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INSTITUTE FOR FISHERIES RESEARCH
DIVISION OF FISHERIES
MICHIGAN DEPARTMENT OF CONSERVATION
COOPERATING WITH THE
UNIVERSITY OF MICHIGAN

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Report 226

MEMORANDUM REGARDING MAPS USEFUL FOR FISHERY RESEARCH PURPOSES

In response to the request for comments or suggestions on the program of preparing better maps for fishery purposes, as stated in Director Hogarth's Memorandum of August 17 and the Fish Division's Memorandum of August 25, we beg to submit the following:

RE "ALL-STATE PLAT-BOOK"

We agree thoroughly with the statements in the August 17 memorandum. The C.C.C. work of this year along lake and stream improvement lines, especially following the new development of improving waters upon petition of riparian owners, ought to make the need for an "all-state plat-book" sufficiently evident.

For such purposes a ½ inch per mile scale would seem wholly insufficient, in order to give room to show in detail:

(1) The boundaries of smaller "dedicated tracts".

(2) Indication of lakes and streams on which survey data are available.

(3) Indication of where and when lake and stream improvement work of given sorts has been installed (this obviously important point was not mentioned in the memorandum).

(4) Reference to fish planting records (actual year by year planting records would be wholly out of the question for any map of reasonable size, as many very small lakes and streams have been planted dozens of times and will continue to be planted regularly. Perhaps some set of symbols to indicate sort of fish planted, intensity of plantings and on what basis planted,

could be devised as a compromise, but even this would require a rather large scale map,--and a large amount of labor).

(5) Indication of what areas are signed up for lake and stream improvement work in the future (preferably by some color shading or symbols easily changed to indicate work completed as this is accomplished).

A fair scale would also be needed to allow for corrections and additions to be readily made.

No doubt land features (natural and cultural) which could advantageously be included on the same map would need space for numerous entries.

Considering fish needs only, but looking forward a few years, we believe that a scale of 1 inch per mile would be the very minimum. A 2-inch scale would be better.

The more numerous the maps, certainly the greater would be the difficulty in enterring the data. Much repetition and extra labor would be required if the plat-books were by townships.

We would suggest that the L.E.S. base maps be used so far as available for the "plat book", and that maps to a 2" scale be drawn up for counties not covered by the L.E.S.

We assume crayon colors would be used on the plat-book maps and that these would not be blueprinted. For use in the field and by the public, County Conservation Maps would be in order. Field men checking on property lines, etc., could enter onto copies of the Conservation Maps such data as are pertinent.

RE "UNIFORM BASE COUNTY MAPS"

As indicated in previous discussions, the Institute appreciates keenly the general need for a set of county maps showing conservation features as accurately as possible.

For the fish work, both field and office, the county seems to be the practicable unit. For use in headquarters, hatcheries, the central office, etc., these if prepared uniformly could be trimmed and mounted together into Districts (or parts of districts) as desired. In this connection it should be remembered that the District boundaries have been changed several times.

These county maps should be additional to the units of the proposed Plat-Book. They would not carry confidential data such as stream or lake areas definitely projected for improvement. For convenience in field work they should be on a smaller scale. The plat-book, we take it, would be primarily a graphical representation of and index to Departmental activities. The county conservation maps, quite as vitally needed, would then be more in the nature of field and reference guides, not only by the Department but also by the public as well.

Following the numbered items of the Fish Division's Memorandum of August 25:

(1) A Blueprint (blue line) form is certainly called for, because it will take several years to compile the important data with sufficient accuracy and completeness to call for printed maps. On the other hand, it would seem advisable to look forward to printing such maps after a number of years.

(2) In our opinion a scale of $\frac{1}{2}$ inch per mile is too small to show all water data satisfactorily. It would suffice in some areas but not in others. Accuracy and completeness is especially desirable in plotting and naming the smaller lakes and feeders, of which there are often several per section. A scale of 2 inches per mile makes a map decidedly too large for convenient field use. To meet conflicting interests, a scale of 3/4 inch per mile is urged.

(3a) Agree

(3b) Larger and (apparently) more permanent beaver dams could also be indicated by suitable symbol to advantage. Dams on minor streams are also important.

The greatest possible accuracy and completeness is important for fish purposes, especially as regards the location and naming of the smaller lakes and streams. When names are not locally applied to small waters, it would be desirable to coin names or to induce local residents to do so.

(3c) Airports would seem one of the items that could be eliminated without loss, or at most indicated by a small symbol.

(3d) By all means section lines should be included as well as town lines. The section lines if dotted would be inconspicuous and easily distinguished from streams, roads, etc. To avoid confusion with streams, roads and trails should all be doubtled-lined. To catch the eye, to show up drainage systems, and to emphasize the larger streams, the streams should be indicated by carefully shaded lines. The widths of the medium-sized streams could be considerably exaggerated to advantage for the same reasons. All but very large rivers ought to be solid-lined, so as to easily avoid confusion with sand trails.

(3e) Rearing stations and fire towers would naturally be included. We would also suggest bounding the larger club grounds, as Turtle Lake, Huron Mountain, etc.

(4) Title or other part of map should include statement by whom and when prepared, and date to which corrected.

Careful consideration should be given to the indication of kinds of fish and game predominate in different waters and different land areas. This would seem feasible if a 3/4 inch scale is used (see accompanying sketch). Appropriate two-letter abbreviations with a key on each map ought to serve this purpose. Symbols of (say) St scattered along brook trout streams would not be confusing; similarly Rt for rainbows, Bt for brown trout, or Bt and St alternating, etc. On the land Dr for deer, Gr fro grouse, etc. On or opposite the lakes the same sort of symbols for Bs (bass), Pk (pike), Pe (perch), etc., could be given, listing of course only one or a few predominant species. On marshes and lakes, Du for ducks, etc.

The mapwork on the Kalkaska Recreational Map might well be taken as a model for the County Conservation Maps. The colors on that map of course enhance its appearance and usefulness, but are not necessary. The red shows only the lake routes and the game; the former would be omitted; the latter

could be indicated by the scattered abbreviations. The blue for the lakes and larger rivers is decidedly helpful, but not necessary. The lakes could be colored on office copies. Some scheme should be adopted to emphasize the lakes in the drafting of the maps, as it is extremely difficult to pick out the lakes if represented only by a simple line margin. Contour lining is laborious, often sloppy in appearance as on some of the Highway County Maps, and inconvenient in preventing names or symbols from being printed within the lake boundaries. We suggest that the lakes be emphasized by drawing in a conventional shoal area uniformly about 1 mm. broad. This would be easily done with ruling pen, leaves the detail of shore outline clear and makes the lakes stand out sharply (see attached sketch).

It would obviously not be practicable to have the printing as small or as nearly perfect as on the Kalkaska map, as contact printing without reduction will supposedly be used. However it would be advantageous on the Conservation Maps to have the lakes and streams, especially the important ones, in bolder printing. With care, the printing could be made smaller than on the Highway blueprint maps, especially for the minor creeks and ponds (see accompanying sketch).

We would suggest that schools and churches be indicated by symbol but without name. Use of symbols for camp sites and scenic views would seem possible without unduly cluttering the map.

RE STATE FISH MAP

Such a map of the state in unit or in section, as suggested in the Fish Division's Memorandum, ought certainly be useful for the Division office.

Use of $\frac{1}{4}$", 1/8" and 1/16" dashes to distinguish the different trout streams would seem undesirable, because many of the trout streams on a small scale map would not be more than half an inch long. The color idea would seem better. Red for all species of trout might be desirable, especially if accompanied by the symbols for the species (such as St, Bt, Rt). Or, perhaps better, three colors could be used, such as orange, brown and purple.

We would urge the coloring of bass streams also, as the building up of small mouth fishing in streams appears to have been rather badly neglected and in need of attention. Green might be used for bass streams leaving some other color (blue?) for streams definitely indicated as neither trout nor bass water.

Since special designations are subject to repeated changes, these might better be indicated by pin-spotting, using pins of a color very distinct from those used for the planting reports.

Another idea would be to coat a set of maps with some transparent and washable medium so as to check plantings by colored pencil. Or the ordinary blueprints could be so used, one of each county each year.

Whether pin -spotting or pencil checking is adopted, the idea is one of obvious merit. Having seen a similar system used in "rescue" operations along the Mississippi River, we appreciate the value of such a system. An important point is to have waters in need of planting so designated as by white pins, to be replaced by colored pins when the planting is reported.

Very likely waters scheduled for improvement work could be indicated on the same or similar maps.

It would seem obviously impossible to show all lakes and streams on a single state map. Probably two maps for the Upper Peninsula and four for the Lower would be needed, and even then the maps would need be large. The Nesbit map on a scale of 3/16" per mile is clearly too small. A scale of 3/8" per mile would seem about right. Even then very small lakes and streams which are or should be stocked could not be shown.

RE RIVER SYSTEM MAPS

There are surely advantages in fish management planning and administration by river systems, though the county seems in many ways a more practicable unit. In administering one county, it should be feasible to do this, keeping in mind the needs of the waters of the same stream system in the other counties.

Maps by stream system could of course be made up by mounting together the county maps including the system, either outlining the system boundary by heavy line, or by cutting off all areas outside the system.

INSTITUTE FOR FISHERIES RESEARCH

Carl L. Hubbs
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Westerman - original with original drawing.