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West Central District

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A STUDY OF THE MOVEMENT AND HARVEST OF CATFISH TAGGED
IN THE LOWER TREMPPEALEAU RIVER AND TREMPPEALEAU BAY

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Introduction

In past years, concentrations of catfish in Trempealeau Bay have been observed by Department personnel while supervising commercial contract seining operations and conducting electrofishing surveys. Catfish from the lower Trempealeau River and Trempealeau Bay were tagged and released to determine whether this unusual concentration was a distinct population restricted to the lower Trempealeau River system although the Mississippi River was freely accessible. Since the tagged catfish were a sample of a larger population, the rate and direction of movement could be generally determined from tag returns.

Methods

A total of 452 channel catfish and 12 flathead catfish were captured, measured, tagged, and released between April 25 and June 30, 1967 (Figure 1). These fish were taken from Trempealeau Bay and the lower Trempealeau River between Mississippi River, Pool 6, and the Highway 35-54 bridge (Tables 1 and 2, Figure 2). Approximately one-fourth of the tagged fish were taken from Trempealeau Bay by contract seining. The remainder were obtained through netting and electrofishing by the Department in the Trempealeau River above Trempealeau Bay. Sizes ranged from 8.7 to 40.0 inches in length (average length, 15.9 inches). The catfish were tagged by passing a type 302 stainless steel wire through the back of the fish under the dorsal spine. A numbered plastic disc-dangler tag was attached to the wire (Figure 3). The numbered tag offered a \$1.00 reward for its return to the Wisconsin Conservation Department office at La Crosse. Information on the method of recapture, fishing location, date of recapture, and size of the catfish was also requested. The study was publicized through radio and television broadcasts, newspaper articles, and posters at fish markets and boat landings. Persons likely to observe tagged catfish including fishing barge operators, commercial fishermen, creel census clerks, sportsmen's club members, bait shop operators, and conservation wardens were informed of the study individually by personal contacts.

Results

A total of 84 tagged channel catfish were recaptured and reported over the five year period 1967 through 1971. This represents 18.5 percent of the 453 tagged channel catfish which were released (one tagged channel catfish was not measured). The returns were examined with respect to date of recapture, location, seasonal distribution, and method of recapture. None of the tagged flathead catfish were recaptured.

The annual rate of recapture was 7.7 percent in 1967, 6.7 percent in 1968, 2.3 percent in 1969, and 1.6 percent in both 1970 and 1971. These rates were calculated without regard for mortality other than fishing. The first year produced 43 percent of the returns, the second year produced 32 percent, the third year produced 11 percent, and the fourth and fifth years produced 7 percent each.

FIGURE 1. LENGTH FREQUENCY OF 452 CHANNEL CATFISH AND 12 FLATHEAD CATFISH TAGGED IN TREMPLEAU BAY AND THE LOWER TREMPLEAU RIVER BELOW HIGHWAY 35-54 BETWEEN APRIL 25, 1967 AND JUNE 30, 1967.

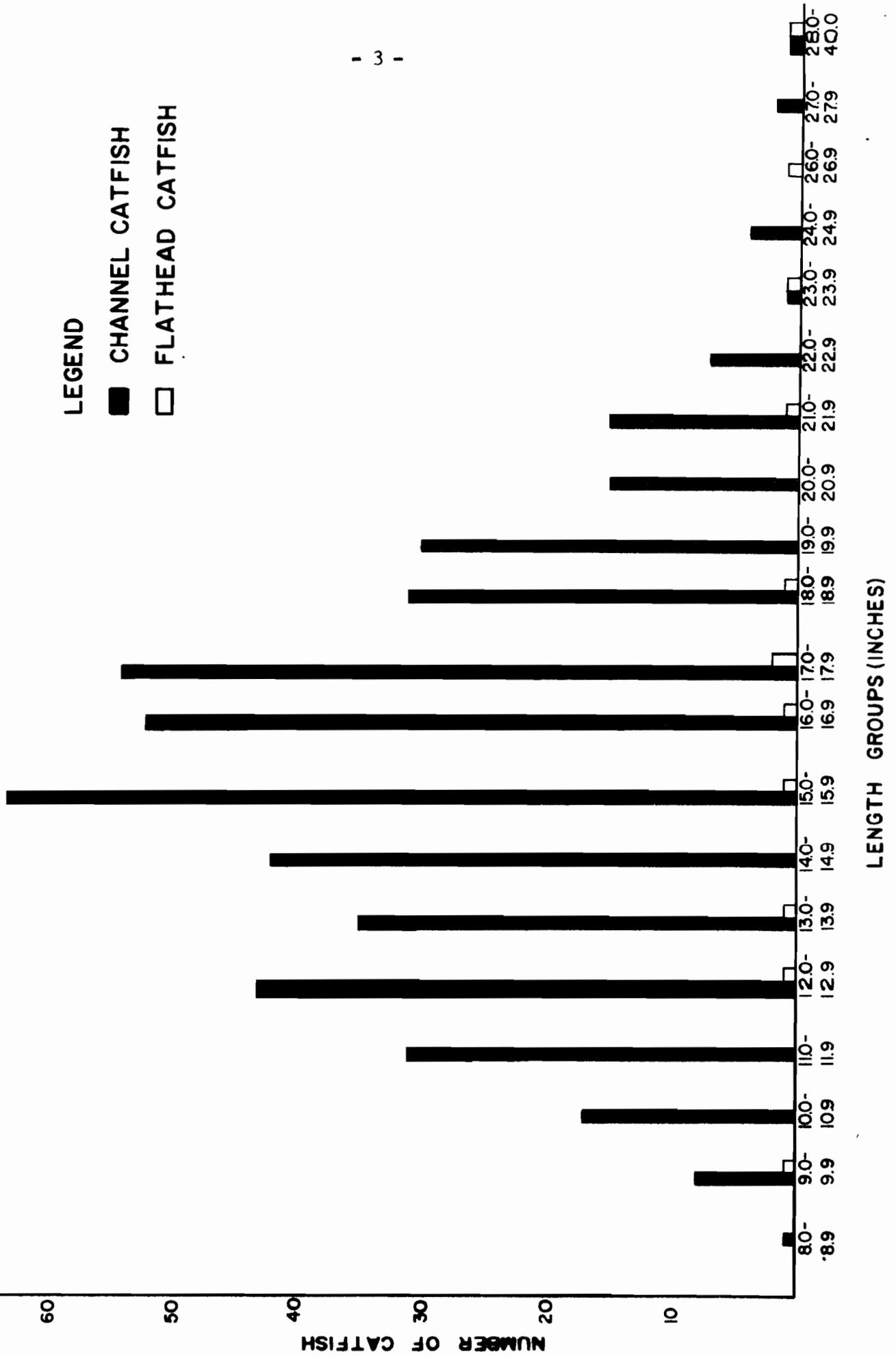


Table 1.

CAPTURE LOCATION AND GEAR USED TO OBTAIN CHANNEL CATFISH
DURING THE TAGGING PERIOD OF APRIL 25 TO JUNE 30, 1967

	Seine	Buffalo Net	Bait Net	Slat Net	Shocker*	All Gear Combined
Trempealeau River						
Near Federal Bridge	-	5	-	5	-	10
Above Federal Bridge	-	47	-	34	-	81
Below Federal Bridge	-	105	2	70	-	177
Big Bend	-	-	-	-	5	5
Old River Channel	-	2	-	1	11	14
Split in Old River Channel	-	14	-	1	-	15
Delta Locks	-	-	-	11	-	11
Highway Bridge to Trempealeau Bay	-	-	-	-	27	27
Trempealeau River Total						
	-	173	2	122	43	340
Trempealeau Bay Total						
	113	-	-	-	-	113
All Locations combined						
	113	173	2	122	43	453

* All catfish taken with shocker released in Trempealeau Bay.

Table 2.

CAPTURE LOCATION AND GEAR USED TO OBTAIN FLATHEAD CATFISH
DURING THE TAGGING PERIOD OF APRIL 25 TO JUNE 30, 1967

	Buffalo Net	Slat Net	All Gear Combined
Trempealeau River			
Near Federal Bridge	1	-	1
Above Federal Bridge	2	-	2
Below Federal Bridge	4	4	8
Old River Channel	1	-	1
<hr/>			
Trempealeau River Total	8	4	12

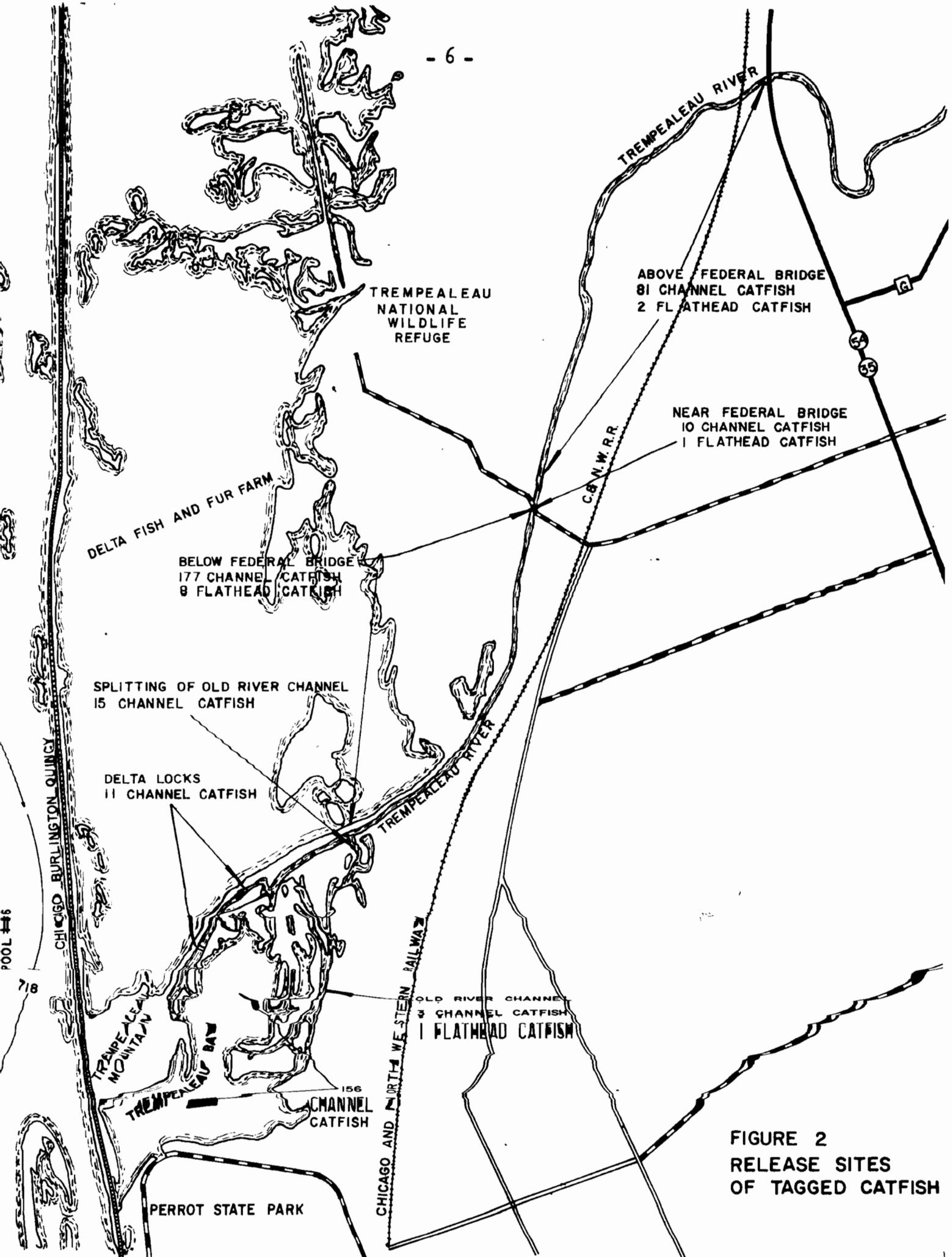
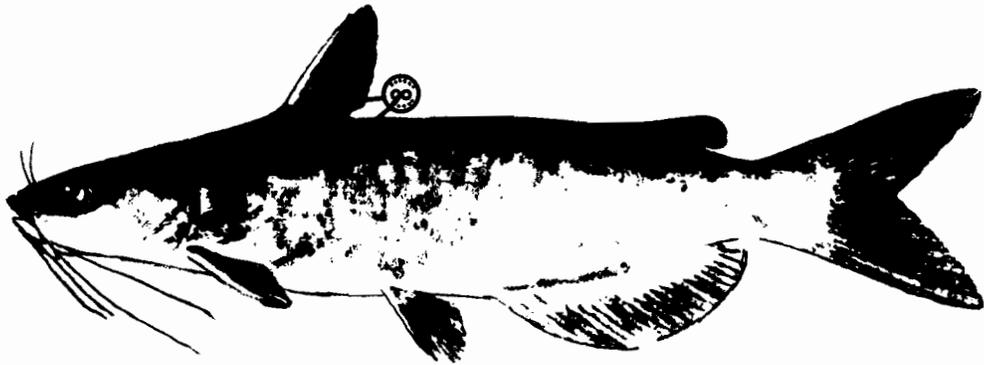
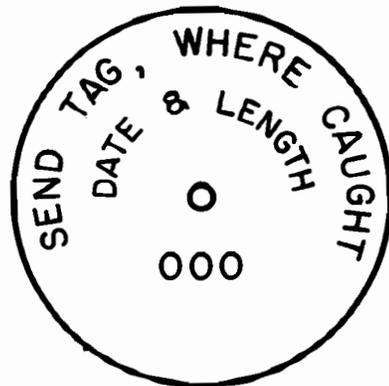


FIGURE 2
RELEASE SITES
OF TAGGED CATFISH



FRONT



BACK

AN ILLUSTRATION SHOWING METHOD OF TAGGING
AND TAG USED

FIGURE 3

The returns were grouped into areas and located on maps (Table 3 and Figures 4, 5, and 6). The largest number of recaptures, just under half, were taken from the Mississippi River, Pool 6, adjacent to the tagging area. The tagging area itself had the second largest number of recaptures, slightly over one-fourth of the total. The tagging area can be further subdivided into an upper section, the lower Trempealeau River from the Highway 35-53 bridge downstream to Trempealeau Bay, and a lower section, Trempealeau Bay downstream to Pool 6. Each section produced about half of the returns from the tagging area.

The remainder of the tag returns came from the following locations which are listed in order of decreasing number of recaptures: Mississippi River pools downstream from Pool 6 (12 percent), Trempealeau River above the tagging area (10 percent), and the Black and Chippewa Rivers (2 percent). Over half of the total number of tag returns (59 percent) came from Pool 6 and the tagging area during the first two years of the study. Expressed in terms of actual distance, 89 percent of the recaptures were taken within 13 miles of their release point. The remaining 11 percent were caught from 20 to 115 miles away from where they were released. The average distance between release and capture points was 54 miles for catfish traveling 20 or more miles.

Seasonally, tagged catfish were caught mainly in late summer (55 percent in August and September) and late spring (19 percent in May) (Table 4). In the last two years of the study, most of the returns came in spring (75 percent in April and May). By location, the bulk of the tag returns from the tagging area came in August and September (Table 5). Most of the recaptures reported from the Mississippi River pools below Pool 6 were caught in May and June.

Commercial fishing accounted for 60 percent of the tag returns and sport fishing accounted for 40 percent. The bulk of the commercial fishing returns came from setlines (72 percent) followed by seining (24 percent) (Table 6). Tag returns from commercial fishing outnumbered sport fishing returns for the first and last two years of the study. Tag returns from anglers exceeded commercial returns in 1968 and 1969. Approximately three-fourths of the commercial returns and sport returns came during the first two years of the study. The fishing method which produced returns varied with location (Table 7). Within the tagging area commercial seining accounted for slightly over half the returns and sport fishing accounted for the remainder. Setlines produced most of the returns from the Mississippi River (69 percent of the Pool 6 returns and 70 percent of the returns from lower pools). The remaining Pool 6 returns came from sport fishing. Single returns from a bait net, a basket trap, and an angler accounted for the rest of the tag returns from the lower pools. There was a single setline return from the Black River and a sport fishing return from the Chippewa River. All of the Upper Trempealeau River returns came from anglers. August and September each contributed 35 percent of the sport fishing returns followed by July with 18 percent (Table 8). May and August produced the largest number of commercial returns (30 and 26 percent respectively) followed by September (18 percent).

Table 3.

CHANNEL CATFISH RECAPTURES BY LOCATION AND YEAR

LOCATION	YEAR					Total
	1967	1968	1969	1970	1971	
Lower Trempealeau River and Trempealeau Bay - 6 miles or less from point of release	9	7	3	2	3	24
Pool 6 - 13 miles or less from point of release	22	13	3	-	1	39
Trempealeau River above Tagging Area - 2 to 38 miles from point of release	2	4	1	-	1	8
Black and Chippewa Rivers - 21 to 84 miles from point of release	-	1	-	1	-	2
Pools 7, 8, 9, and 11 - (3 to 115 miles from point of release)	2	3	2	3	1	11
Within 13 miles of Point of Release	33	26	6	5	5	75
Over 13 miles from Point of Release	2	2	3	1	1	9
Total	35	28	9	6	6	84

LOCATION OF CHANNEL CATFISH TAG RETURNS

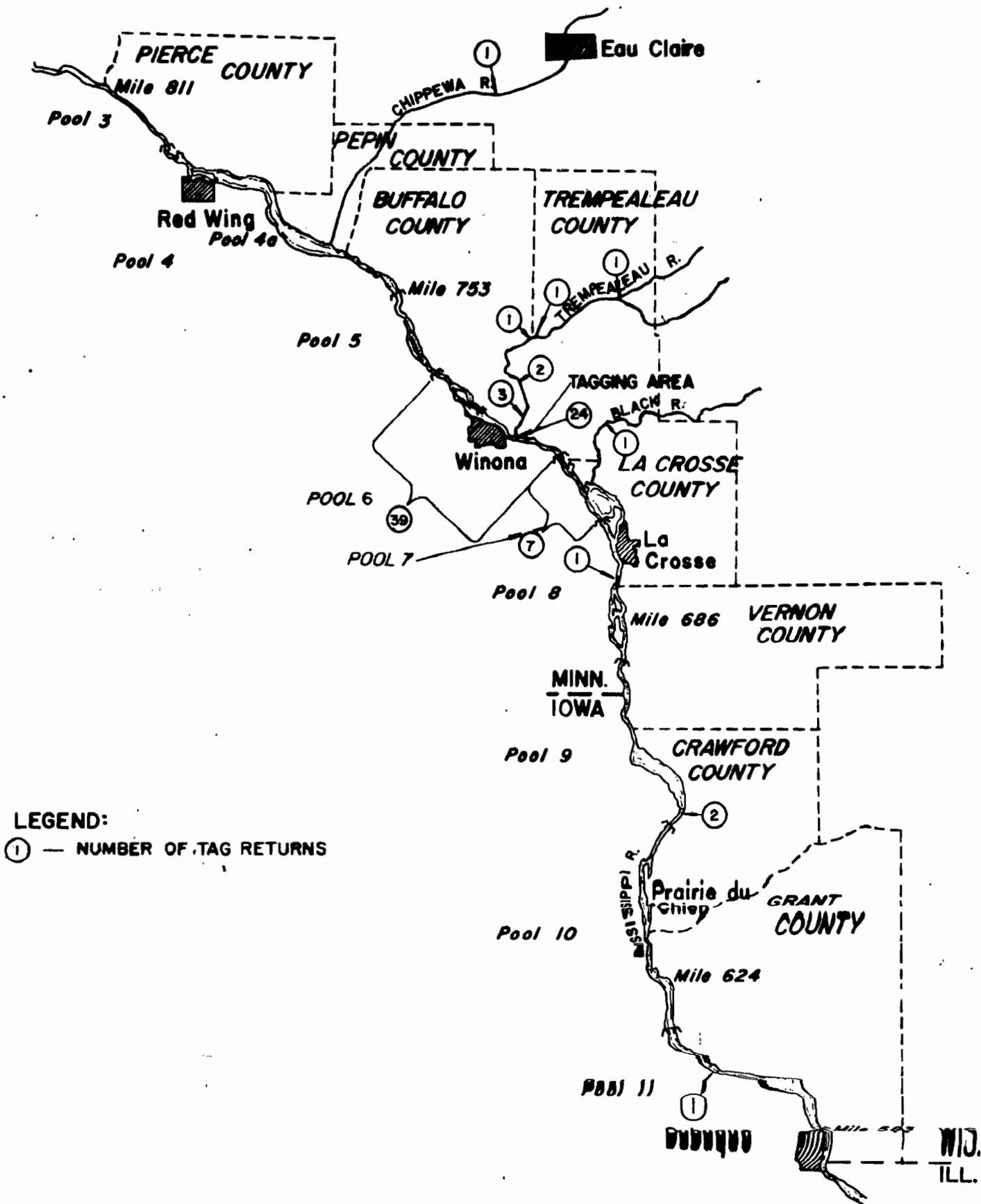


FIGURE 4

LEGEND

- 1 CATFISH TAG RETURN
- 5 CATFISH TAG RETURNS

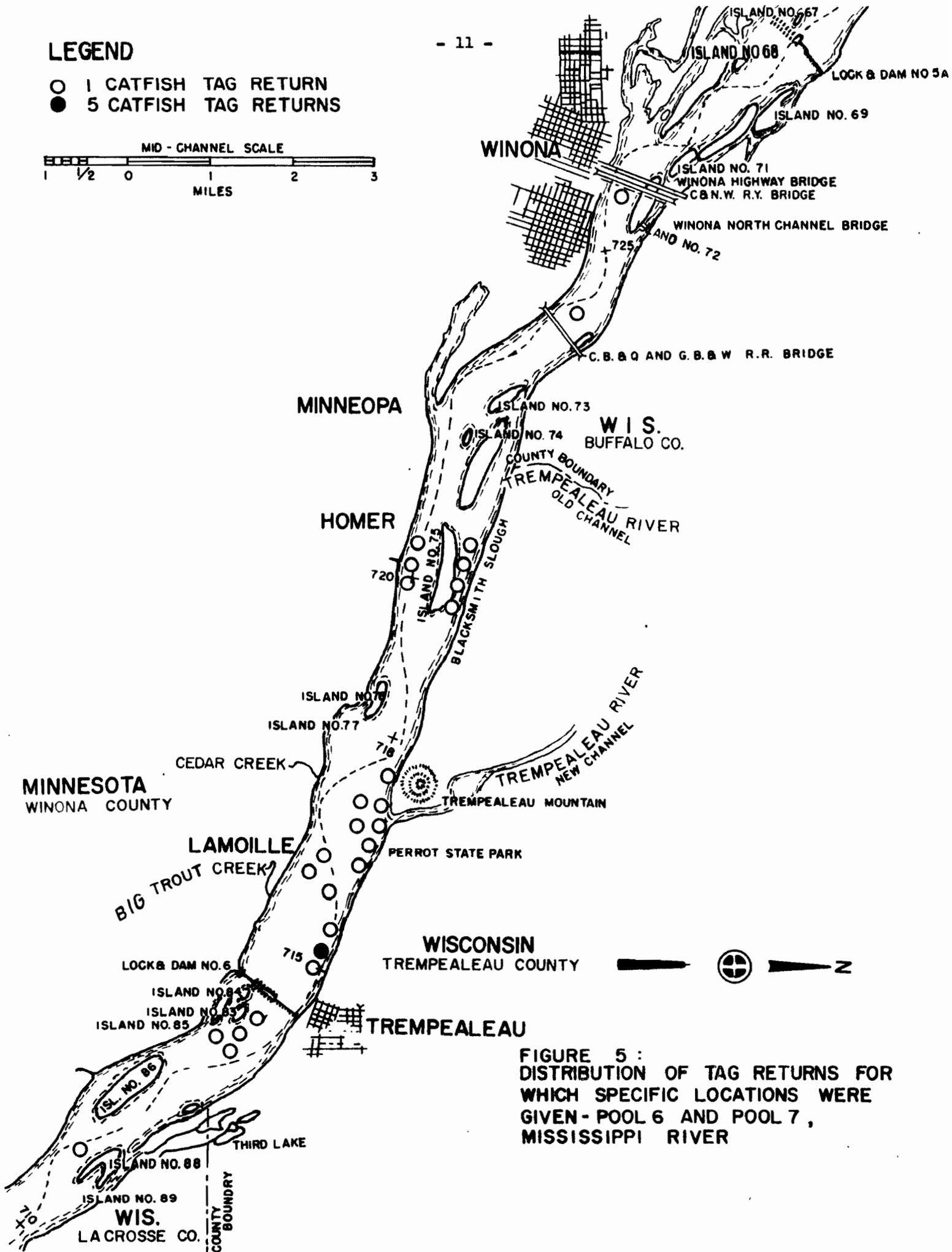


FIGURE 5 :
DISTRIBUTION OF TAG RETURNS FOR
WHICH SPECIFIC LOCATIONS WERE
GIVEN - POOL 6 AND POOL 7 ,
MISSISSIPPI RIVER

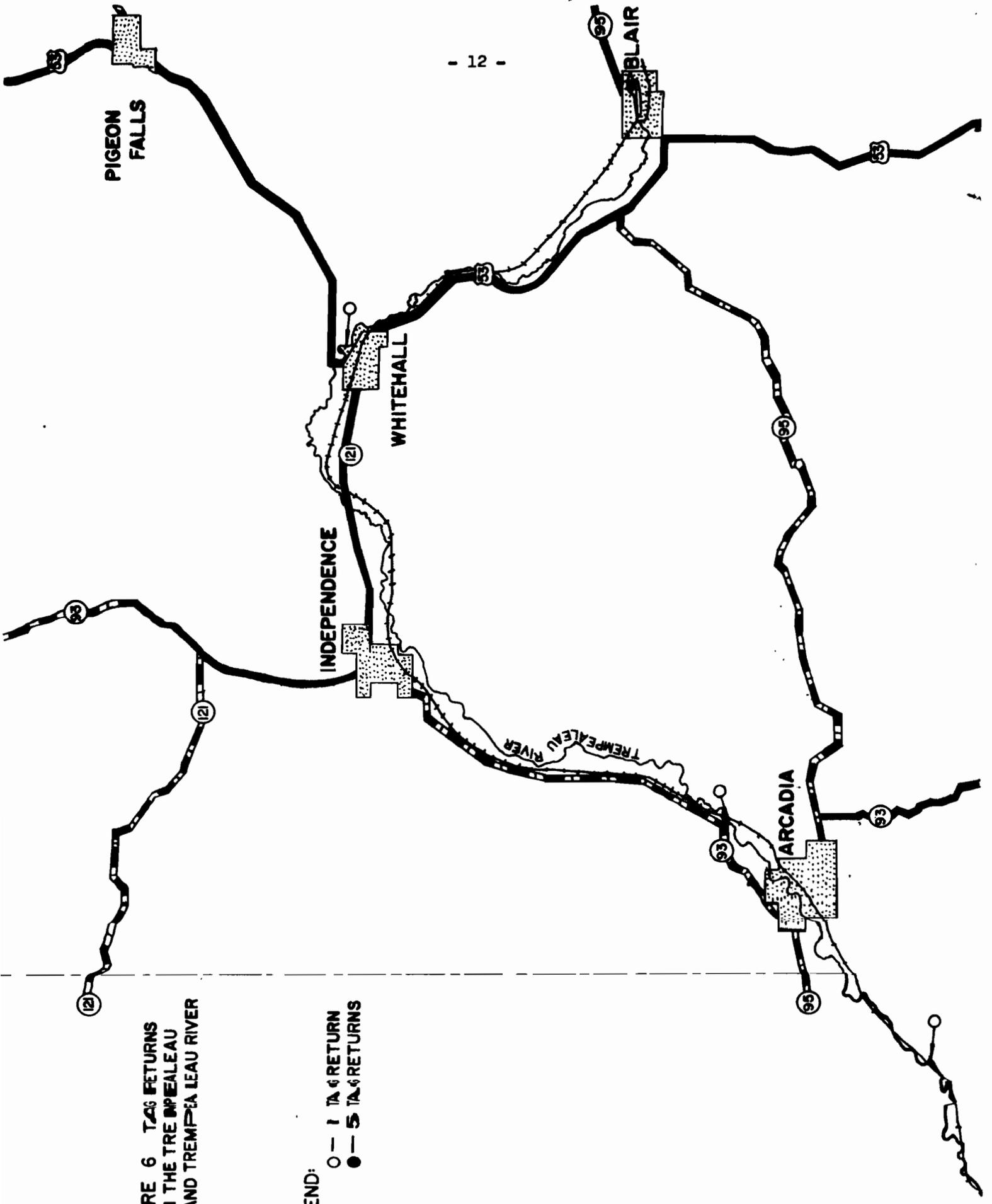


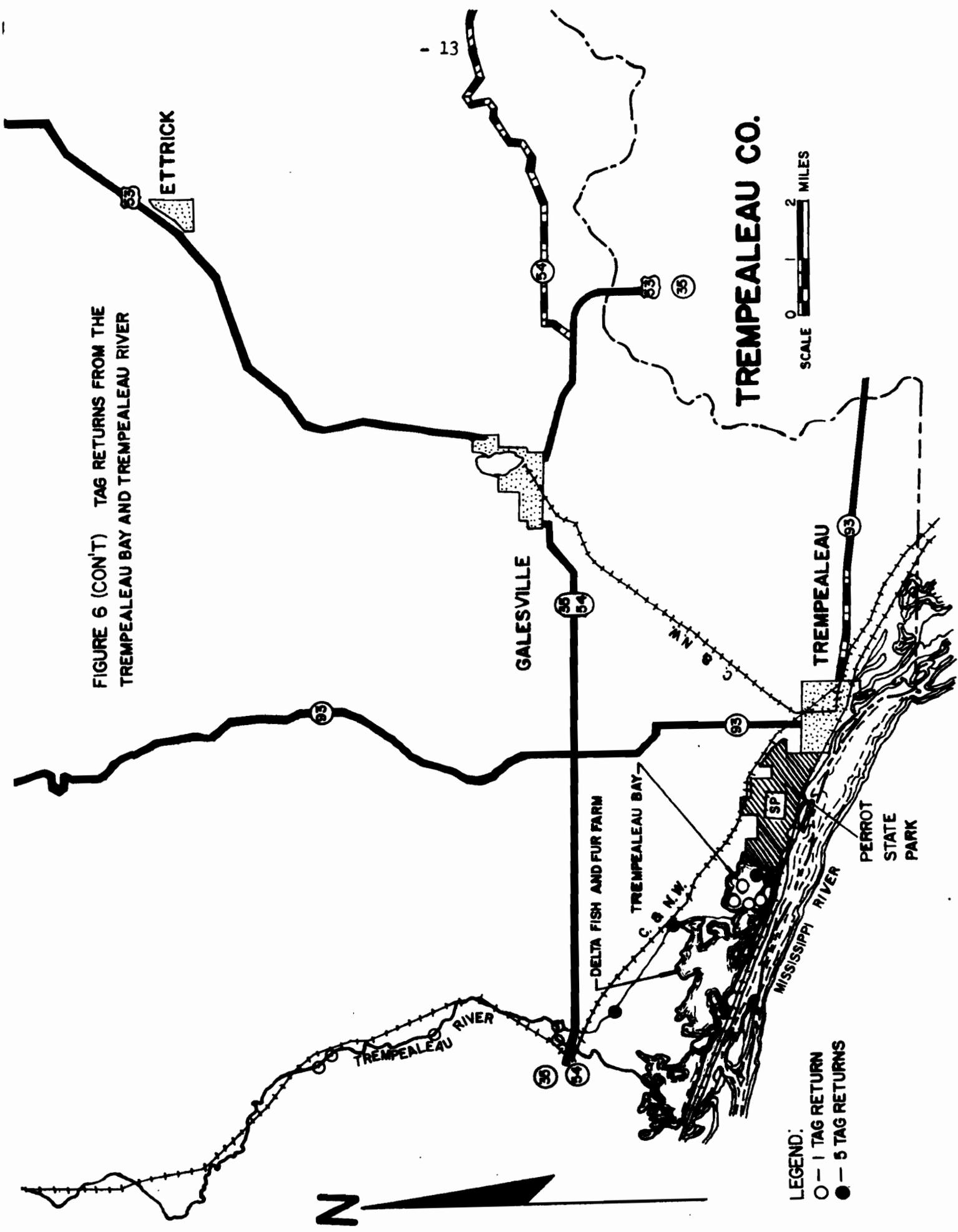
FIGURE 6 T40 RETURNS FROM THE TREMPALEAU BAY AND TREMPALEAU RIVER

LEGEND:

- - 1 T40 RETURN
- - 5 T40 RETURNS



FIGURE 6 (CON'T) TAG RETURNS FROM THE TREMPEALEAU BAY AND TREMPEALEAU RIVER



LEGEND:
 ○ — 1 TAG RETURN
 ● — 5 TAG RETURNS

SCALE 0 1 2 MILES

TREMPEALEAU CO.

Table 4.

CHANNEL CATFISH RECAPTURES BY MONTH AND YEAR

MONTH	YEAR					Total
	1967	1968	1969	1970	1971	
April	-	-	-	-	3	3
May	3	7	-	4	2	16
June	2	3	2	1	1	9
July	2	4	1	-	-	7
August	14	9	2	-	-	25
September	12	5	4	-	-	21
October	2	-	-	1	-	3
Total	35	28	9	6	6	84

Table 5.

CHANNEL CATFISH RECAPTURES BY LOCATION AND MONTH

LOCATION	MONTH (All Years)							Total
	April	May	June	July	August	September	October	
Lower Trempealeau River and Trempealeau Bay - 6 miles or less from point of release	3	3	1	4	2	11	-	24
Pool 6 - 13 miles or less from point of release	-	8	3	-	17	9	2	39
Trempealeau River Above Tagging Area - 2 to 38 miles from point of release	-	-	2	1	4	1	-	8
Black and Chippewa Rivers - 21 to 84 miles from point of release	-	1	-	-	1	-	-	2
Pools 7, 8, 9, and 11-(3 to 15 miles from point of release)	-	4	3	2	1	-	1	11
Within 13 miles of point of release	3	14	5	5	24	21	3	75
Over 13 miles from point of release	-	2	4	2	1	-	-	9
Total	3	16	9	7	25	21	3	84

Table 6.

CHANNEL CATFISH RECAPTURES BY GEAR AND YEAR

GEAR	YEAR					Total
	1967	1968	1969	1970	1971	
Setline	20	10	1	4	1	36
Seine	6	1	-	2	3	12
Basket Trap	-	-	1	-	-	1
Bait Net	-	1	-	-	-	1
Sport Catch	9	16	7	-	2	34
Total - All Gear	35	28	9	6	6	84

Table 7.

CHANNEL CATFISH RECAPTURES BY LOCATION AND GEAR

LOCATION	GEAR					Total
	Setline	Seine	Basket Trap	Bait Net	Sport	
Lower Trempealeau River and Trempealeau Bay - 6 miles or less from point of release	-	12	-	-	12	24
Pool 6 - 13 miles or less from point of release	27	-	-	-	12	39
Trempealeau River above Tagging Area - 2 to 38 miles from point of release	-	-	-	-	8	8
Black and Chippewa Rivers - 21 to 84 miles from point of release	1	-	-	-	1	2
Pools 7, 8, 9, and 11 - (3 to 115 miles from point of release	8	-	1	1	1	11
Within 13 miles of Point of Release	33	12	-	-	30	75
Over 13 miles from Point of Release	3	-	1	1	4	9
Total	36	12	1	1	34	84

Table 8.

CHANNEL CATFISH RECAPTURES BY MONTH AND GEAR

MONTH	GEAR					
	Setline	Seine	Basket Trap	Bait Net	Sport	Total
April	-	3	-	-	-	3
May	11	3	-	1	1	16
June	6	-	-	-	3	9
July	-	-	1	-	6	7
August	13	-	-	-	12	25
September	3	6	-	-	12	21
October	3	-	-	-	-	3
Total	36	12	1	1	34	84

Discussion and Conclusions

The distribution of tag returns indicates that catfish inhabiting Trempealeau Bay and the Lower Trempealeau River in spring and early summer are not confined exclusively to this area. A considerable number apparently move out into Pool 6 of the Mississippi River and some continue considerably farther upstream and downstream. Others migrated up the Trempealeau River for considerable distances.

In evaluating fish movement from tag returns, it is important to bear in mind that the distance between the release site and the point of recapture represents the minimum distance that a fish travelled. For example, a fish recaptured in the same area in which it was released may have been in one or more other areas before it was recaptured.

The amount of time that tagged fish occupied various areas will be reflected in the distribution of the tag returns only if the catch rates are comparable at different times. For example, seasonal movements may bring catfish into an area for a brief period during which they are highly susceptible to a particular fishery. Conversely, it is possible that these fish could spend a large amount of time in an area where the harvest rate is very low. Therefore, the number of tag returns from an area may represent the availability of the catfish to the fishery rather than the amount of time spent in a particular area.

The number of tag returns from a given location is also affected by the number of tagged and untagged fish and the rate of harvest. If an area has a larger number of tagged fish relative to the number of unmarked fish or a higher harvest rate, it may appear to have more tagged fish than it actually contained.

If catch rates were seasonally uniform, high numbers of returns from different areas during noncorresponding seasons may indicate fish movement between them. No such trends were evident in this study as most tag returns came in late summer from the tagging area, Pool 6, and the Upper Trempealeau River. Considering the distances involved, spring returns from lower pools probably reflect emigration rather than a seasonal travel cycle. This distribution of returns does not preclude seasonal influence on the catfish movements observed, but probably reflects an increase in the catch rate of fisheries in the three areas during late summer.

The rate of tag returns indicates a low rate of harvest for catfish found in the Trempealeau Bay and Lower Trempealeau River in spring and early summer. Several factors may have contributed to the decline in annual rate of recaptures: 1) a decrease in the catch from areas where tagged fish were found resulting from poor fishing conditions or decreased fishing pressure; 2) mortality from causes other than fishing; 3) loss of tags; 4) a decrease in the ratio of tagged to untagged fish in a given area resulting from dispersal movements away from the release site and recruitment of new fish through reproduction and growth. Both dispersal and recruitment tend to lower the number of marked fish being harvested.

The decline in tag returns between the first and second year was small compared to that between 1968 and 1969. A contributing factor could be that the release of tagged fish took place during May and June of 1967, so all of the tagged fish were not available to the fisheries during these two months. This would tend to decrease the number of returns for 1967 and lessen the difference between the returns for 1967 and 1968. The number of sport fishing returns in 1968 was higher than 1967 and counteracted the decline in commercial fishing returns in 1968. This may have been due to an increase in the sport catch. The drastic decline between the number of 1968 and 1969 returns may have resulted from a continuing decline in the Pool 6 setline harvest and a very small seine catch of catfish in the tagging area.

Summary

The recapture of a tagged sample of a catfish concentration commonly observed in Trempealeau Bay and the Lower Trempealeau River in spring and early summer indicates these fish migrate out of the tagging area and into the adjacent Upper Trempealeau and Mississippi Rivers to a considerable extent. To determine if reciprocal movement into the tagging area occurs, it would be necessary to tag and release catfish in adjacent waters as well. However, it appears that some interchange of catfish between the above areas is more likely than the existence of completely isolated populations.

In general, the total exploitation rate of the catfish fishery under study is quite low assuming that the loss of tags and mortality from causes other than fishing was not significant during the study period. The harvest of the group of catfish came mainly in the first two years from the tagging area and Pool 6 of the Mississippi River during the months of August, September, and May through setlining and sport fishing.

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