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An Evaluation of Private Pond Stockings in Maine (2008-2016)

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ABSTRACT

Private ponds are ubiquitous across Maine's landscape, and provide an opportunity for land owners to stock fishes for recreation, enjoyment of nature, and/or a food resource. Along with these benefits, private stockings also have the potential to greatly impact Maine's native fish communities. The Maine Department of Inland Fisheries & Wildlife (MDIFW) oversees the permitting and stocking of private ponds, and these data (2008–2016) were analyzed to quantify trends in applications by number and species. In addition, 30 private ponds in Fisheries Management Region B were visited and evaluated to gain insight into pond features, salmonine holdover capacity, and connectivity to their respective watersheds via outlet streams.

Short-term trends indicated a decline in private pond applications at both a statewide and regional level, and coldwater species (i.e., brook trout and rainbow trout) were stocked far more readily than warm-/coolwater species. Visited private ponds averaged ~0.50 acres in size, stocked primarily with rainbow trout, sourced largely by groundwater and/or small streams, and salmonine holdover was either confirmed or anticipated in 60% of waters. A small percentage (23%) of applicants were incorrect in verifying whether their private ponds had outlets.

While no private pond stockings have resulted in documented populations of non-indigenous, self-sustaining fishes, other legal and illegal stockings have introduced invasive species statewide. MDIFW's current permitting process is comprehensive and minimizes risks, but it is time-consuming. Therefore, this study offers five recommendations to better streamline the private pond applications process and enhance protection of indigenous fishes.

KEY WORDS: PRIVATE, POND, STOCKING, APPLICATION, SALMONINE, RAINBOW TROUT, BROOK TROUT.

INTRODUCTION

Private ponds are ubiquitous across Maine's landscape, and provide an opportunity for land owners to stock fishes for personal recreation, aesthetics, and/or a food resource. Private ponds are typically formed by construction-dug depressions that are wetted, almost exclusively through four different sources including (1) precipitation, (2) ground water, (3) impounded intermittent or perennial streams, and/or (4) well water. Regardless of source or size, once formed, private ponds become part of the respective drainage/watershed, and therefore deserve attention by fisheries managers as their stocking has the potential to impact resident fish assemblages (Rahel 2004; Patoka et al. 2014).

The Maine Department of Inland Fisheries & Wildlife (MDIFW) oversees the permitting and stocking of private ponds by landowners in the state of Maine. The process requires landowners to submit an application identifying various stocking specifics including, (1) contact info, (2) map identifying pond's locations, (3) outlet presence, (4) desired species to be stocked, (5) pond's stocking history, and (6) fish source. The application is reviewed and approved/denied by the Fisheries Management Supervisor with input from Regional Fisheries Biologists.

There are a few key factors that determine whether private pond stocking applications are approved. Stocking of salmonines is almost exclusively limited to brook trout (BKT), rainbow trout (RBT), and/or brown trout (BNT), and fish must be purchased from predetermined, licensed commercial hatcheries that provide disease free fish. Specific guidelines have been established to minimize the potential risk from stocked RBT and BNT to indigenous salmonine populations (i.e., BKT, Arctic charr (CHR), sea-run Atlantic salmon (SRS)) (MDIFW 2015). In addition, private stockings of RBT and BNT are prohibited in several Maine watersheds (Figure 1).

A separate application requesting the stocking of other warm-/coolwater fishes including legal baitfish (BAIT) – chiefly golden shiner (GLS), rainbow smelt (SLT), smallmouth bass (SMB), largemouth bass (LMB), sunfish (SUN), yellow perch (YLP), brown bullhead (BUL), white sucker (WHS), American eel (EEL), and chain pickerel (PKL) is permitted but only with careful consideration of their potential impact on native species, the private pond's geographic location, and the source water from which the stocked fish are transferred.

Since private pond stockings are numerous, occur statewide, and have the potential to introduce fishes that may outcompete Maine's native fish communities, it is important for fisheries managers to better understand their distribution and characteristics. Therefore, the goals of this study were to investigate (1) the current trends in private pond stocking applications by region and species, and (2) the physical features and biological characteristics defining a representative sample of private ponds in Maine.

METHODS

Analysis of Statewide Private Pond Stocking Applications

Private pond stocking applications are received in MDIFW's main office and put in a comprehensive and sortable database. These data (2008–2016) were analyzed to evaluate short-term trends in the (1) total number of private pond stocking applications by year, (2) total number of private pond stocking applications by Fisheries Management Region by year, (3) total number of private pond applications by salmonine species by year, and (4) total number of private pond stocking applications for non-salmonine species by year.

Evaluation of Select Private Ponds – Region B

A random selection of thirty recently stocked private ponds in Fisheries Management B were visited and evaluated to determine species stocked, other fishes observed, approximate pond size, water source, observed outlet presence versus outlet presence stated on application, primary reason for stocking, and capacity for salmonine holdover (Figure 2). Salmonine holdover capacity was determined by field observations, pond examination, angling, and /or legitimate anecdotal reports and categorized as (1) Confirmed, (2) Possible, (3) Unlikely, or (4) Unfeasible. All private pond owners were contacted and visitation was approved prior to pond evaluation.

RESULTS

Analysis of Statewide Private Pond Stocking Applications

From 2008 to 2016, the total number of private pond stocking applications statewide trended downward, with the maximum number of permits issued of 605, a minimum of 360 permits (Figure 3), and a mean of 485 permits. The number of private pond stocking applications varied by Fisheries Management Region over the same 9-year time period (Figure 4). The majority of the applications were issued to landowners in Region B (mean = 177 applications/year), Region A (111), Region D (76), and Region C (54), while few applications were issued in Region F (27), Region G (25), and Region E (21).

Approximately 96% of all private pond applications requested salmonine stocking (i.e. BKT, RBT, and BNT) from commercial hatcheries. Of the three salmonines, BKT were stocked most readily (mean = 254 applications/year), followed by RBT (164), and BNT (41). Salmonine stocking numbers may be skewed because of hatchery availability (e.g. if brown trout are unavailable, brook or rainbow trout may be stocked as a substitute). Private pond stocking applications for other permissible fishes included approximately 13 warm/coolwater species, with the majority listed in the Introduction section.

Evaluation of Select Private Ponds – Region B

Private ponds averaged just under a half-acre in size, and ranged from 0.01 acres to 3.85 acres (Table 1). The vast majority (29/30 – 97%) were stocked with salmonines. RBT were the most frequently stocked species (25/30 – 83%), while BKT (11/30 – 37%), BNT (1/30 – 3%), BAIT (1/30 – 3%), and/or LMB/SMB (1/30 – 3%) were stocked far less often. Various baitfish species were observed in 53% (16/30) of private ponds, while no other fishes were viewed in the remaining ponds.

Private pond water was largely sourced by groundwater (18/30 – 60%), while impounded streams (7/30 – 23%), well water (2/30 – 7%), precipitation (1/30 – 3%), and uncertain sources (2/30 – 7%) were observed less often. The capacity for select ponds to provide suitable year-round salmonine holdover was confirmed in 33% (10/30) of ponds, possible in 27% (8/30), unlikely in 27% (8/30), and unfeasible in 13% (4/30).

In over three-quarters (77% - 23/30) of private ponds, outlet presence (on application) matched field observations, but outlet discrepancies were recognized at the remaining sites. Specifically, six applications (20%) were approved with no outlet listed, but field observations confirmed their presence.

Most landowners stocked their private ponds with fishes primarily to create a recreational angling opportunity (22/30 – 73%), while fewer stocked for enjoyment of nature (5/30 – 17%), and even fewer for harvest and consumption (3/30 – 10%).

DISCUSSION

Statewide Private Pond Stocking Applications

At both a statewide and regional level, private pond stockings have displayed a short-term decline since 2008. Although this study did not pinpoint the precise reason(s) for this decline, there are a few factors that may have contributed to this decrease including:

- Expanded stocking programs using larger, more desirable salmonines into more public waters by MDIFW.
- Increased cost and limited availability of hatchery-reared salmonines.
- Expanded geographic limitations on RBT stockings.
- Greater habitat conservation and land acquisitions by land trusts, private entities, and non-governmental associations.

From 2008 to 2016, private pond owners statewide stocked more BKT than any other species. Brook trout are popular for private stockings because they are native to Maine, provide high catch rates, and

are permitted in more watersheds than RBT and BNT. Where permitted, RBT are also very popular for private pond stockings. Like BKT, they are highly catchable, and anglers report RBT as a better fighting fish. Additionally, they are also an attractive option as they are more tolerant of high water temperatures, and therefore are more capable of summer holdover. BNT provide a third salmonine stocking option, but whether it is a result of low catch rates and/or hatchery availability, they are stocked far less often than BKT and RBT.

MDIFW encourages private pond owners to start out by stocking salmonines, but other fishes (e.g., LMB, PKL, YLP, BUL) are also stocked, albeit much less frequently, making up just 4% of the private stockings analyzed in this report. These fishes are attractive to some private pond owners as they are more tolerant of high water temperatures during summer and low dissolved oxygen levels during winter, can successfully spawn and proliferate, and provide a fast action angling experience. Like salmonines, these applications are highly scrutinized by MDIFW, and they are generally approved if the species is already present in the watershed and can be relocated from the private pond's respective drainage. Fish transfers are only permitted during a limited time period (typically a week or two), and specified donor water(s) are listed on the application. Pond owners must possess a valid fishing license and adhere to daily bag/possession limits for the respective water(s). This process ensures no new species and/or potential pathogens are inadvertently introduced.

Select Private Ponds – Evaluation

Region B private ponds that were visited and evaluated closely mirrored statewide species stocking preferences, namely more salmonines were stocked than other permissible fishes. Most pond owners were unaware that species other than BKT, RBT, and BNT could be stocked at all, and this confusion was understandable. The private pond form available online, *Application for Permit to Stock Private Pond with Fish from a Maine Commercial Hatchery*, lists only the three salmonine species. The other form, *Application for Permit to Take Wild Fish from Maine Waters to Stock in Private Waters*, is available by request and is not currently available online.

Private ponds are commonly referred to as “farm ponds” and largely believed to be shallow and unsuitable for salmonine holdover. The results from this study revealed a much different picture. Most private ponds were sourced by groundwater and/or by small, impounded tributaries, providing year-round cold water. In addition, private ponds had very few competitor fishes and a supplemented food source provided by land owners. As a result, many ponds provided ideal conditions for year-round growth and survival (Figure 7).

A small proportion of applicants were incorrect in verifying whether their private ponds had outlets. This would appear troubling; a threat to native fish communities. However, outlet determination by pond owners has little bearing on application approval. Stocking request determinations are all treated as though outlets are present and privately stocked fishes have the potential to enter public waters.

Therefore, approvals are only granted if stocked fishes are anticipated to have a negligible impact on resident fish communities in the drainage.

Due to staffing limitations, MDIFW does not typically visit private ponds prior to application approval/denial, but all locations are initially reviewed using geographic information system (GIS) software. This can be problematic, as some images are subjective and may not be accurate (e.g. new construction since aerial image was taken). In these cases, applicants are contacted during the review process to provide additional information.

CONCLUSIONS/RECOMMENDATIONS

In Maine, documented non-native fish stockings have occurred for several decades and in some cases, it has been to the direct detriment of native salmonines (Larson et al. 1995, Hasegawa et al. 2004, Thibault and Dodson 2013). Smallmouth bass were first introduced in 1868, and they are now present in portions of many of Maine's major watersheds (e.g. Androscoggin, Kennebec, Penobscot) (Warner 2005). Rainbow and brown trout have been stocked in thousands of public waters statewide, and it is only through repeated annual stockings that some have resulted in wild, self-sustaining populations (i.e. RBT – Kennebec River (Bingham), Sunday River (Newry); BNT – Upper Sandy River (Phillips), Sheepscot River (throughout)).

Recognizing that there are risks to native fish populations, MDIFW has established a comprehensive private pond stocking application process that minimizes the potential for exotic introductions. Hundreds of applications are processed annually, and while staffing and funding limit personal inspection of all ponds, the review process is still thorough. However, with minor modifications, the process can be made more streamlined and better protect indigenous fishes. Therefore, the author recommends the following changes:

1. The dual application system is confusing and could be replaced with one form for all private stockings. The new form could be formatted to cater to pond owners hoping to stock hatchery-raised salmonines and/or wild fishes from public waters in the same drainage.
2. The private pond stocking application could transition to a purely digital format. This would streamline the process for both private land owners and MDIFW.
3. Private pond owners are currently required to submit an accurate pond location map with each stocking application. To ensure consistency, each application could require a copy of the mapped location taken from Delorme's - The Maine Atlas and Gazetteer, along with a detailed description of the pond's location on property, preferably with UTM coordinates.
4. Regardless of stated outlet presence, private pond owners could be required to submit detailed pond photos. If photos, map, and desktop GIS investigation are not sufficient to assess the

potential risk to native salmonines, fisheries staff could perform a site visit prior to application approval/denial.

5. Fisheries biologists could randomly select a small percentage (~10%) of their current regional private pond applications and perform site visits to verify application integrity.

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TABLES AND FIGURES

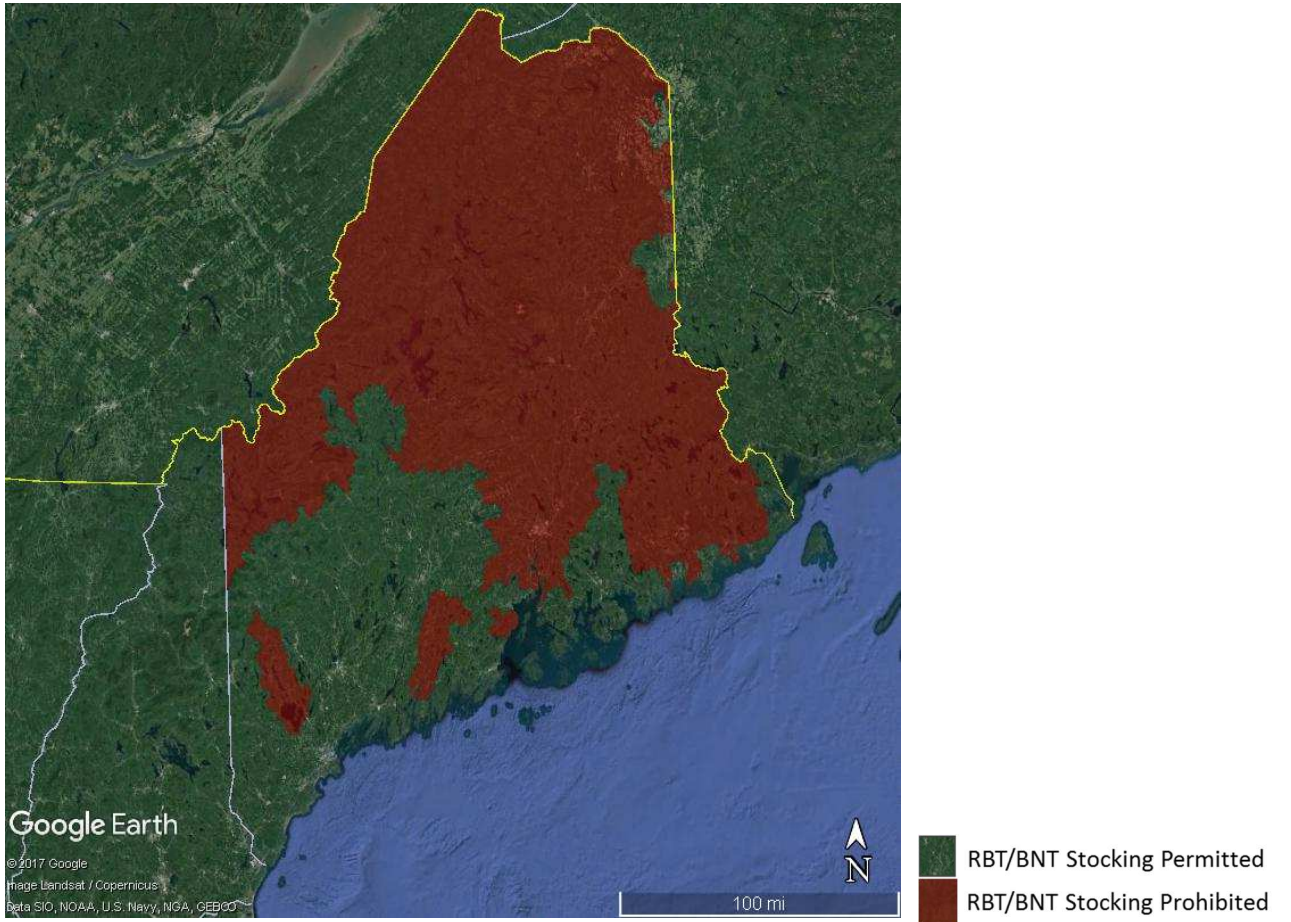


Figure 1. Watersheds closed to private pond RBT/BNT stockings in Maine.

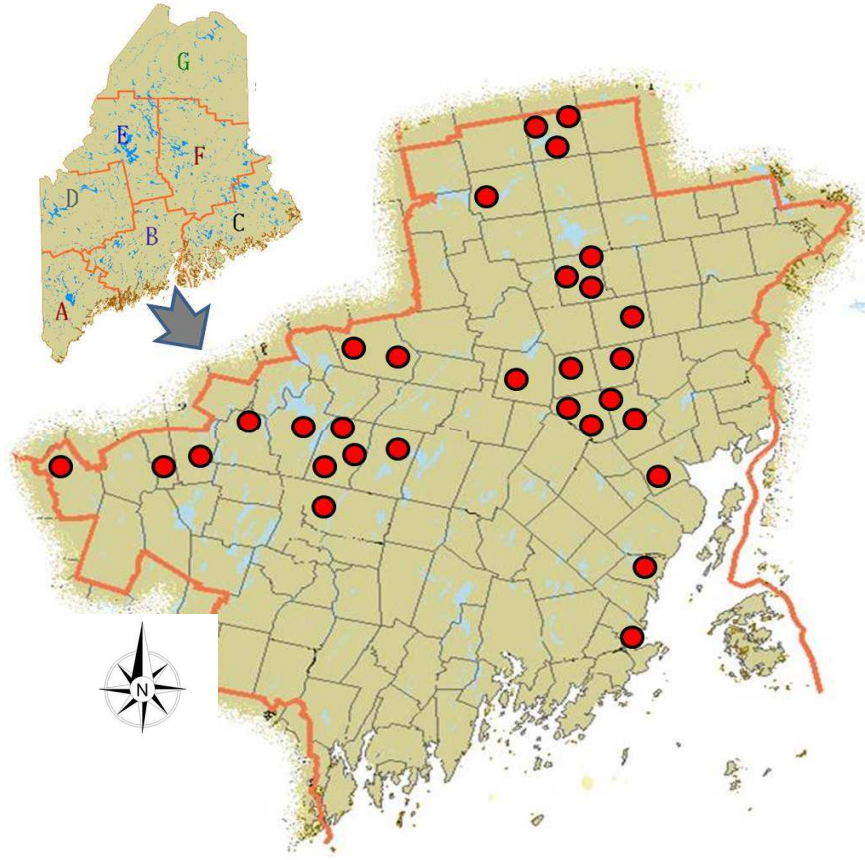


Figure 2. Locations of 30 private pond stocking locations in Fisheries Management Region B visited and evaluated by fisheries biologists.

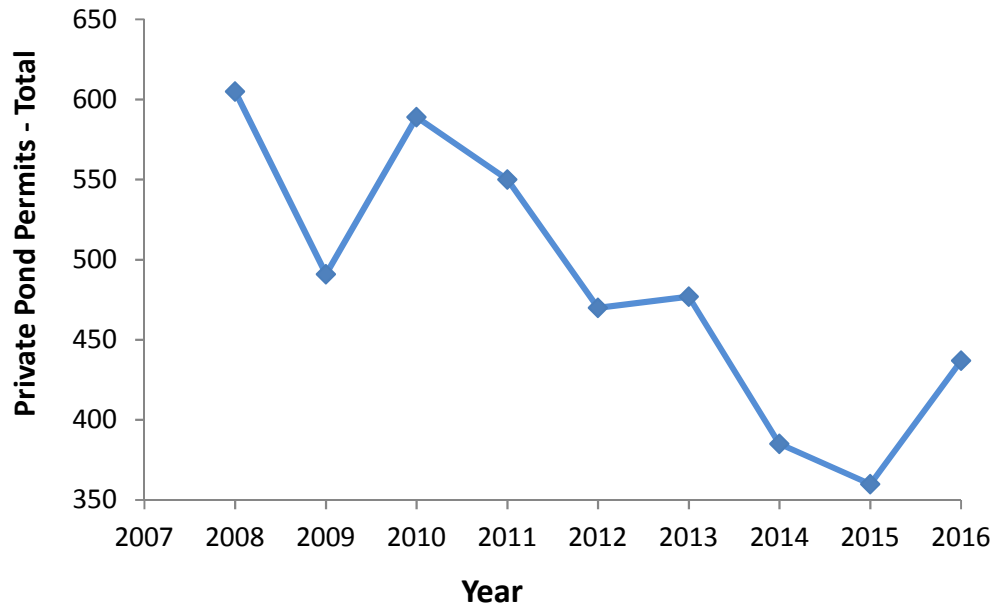


Figure 3. Total number of private pond stocking applications in Maine (2008–16).

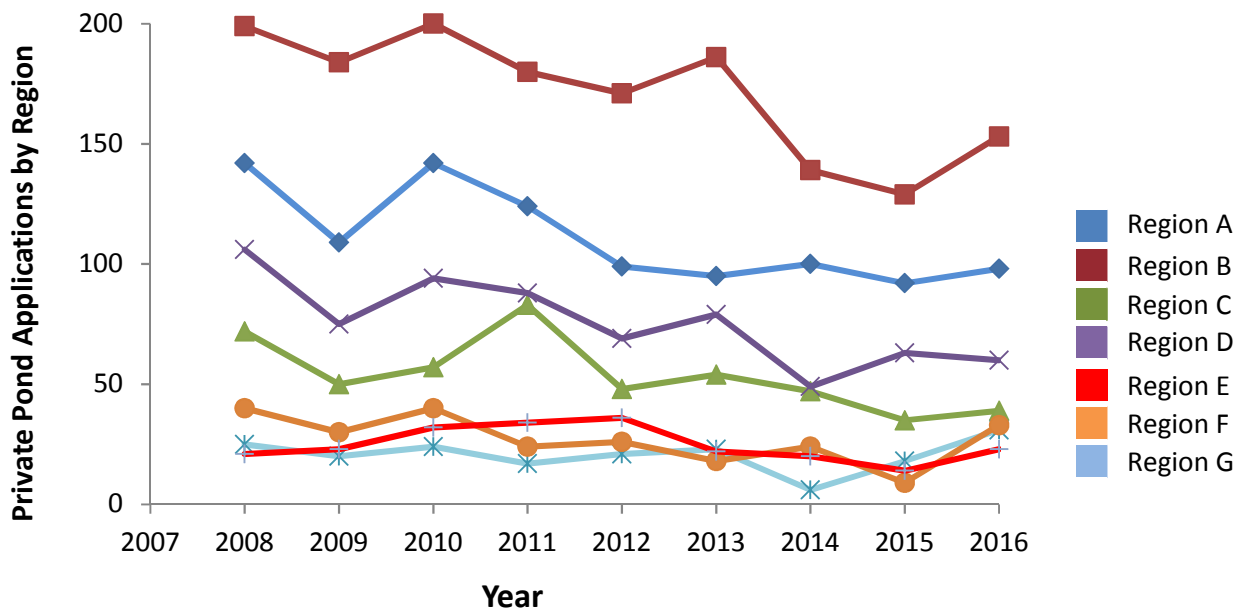


Figure 4. Private pond stocking application by Fisheries Management Region (2008–16).

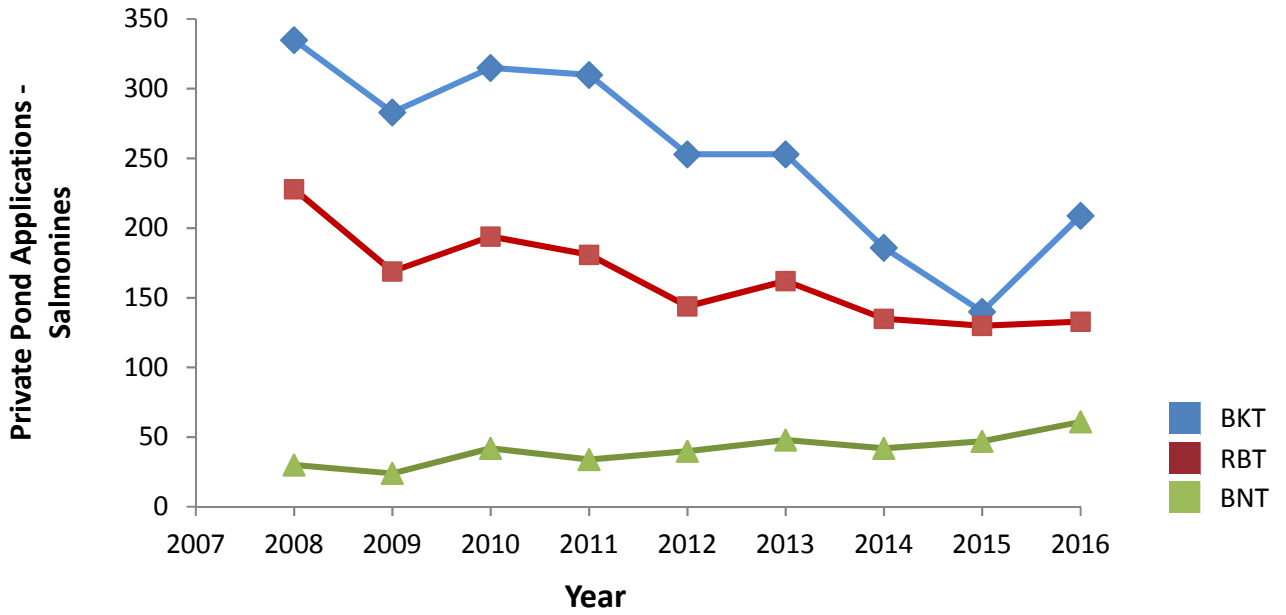


Figure 5. Private pond stocking applications – Salmonines (2008–16).

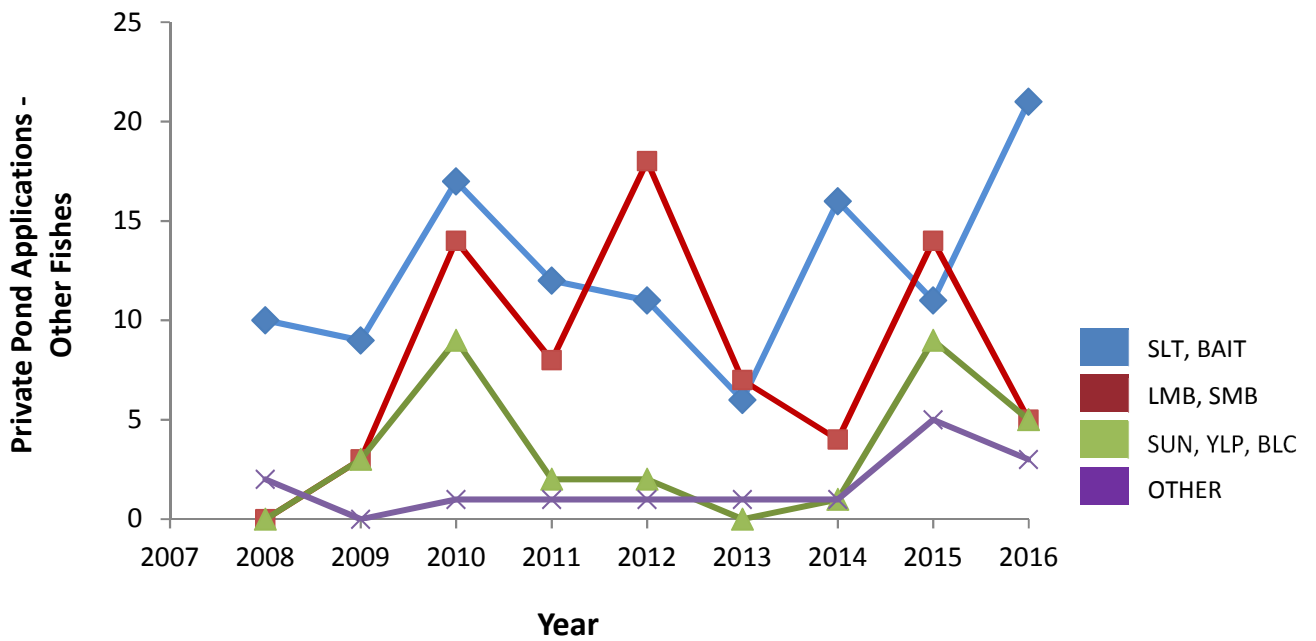


Figure 6. Private pond stocking applications – Other permissible fishes (2008–16).

Table 1. Site characteristics for thirty recently stocked private ponds – Fisheries Management Region B.

<u>Pond #</u>	<u>Town</u>	<u>Size (ac)</u>	<u>Species Stocked</u>	<u>Other Fishes</u>	<u>Water Source</u>	<u>Outlet- Permitted</u>	<u>Outlet - Observed</u>	<u>Salmonine Holdover</u>	<u>Reason</u>
1	Augusta	0.25	RBT	No	Ground	No	No	Unlikely	Recreation
2	Belfast	0.01	GLS, CMS	No	Public	No	No	Unfeasible	Aesthetic
3	Belgrade	3.85	RBT	BUL	Stream	No	Yes	Possible	Recreation
4	Brooks	0.57	BKT, RBT	BAIT	Uncertain	Yes	No	Unlikely	Recreation
5	Brooks	0.06	RBT	No	Stream	No	Yes	Unlikely	Recreation
6	Camden	0.32	RBT	No	Public	Yes	Yes	Unfeasible	Recreation
7	Dexter	0.05	RBT	BAIT	Ground	No	No	Confirmed	Recreation
8	Dexter	0.02	RBT	BAIT	Ground	No	No	Confirmed	Recreation
9	Dexter	0.10	BKT	No	Ground	No	Yes	Possible	Food
10	Dixmont	1.38	RBT	BAIT	Uncertain	Yes	Yes	Unlikely	Recreation
11	Fairfield	0.24	BKT, RBT	No	Surface	No	No	Unfeasible	Food
12	Fairfield	0.09	RBT	No	Ground	Yes	Yes	Confirmed	Food
13	Fayette	0.45	RBT	BAIT	Stream	Yes	Yes	Unfeasible	Aesthetic
14	Hartford	0.09	BKT, RBT	BAIT	Stream	Yes	Yes	Confirmed	Recreation
15	Jackson	0.55	BKT	No	Ground	Yes	Yes	Unlikely	Recreation
16	Knox	0.42	BKT	BAIT	Ground	Yes	Yes	Confirmed	Recreation
17	Knox	0.33	RBT	No	Ground	No	No	Possible	Aesthetic
18	Livermore Falls	0.70	BNT, RBT	BAIT	Ground	No	No	Possible	Recreation
19	Mount Vernon	0.18	BKT, RBT	BAIT	Ground	No	No	Confirmed	Aesthetic
20	Plymouth	0.06	RBT	BAIT	Ground	No	No	Unlikely	Recreation
21	Plymouth	0.46	BKT, RBT	No	Ground	No	No	Possible	Recreation
22	Plymouth	0.14	RBT	BAIT	Ground	Yes	Yes	Possible	Recreation
23	Rockland	1.53	RBT	BAIT	Ground	No	No	Possible	Aesthetic
24	Saint Albans	0.29	BKT	BAIT	Ground	No	Yes	Confirmed	Recreation
25	Sidney	0.36	RBT	No	Ground	No	No	Unlikely	Recreation
26	Sidney	0.79	BKT, RBT	BAIT	Stream	No	Yes	Possible	Recreation
27	Sidney	0.06	BKT, RBT, SMB, LMB	No	Stream	No	Yes	Unlikely	Recreation
28	Thorndike	0.98	RBT	BAIT	Ground	Yes	Yes	Confirmed	Recreation
29	Unity	0.20	RBT	No	Ground	Yes	Yes	Confirmed	Recreation
30	Vassalboro	0.16	RBT	No	Stream	Yes	Yes	Confirmed	Recreation



(A)



(B)

Figure 7. Site photos showing: (A) a private pond in Fairfield with confirmed RBT holdover by field observation, and (B) a private pond in Unity with confirmed RBT holdover by fish collection (RBT in photo was ~20-inches & 5-pounds).

COOPERATIVE



This report has been funded in part by the Federal Aid in Sport Fish Restoration Program. This is a cooperative effort involving federal and state government agencies. The program is designed to increase sport fishing and boating opportunities through the wise investment of angler's and boater's tax dollars in state sport fishery projects. This program which was founded in 1950 was named the Dingell-Johnson Act in recognition of the congressmen who spearheaded this effort. In 1984 this act was amended through the Wallop Breaux Amendment (also named for the congressional sponsors) and provided a threefold increase in Federal monies for sportfish restoration, aquatic education and motorboat access.

The program is an outstanding example of a "user pays-user benefits" or "user fee" program. In this case, anglers and boaters are the users. Briefly, anglers and boaters are responsible for payment of fishing tackle, excise taxes, motorboat fuel taxes, and import duties on tackle and boats. These monies are collected by the sport fishing industry, deposited in the Department of Treasury, and are allocated the year following collection to state fishery agencies for sport fisheries and boating access projects. Generally, each project must be evaluated and approved by the U.S. Fish and Wildlife Service (USFWS). The benefits provided by these projects to users complete the cycle between "user pays – user benefits."



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