



United States
Department of
Agriculture

Forest
Service

Hoosier
National
Forest

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File Code: 2350
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Date: February 4, 2003

Subject: Estimation of horse and bike trail use for CY 2002

To: File

This memo documents estimation for horse and bike use on trails in the Hoosier National Forest for calendar year 2002. The methodology used has not changed significantly from that used in calendar years 2000 and 2001. That methodology was reviewed by the USDA Forest Service North Central Forest Experiment Station and found to be acceptable. The reader is cautioned that this data is not an accurate count, but rather an estimation from which *general* conclusions may be made about trail use.

Background. Horse and bike riders who ride on Hoosier National Forest trails must buy a daily or annual permit. Sales records could be used as a means to estimate use on an annual basis.

Data needs. Three pieces of information were needed to determine use from trail permit sales records. First, we needed to know how many times annual permit holders used a trail. Second, we needed to know how many people were using the trails without the permit and how many youth riders were using the trail since they are not required to have a permit. Third, we needed to know the percentage of horse and bike users. We already knew how many permits were sold from sales records.

Data collected. During the period January 23, 2001 through December 16, 2002, the forest trail ranger collected data on trail users while she was performing compliance checks for permits. Sample days and locations were not random, but were simply the ranger's patrol schedule which included most weekends (Fri-Sat-Sun), holidays, and some weekdays. Ninety-two patrol days were completed during which time trails were visited 160 times. Data was collected on users observed on the trails. The data collected included the following for each visitor: use type (horse, bike, hike), whether or not they had the required permit, if they were a youth or adult rider, and if they were an annual permit holder how many times did they intend to use it that year. Hikers were observed and their numbers recorded for informational purposes. However, they were not included in the use count estimation because they are not required to purchase a permit.

Methodology. First, to determine use by annual permit holders, we asked willing respondents how many times they expect to ride, obtained an average, and multiplied that by the number of annual permits sold. That figure was then added to the number of daily permits sold which gave the total number of rides by those that purchased a permit. Second, a compliance rate was determined by determining the percentage of those caught riding without a permit, and the total number of rides was adjusted upward to account for them. A correction factor was also determined for youth riders (16 years of age or younger) that were on the trails but were not required to buy a permit. Third, the percentage of



bike and horse use was determined and multiplied by the total number of rides to get breakouts for horse and bike use.

Results. The trail ranger observed 1,068 trail users; 358 were hikers, 100 were bikers, and 610 were horse riders. The ranger checked 710 horse and bike riders for permits; 564 had the required permit, 69 did not, and 77 were youth riders that did not need a permit. Of the adult riders checked, 97 were bikers and 536 were horse riders. Sales amounted to 7,866 daily permits and 1,503 annual permits sold during the year. Ninety horse or bike riders who had an annual permit provided usable feedback on how many times they thought they would use it, and averaged 9.5 rides for the calendar year. Summary tables, a detailed description of the methodology, and the application of the methodology for calendar year 2002 is attached. It was determined that an estimated 27,016 bike and horse rides occurred in calendar year 2002

Trends and Analysis. Overall, estimated use was up 5,578 rides from 2001. This estimate is consistent with the fact that more permits were sold, and users indicated they used the annual permit more often than in past years. Over the past three years, the number of daily permits sold has increased by relatively small increments (2-5%) and the number of annual permits sold has increased at a higher rate (9%). For the second year in a row, the number of bike users observed declined, the number of horse user observed increased, and the number of hikers observed increased (see tables). There is no obvious explanation for the decline in bikers observed. The compliance rate remains high indicating that the overall increasing trend is not a result of more people buying permits to be legal, but rather an actual increase in use. The reader is again cautioned, however, that this methodology does not lend itself to providing accurate use counts.

Recommendations. It is recommended that data collection continue. The data from annual permits holders regarding how many times they ride should be evaluated, and a standard figure adopted if it is determined that enough users have been interviewed to yield a statistically valid adjustment factor. This data is difficult and time consuming for the trail ranger to collect, and should be dropped if not necessary. Forest staff will consult with USDA Forest Service researchers for assistance.

/s/Les Wadzinski
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Recreation Program Manager

TABLES

Table 1 - Total Number of Estimated Rides for All Multiple Use Trails

	2000	2001	2002
Use from daily permits	7,304	7,467	7,866
Estimated use from annual permits	9,187	9,821	14,279
Adjustment for non-compliance	989	2,075	2,436
Adjustment for youth riders	(not counted)	2,075	2,436
TOTAL number of rides	17,480	21,438	27,016

Table 2 - All User Types Observed

User type	2000		2001		2002	
	#	%	#	%	#	%
Hikers	79	11%	216	31%	358	34%
Horse riders	387	55%	398	56%	610	57%
Bikers	240	34%	93	13%	100	9%
Total	706	100%	707	100%	1,068	100%

Table 3 - Horse and Bike Users (adult riders)

User type	2000		2001		2002	
	Est #	%	Est #	%	Est #	%
Horse riders	10,838	62%	16,936	79%	22,964	85%
Bikers	6,642	38%	4,502	21%	4,052	15%
Total	17,480	100%	21,438	100%	27,016	100%

Table 4 - Permit Sales, Compliance Rates, Youth Observed, and Average Times Annual Permit Used

	2000	2001	2002
Daily permits sold	7,304	7,467	7,866
Annual permits sold	1,276	1,364	1,503
Compliance rate	94%	88%	89%
Youth observed	6%	12%	11%
Average times annual permit used	7.2	*	9.5

* Did not obtain useable data

Figures were rounded to the nearest whole number.

Methodology

Terminology. “Ride”: one day of trail use of any time length on a forest trail by a horse or bike rider.

Step 1: determine a multiplier for annual permit holders and add to daily permit sales records

$(\text{total number of expected rides}) / (\text{number annual users checked}) = \text{average number of times each annual permit holder will ride}$

$(\text{average annual permit rides}) \times (\text{number of annual permits sold}) = \text{rides by annual permit holders}$

$(\text{total rides by annual holders}) + (\text{number of daily permits sold}) = \text{number of compliant rides}$

Step 2: adjust for non compliant users and for youth riders who do not need a permit

$(\text{number of non complaint users}) / (\text{number of adult horse \& bike checked}) = \text{non compliance factor}$

$(\text{number of youth riders}) / (\text{number of all horse and bike users checked}) = \text{youth factor}$

$(\text{non compliance factor}) \times (\text{number of compliant rides}) = \text{number of additional rides for non compliance}$

$(\text{youth factor}) \times (\text{number of compliant rides}) = \text{number of additional rides for youth riders}$

$(\text{rides by compliant users}) + (\text{non compliance adjustment}) + (\text{youth adjustment}) = \text{total rides}$

Step 3: Determine mix of horse and bike use

$(\text{number of adult bikers checked}) / (\text{total number of adult users checked}) = \% \text{ bike rides}$

$(\text{number of adult horseriders checked}) / (\text{total number of adult users checked}) = \% \text{ horse rides}$

$(\% \text{ bike rides}) \times (\text{total rides}) = \text{number of bike rides}$

$(\% \text{ horse rides}) \times (\text{total rides}) = \text{number of horse rides}$

Methodology as applied to calendar year 2002

Step 1

$858/90 = 9.5$ average number of rides per annual permit holder

$9.5 \times 1503 = 14279$ rides by annual permit holders

$14279 + 7866 = 22145$ number of rides before adjustment for youth and non-compliance

Step 2

$69/633 = 11\%$ non compliance rate

$.11 \times 22145 = 2436$ additional rides for non compliance

$77/710 = 11\%$ youth rate

$.11 \times 22145 = 2436$ additional rides for youth riders

$22145 + 2436 + 2436 = 27016$ total rides for CY 2002

Step 3

$97/633 = 15\%$ percentage of bike rides

$536/633 = 85\%$ percentage of horse rides

$.15 \times 27016 = 4052$ bike rides

$.85 \times 27016 = 22964$ horse rides

Figures were rounded to the nearest whole number.