elk hunt were split, with just over half of the visitors approving of the concept. During the spring and summer prior to the fourth year, the details of a proposed elk hunt were announced by the Pennsylvania Game Commission. Following this, approval increased significantly with two out of three visitors approving. Earlier analysis found that perceptions of a small herd size and animals habituated to humans were the main reasons for disapproving of a hunt. The details of a formal elk hunting proposal seems to have alleviated some of these concerns.

Experience

Prior experience was tested to see if it was a significant predictor of expenditure levels and of opinions about an elk hunting season. A negative correlation was found when non resident expenditures were regressed against the number of years of elk viewing experience (Table 7). Visitors were found to spend $0.33 less per visitor day for each year they had visited the region. Note that many of the people with a history of prior experience had hunting cabins in the area and consequently may have had fewer needs to make purchases during their trip. Visitors with more experience were more likely to disapprove of a hunt (Table 8).

Table 7. Relationship between Prior Experience and Expenditure Levels

Effect	Coefficient	Std Error	T	P (2 Tail)
Constant	20.452	1.747	11.706	0.000
Previous	-0.328	0.175	-1.873	0.062

Table 8. Relationship between Prior Experience and Opinions about an Elk Hunting Season

Parameter	Estimate	S.E.	T-ratio	P-value
Constant	0.582	0.106	5.497	0.000
Previous	-0.017	0.010	-1.674	0.094

Conclusions

The eco-tourism system tie to the region's elk viewing area is evolving as visitors become familiar with the opportunities offered. There also appears to be an adjustment in the usage patterns. Visitors are learning about the best viewing opportunities and how to avoid crowding. Simultaneously, local services are providing additional opportunities for these visitors. No doubt there will be successes and failures along the way, but the region appears to be developing a stronger tourism infrastructure. There are problems, including a continued lack of lodging places and visitor encroachments on private land. Perhaps the biggest limitation is the concentration of visitors in the relatively short eight-week season centered around the elk rut.

The increase in new visitors suggests that local planners will have to attend to this growth. Furthermore, new visitors may have different desires and expectations than the more traditional elk viewer. They bring in new money and offer new opportunities. They also may have different opinions about the resource. Continued monitoring of the visitors and their needs is recommended as the system continues to evolve.

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