INCREASE IN BEAVER IMPOUNDED WATER IN MISSISSIPPI OVER A TEN YEAR PERIOD

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Abstract: An inventory of beaver (*Castor canadensis*) impounded water 0.4 ha and greater in area in Mississippi was conducted using the same technique as a survey made a decade earlier. The data revealed almost a 300% increase of beaver impounded areas. The increase indicates a probable yearly increase of impoundments of 11.5% per year.

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Complaints of beaver damage from landowners have been increasing steadily in Mississippi and most of the southeastern states (Arner 1964). Landowners became so vocal in their complaints in 1964 that the Mississippi legislature provided funds for bounty payments. In 1966 a state-wide beaver inventory was initiated to determine the number of beaver impoundments 0.4 ha and larger in area (Arner et al. 1969).

In order to determine the present status of beaver activity one decade after the first inventory, another survey was initiated.

PROCEDURES

The procedures for locating and estimating the area of beaver ponds were identical to those of Arner et al. (1969). This technique involved sending a county road map with a scale of one-half inch to the mile to each Soil Conservation Service work unit and one to each county agent. A letter accompanied the maps which explained the reason for the inventory and requested that all beaver ponds 0.4 ha or larger in area be located on the maps with a listing of the landowner's name and address and an estimate of the area of each pond. After the maps and accompanying information was returned to the Department of Wildlife and Fisheries the information was transferred to a single map for each county. These maps were then sent to the county forester to obtain beaver pond information that might have been unreported by the Soil Conservation Service and the county agents.

In order to ascertain the accuracy of the beaver pond areas reported, beaver ponds in 5 north Mississippi counties were measured with a dot grid overlay on aerial photographs. Thirty-four ponds larger than 2.0 ha were sampled in this manner. These ponds represented about 40% of the beaver impoundments in the sample counties. This area was selected for sampling since it contained a large number of beaver ponds and aerial photographs of recent origin were available. These data were analyzed to determine if a statistically significant correlation existed between the acreage estimated by the cooperating agencies and that ascertained by the investigators from aerial photographs. The correlation coefficient used was according to Steel and Torrie (1960).

RESULTS AND DISCUSSION

The cooperating agencies in 1976-77 reported a state-wide total of 2,739 beaver ponds (0.4 ha or larger in area) encompassing a total of 28,769 ha. In 1966-67 there were 956 beaver ponds encompassing 9,469 ha. From these data it appears that within this 10 year span, there was an increase of beaver impoundments of nearly 300% which indicates a yearly increase of about 11.5%. During the 1977-78 survey, a significant correlation coefficient of $r = 0.86$ ($p < 0.05$) was found between pond size estimates given by the cooperating agencies and the area estimates determined by field sampling. The correlation coefficient obtained during the 1966-67 survey was $r = 0.77$ ($p < 0.05$). It is

probable that the high correlation coefficient was due to the availability of aerial photographs of recent coverage to cooperating agencies.

The largest increase in the number of beaver ponds was found in the Mississippi Delta counties followed by counties in the Loess area. The Interior Flatwoods had the greatest percentage increase in beaver pond areas with the Loess area second in pond area increase (Table 1). The Delta physiographic area is extensively farmed with relatively small acreages of woodland. The terrain in the Loess area is relatively hilly, while the Interior Flatwoods is an area of acid soils with poor drainage and is largely forested.

Table 1. Comparison of changes in number and area of beaver ponds reported within a ten year period in Mississippi, 1966-1976.

Land Resource	No. Ponds Reported		%	Total estimated hectares		%
Area	*1966-67*	*1976-77*	*Change*	*1966-67*	*1976-77*	*Change*
Delta	62	381	615	970	6,812	702
Loess	239	642	269	913	7,178	786
Upper Coastal Plain	364	809	222	6,519	9,212	141
Lower Coastal Plain	235	620	264	788	2,661	338
Blacklands	38	205	539	162	1,843	114
Interior Flatwoods	18	82	456	117	1,062	909
Totals	956	2,739		9,469	28,768	

The area of water impounded by beaver has increased by 100% or more in 54 of the 82 counties in the state (Fig. 1). Beaver activity is indicative of increasing beaver populations. These increases have taken place despite the removal of restrictions on taking beaver as well as the paying of bounty on beaver killed. Since 1974, $175,830.00 has been paid as beaver bounty in Mississippi. A mail survey made for Mississippi in 1976-77 showed that the total beaver take in the state was only 18,071 (Guynn et al. 1978). When this harvest is compared with the extensive area of beaver impounded water, it is evident that the beaver population is underharvested. There will have to be substantial monetary increases in beaver pelts before significant reduction in Mississippi beaver populations occurs.

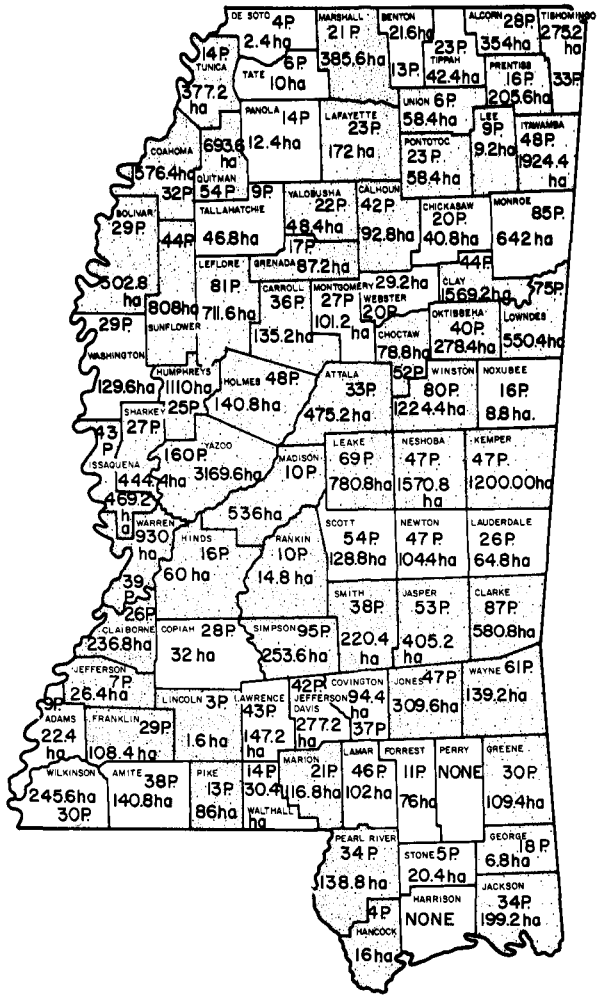

Fig. 1. Number of beaver ponds and hectares in each county as reported by cooperating agencies for 1976-1977. The counties showing 100 percent or more increase in area are indicated by shading.

Legend: P - Ponds ha - Hectares

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