WATER STEWARDSHIP PLAN

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prepared for

Kennebec Water District
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Waterville, Maine 04901

KWD
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WATER STEWARDSHIP PLAN
KENNEBEC WATER DISTRICT

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EXECUTIVE SUMMARY

In 2022, Kennebec Water District (KWD) was awarded a Source Water Protection grant from the Maine Drinking Water Program to prepare a Water Stewardship Plan (Stewardship Plan). The purpose of the Stewardship Plan is to assess existing and future KWD actions aimed at protecting and improving the water quality of China Lake which serves as the sole water source for KWD. KWD has relied on China Lake as its raw water source since 1905. Starting in the 1970s water quality in China Lake started to degrade and in 1983 the lake experienced it first agal bloom. Since that time KWD has dedicated significant time and effort towards protecting and improving the water quality in China Lake. This Stewardship Plan was prepared to help identify, prioritize and provide a roadmap to guide KWD's future source water protection efforts in the China Lake watershed.
This plan incorporates two complementary principals:

> ***Stewardship & Sustainability*** which encompass careful and responsible management of the water resource for the benefit of present and future customers and users.

KWD's core mission is to deliver potable water to its customers. Source water stewardship is only one component of its operations. Effective water stewardship recognizes that there are things *KWD can control* such as intake location, owned land, etc., there are things *others control* such as land development and non-point pollution, and there are things *no one controls* such as the climate and economy. Because of these limitations and other requirements, successful long-term stewardship of the KWD's China Lake source requires collaboration and partnership with stakeholders in the region.

Four primary components were evaluated in preparation of the Water Stewardship Plan:

- Water quantity and availability
- Water quality
- Water-related regulations, ordinances, and statutes
- Habitat and land use

The methodology for developing the Plan involved several tasks:

1. Compiling information about the water quantity, water quality, regulations and land use in China Lake and its watershed. The 2022 *China Lake Watershed-Based Management Plan* was a key source of information on water quality conditions and concerns, and land use practices in the watershed.

2. Discussions with KWD staff and trustees to understand current practices, concerns, and potential opportunities to contribute to the stewardship of China Lake.

3. Meetings with stakeholders in the watershed to discuss their priorities, areas of focus and expertise; and to identify shared concerns. External stakeholders that contributed to this study included the Town of China, China Lake Association, China Lakes Regional Alliance, Maine Department of Environmental Protection and Maine Inland Fisheries and Wildlife.

4. Synthesizing this information into a Stewardship Plan identifying and prioritizing existing actions, as well as, new initiatives, KWD can implement to protect and improve the water quality of China Lake.

The KWD Water Stewardship Plan is intended to be living document designed to guide KWD in the use of its resources, authority and collaboration with other organizations, to protect and improve the water quality of China Lake for the long-term benefit of its customers and stakeholders.
The Water Stewardship Plan is specific to KWD and recommends six ***High Priority Actions*** including:

Water Quality Monitoring: Continue monitoring water quality in China Lake and share these data with partner organizations working on improving water quality in the lake.

Preserve Statutory Protections : KWD should review and identify any necessary updates to the 1931 and 1969 Maine statutes that restrict bathing and trespassing to protect China Lake quality.

Improve Intake Protection & Security. To provide improved protection of the intake, KWD evaluate the feasibility, benefits and costs of relocating the boat launch or the intakes.

Manage KWD Land to Protect Water Quality: Maintain KWD Forest Management Plan and best practices.

Improve Education and Awareness About China Lake: KWD can continue to improve and expand its education outreach including consideration of renewed school-based education program, updating KWD signage and information plaques, collaborating with CLA, and CRLA on outreach activities in the watershed.

Medium Priority Actions recommended for consideration in the Plan include:

Conserve Undeveloped Land in the Watershed: Land conservation in the watershed can have many benefits for protecting and improving the water quality by protecting important recharge areas and limiting transport of pollutants into the lake. An inventory of priority lands for conservation should be completed and KWD should develop a policy on land acquisition versus land protection in partnership with others.

Expanded Monitoring to assess inlet stream and assess alewife re-introduction on water quality

Supporting Efforts to Reduce Land Use Impacts: Identifying effective organizations and actions aimed at reducing point and non-point source pollution.

Implementation and Administration of Actions: Identifying staffing and financial resources required to implement the actions identified in the Stewardship Plan, including possible creation of a dedicated lake stewardship staff position.

WATER STEWARDSHIP PLAN
KENNEBEC WATER DISTRICT

1.0 INTRODUCTION

The Kennebec Water District (KWD), the first water district in the United States, was established in 1899 and currently provides public drinking water to nearly 9,000 customers. KWD provides drinking water to the communities of Waterville, Winslow, Fairfield, Vassalboro, Benton and is a wholesale supplier of water to the Town of Oakland (Maine Water Company). KWD maintains over 170 miles of water mains with 634 public hydrants that provide fire protection to its member communities. Since 1905, KWD has used China Lake as it's source of supply. Raw water is withdrawn from the West Basin of the China Lake and flows via gravity to KWD's water treatment plant (WTP) in Vassalboro where it is treated and enters the distribution system.

Prior to the 1980s, water quality in China Lake was high, however during the 1970s and early 1980s there was a marked degradation of water quality characterized by decreased dissolved oxygen and clarity, increased nutrients, particularly phosphorous, and the onset of annual algal blooms. In response to the degradation in China Lake water quality and the federal Surface Water Treatment Rule, KWD built its current WTP in the early 1990s to maintain drinking water quality for its customers.

While KWD's WTP can produce high quality treated water despite the degraded water quality in China Lake, it has a strong interest in preventing further degradation and improving the water quality of China Lake. Throughout the years, KWD has made a significant effort to protect and improve the water quality in China Lake and the surrounding watershed. KWD has been actively involved in monitoring lake water quality and participating in lake protection activities with local associations, including China Lake Association (CLA) and China Region Lake Alliance (CRLA). KWD also served on the Steering Committee and Technical Advisory Committee during the development of the December 2021 *China Lake Watershed-Based Management Plan (WBMP)* prepared for the Kennebec County Soil & Water Conservation District.

In 2022, KWD secured a Source Water Protection grant from the Maine Drinking Water Program and retained C. A. White and Associates, LLC (CAW) and Drumlin Environmental, LLC (Drumlin) to prepare this Source Water Stewardship Plan. The goal of this Plan is to compile information about on-going KWD activities to improve lake water quality and to prioritize and guide KWD's future efforts. This Plan has been prepared by:

- Identifying and reviewing KWD's existing policies and programs;
- Reviewing the current condition of China Lake as determined through the 2021 *WBMP* and other on-going monitoring and assessments;
- Evaluating measures to preserve and improve lake water quality;
- Soliciting input from KWD staff, trustees and external groups with an interest and commitment to lake improvement; and,
- Developing this Stewardship Plan for actions that KWD is well-suited to undertake on its own and in collaboration with other stakeholders.

2.0 OVERVIEW OF CHINA LAKE

KWD has relied on China Lake as its raw water source for more than 115 years and during most of that time, the trophic status of the lake was oligotrophic. This category of lakes is characterized by high clarity and dissolved oxygen throughout the water column and low nutrient concentrations. During the 1970s and through the 1980s water clarity and dissolved oxygen concentrations decreased in China Lake. In 1983, the lake experienced its first documented algal bloom, which continued to occur regularly in subsequent years. Since the 1980s, the trophic status has degraded from oligotrophic to eutrophic, a category of lakes characterized by low clarity and dissolved oxygen, and high nutrient concentrations. Long-term water quality trends in China Lake show a decline in water clarity in both the east and west basin, an increase in chlorophyll-A in the east basin, and a decrease in the depth to the anoxic zone during the summer in both the east and west basins. Monitoring over the last decade indicates slight improvements in the water quality in the west basin as indicated by a decrease in phosphorus and chlorophyll-A compared to historical levels.

China Lake continues to be listed as an impaired waterbody in the 2022 Integrated Water Quality report prepared by the Maine DEP, as it has since 2000.

The December 2021 *WBMP* compiled historical China Lake water quality data and collected recent lake water and sediment quality. The *WBMP* also compiled information about a variety of watershed characteristics including land use, land cover, soil type and habitat in the China Lake watershed. Figure 1 depicts the extent of the China Lake watershed. The lake characteristics described in the *WBMP* are summarized in Table 2-1 below.

Evaluation of the data identified phosphorous as the primary constituent that effects water quality by promoting the growth of algae. Increased algal growth or population, increases the chlorophyll-A and decreases the transparency of the lake. As the algae die, they decompose, which depletes oxygen in the water column. When the algae die, they also settle to the bottom of the lake, which transports phosphorous to the lake bottom sediments.

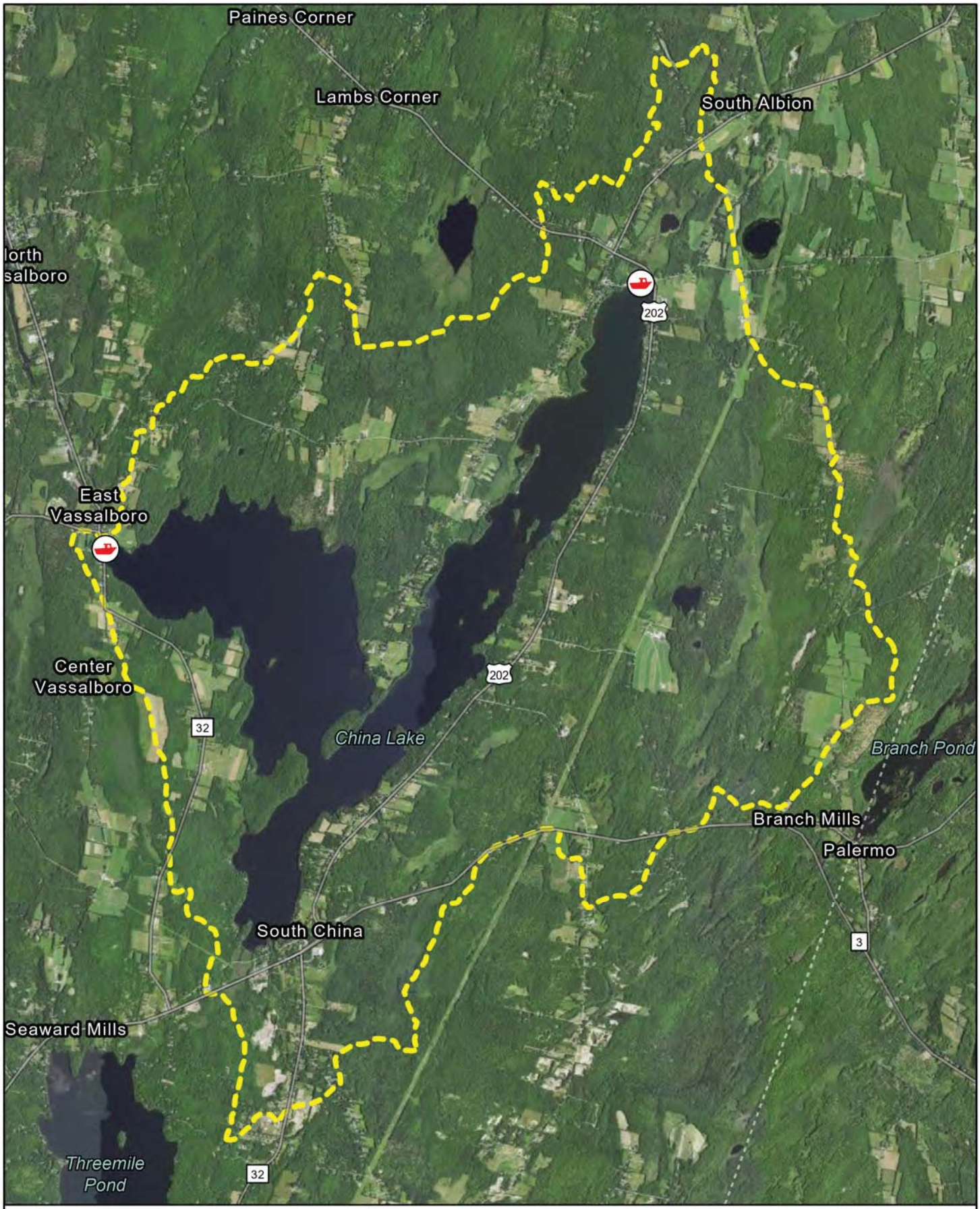

FIGURE 1
China Lake Watershed

Table 2-1
China Lake Characteristics

Characteristic	Value
Watershed Area	16,975 acres
Towns in Watershed	China, Vassalboro, Albion, Winslow
Lake Surface Area (total)	3,939 acres
East Basin: Surface Area/Max Depth/Volume/Flushing	2,154 acres/ 56 ft / 12.09 billion gal/ 0.68 times/yr
West Basin: Surface Area/Max Depth/Volume/Flushing	1,815 acres/ 92 ft / 16.27 billion gal/ 0.64 times/yr
Inlet Brooks & Streams	West Basin: Ward East Basin: Jones, Starkey, Hunter, Muldoon
Outlet	Outlet Steam flows from the West Basin (Dam controlled)
Water Supply Safe Yield	20 million gallons/day
East Basin Shoreline	452 of 529 lots are developed
West Basin Shoreline	KWD Owns All Except 2 lots
Lake Water Quality	• Eutrophic • Low Transparency/Clarity • Low Dissolved Oxygen Below Thermocline • Elevated Phosphorous • Elevated Chlorophyll-A

Based on the data evaluation and modeling conducted as part of the *WBMP*, in the East Basin approximately 45% of the phosphorous load is derived from the existing lake sediments, 41% of the phosphorous load is introduced by non-point source runoff (predominantly soil erosion), and 7% is derived from septic systems. The remainder is estimated to derive from waterfowl and atmospheric sources.

In the West Basin, phosphorous loading is primarily from existing lake sediments (40%), inflow from the East Basin (35%) and non-point source runoff (19%). Septic systems are estimated to contribute 5% of the phosphorous loading with the remainder from water fowl and the atmosphere.

Reduction of the phosphorous load is needed to control and improve the water quality of China Lake. The *WBMP* goal for China Lake to have a stable or improving water quality

trend and to be free of nuisance algal blooms. To achieve this, the *WBMP* identified total in-lake phosphorus targets as 10 ppb in the East Basin and 12.5 ppb in the West Basin.

Climate change related impacts likely to influence China Lake include variation in precipitation intensity and increasing temperature. Higher air and water temperatures can result in increased algal growth, which increases the extent and duration of anoxic zones resulting in increased phosphorus release to the surface water. Increases in rainfall intensity may result in increases in amount of nutrient loading to the lake from the watershed via stormwater runoff. The *WBMP* estimated that climate change could increase the phosphorous load to China Lake by an additional 71 and 65 kg/yr in the east and west basins, respectively.

Recent testing has detected low levels of 3 per- and polyfluoroalkyl substances (PFAS) compounds (PFHpA, PFHxA, and PFOA) in China Lake. The total concentrations were between 7 and 10 parts per trillion, which is below Maine's Interim Drinking Water standard for PFAS. The source(s) of the PFAS in not known, but it may be associated with surface runoff and possibly septic system inputs in the watershed. KWD is in the process of evaluating possible future treatment for these compounds.

3.0 CURRENT KWD POLICIES AND PROGRAMS

As described above, KWD has several on-going policies and programs on and adjacent to China Lake that are relevant for the protection and improvement of their source water quality. These are described briefly below.

- Statutory Protections. The Maine Legislature, recognizing the value in protecting the water quality in China Lake, granted KWD statutory protections in 1931 and 1969 (see Appendix A).
    - ❖ In 1931 the legislature passed an act that "no person shall bathe in the waters of the West Basin of China Lake", punishable by a fine of not more than $20 dollars per offense.
    - ❖ In 1969 the legislature passed an act that "all persons are forbidden to trespass on the lands owned by the Kennebec Water District bordering on the waters of China Lake", punishable by a fine of not more than $20 for each offense.
    - ❖ The 1969 legislation also granted KWD authority to require application and issue permits, along with the municipality, to install septic systems within 500 feet of China Lake.
- Intake Protection. KWD has two intake structures in the West Basin of China Lake (see Figure 2) connected to 24-inch and 30-inch diameter transmission pipelines intake structures. Both intakes are near the bottom of the lake. The 36-inch intake is located in approximately 17 feet of water and the 24-inch intake is located in approximately 15 feet of water. KWD is authorized by Title 22, Part 5, Chapter 601, Subchapter 4, Article 2 to maintain a 400-foot exclusion zone around the intakes.

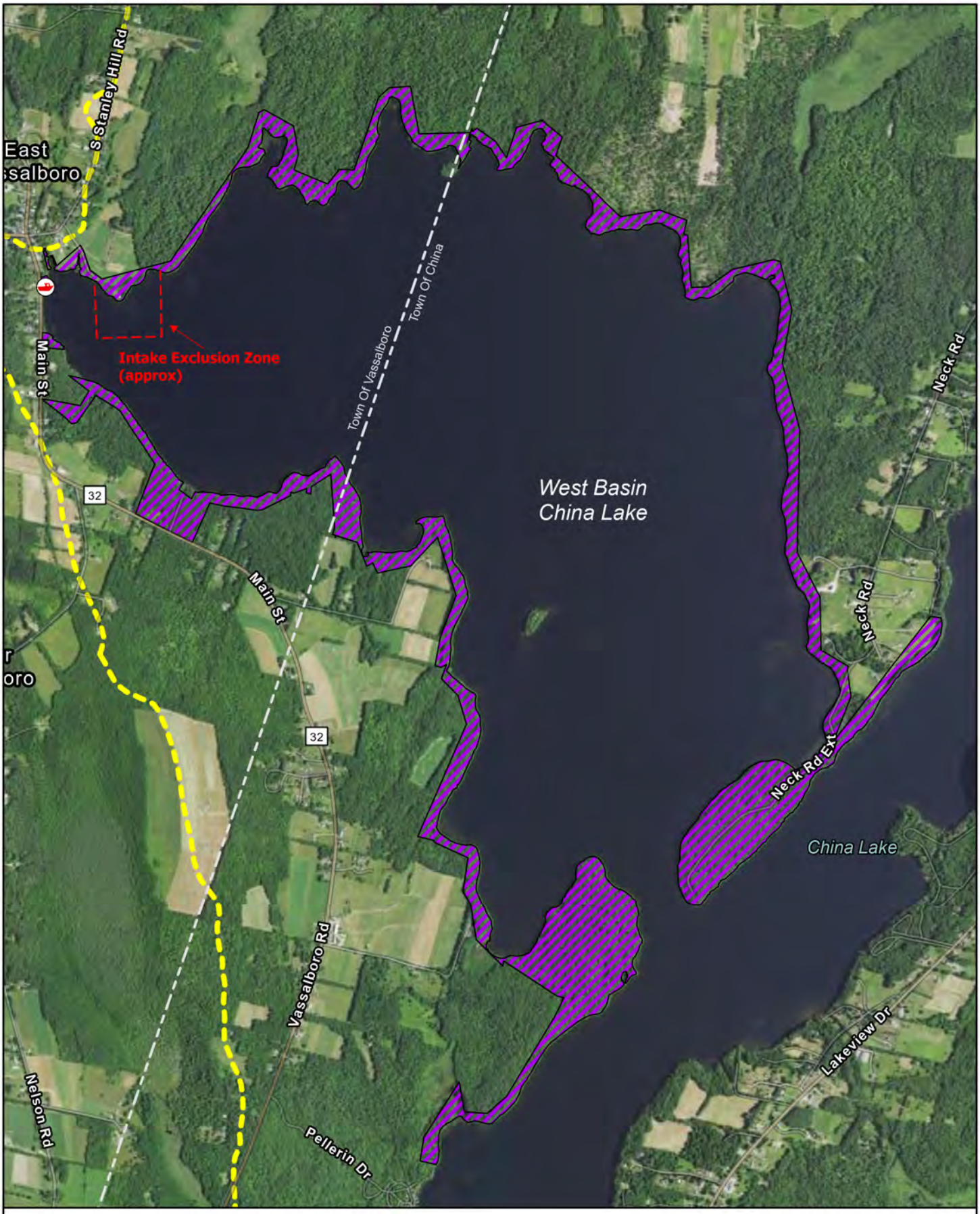

FIGURE 2
KWD West Basin
China and Vassalboro, Maine

KWD places and maintains buoys approximately 200 feet from its intakes to mark this exclusion zone and has placed an informational sign at the boat launch on Route 32 in Vassalboro. However KWD has no enforcement authority and relies on the county sheriffs or the Maine warden service for enforcement against trespassing in the exclusion zone.

- KWD Land Ownership. In the early 1900's, KWD began efforts to acquire and protect land around the West Basin from development, to protect the source water quality. By 1912, KWD had purchased approximately 10 miles of shoreline the West Basin of China Lake. As shown in Figure 2, KWD has purchased all the shorefront land surrounding the West Basin except two lots along the shoreline at the western edge of the basin, along Route 32. The 1969 law passed by the Maine Legislature prohibits trespassing on these KWD lands.

- Forest Management. In 2019, KWD adopted a Forest Management Plan for the approximately 343 acres of land it owns along the shore of China Lake. According to this Plan, the primary goal is to establish an uneven aged, mixed species forest that is resilient, resistant to disease and other stressors and therefore protects water quality. The Plan was amended in 2022 to incorporate seedlings planted on 6.5 acres of previously non-forested area on the North Narrows Peninsula.

- Water Quality Monitoring. KWD regularly monitors the quality of its influent raw water from China Lake at its treatment plant on Route 32 in Vassalboro. Ongoing water quality testing has demonstrated that the treated water supplied by the KWD to its customers meets or exceeds all applicable drinking water quality standards.

  Beginning the 1980s, KWD collaborated with the MDEP and collected water temperature and dissolved oxygen data from the lake. In 2015, KWD began collecting total phosphorous and chlorophyll-A data in the West Basin. In 2017, KWD expanded collection of these parameters to two stations in the East Basin. KWD also participated in additional lake sampling, including both water and sediment, as part of the development of the December 2021 *WBMP*. Currently KWD collects biweekly baseline water quality samples from April through October at three stations on China Lake, one station in the West Basin and two stations in the East basin. In 2022, KWD began collecting zooplankton samples to establish baseline conditions and to monitor potential water quality changes associated with the recent re-introduction of alewives to China Lake.

- Education, Outreach & Partnerships. KWD has been involved with a number of activities to educate the public and state and local agencies about China Lake and the importance of source water protection. These activities include such things as placing informational signs at the Vassalboro boat launch and conducting educational programs in local schools. KWD participated in the development of the *WBMP*, serving on the Steering and Technical Advisory Committees. KWD staff serves on the board of CLA and KWD provides funding to support CLA and the CRLA boat inspection and China Lake LakeSmart programs.

Each of these activities enhances the protection of the source water quality of China Lake. This Stewardship Plan has reviewed and incorporated all of these activities in our assessment.

4.0 WATER STEWARDSHIP DEVELOPMENT AND FINDINGS

This section provides an overview of water stewardship, describes the process used in development of this Plan and discusses the findings.

4.1 Overall Approach and Philosophy for Water Stewardship

Water quality in China Lake is influenced to varying degrees by land use and activities that have historically occurred and are currently occurring in the entire 27 square mile watershed. The 2021 *WBMP* includes a comprehensive assessment of land uses and other influences on China Lake water quality. KWD controls or has direct influence on only a limited land area immediately around the shoreline of the West Basin. KWD's core mission is to deliver safe potable water to its customers, and so water stewardship is only one of many components of its operation. Because of these limitations and other requirements, successful long-term stewardship to improve water quality will require collaboration and partnership with stakeholders in the region.

China Lake's watershed is located within the towns of China, Vassalboro, Albion, and Winslow but only residents in the Town of Vassalboro and Winslow are served by KWD. Of the almost 4000 acres of that make up the China Lake watershed, 89% are located in the Town of China. While the majority of the watershed is in the Town of China, KWD does not serve China residents, and this presents some additional challenges when working to influence land uses that protect lake water quality as drinking water source.

In preparing this Plan, the four primary components of water stewardship described below have been evaluated.

- Water Quantity. Data were reviewed to understand the seasonal, annual and longer-term water inputs and fluxes through China Lake and to assess whether KWD's withdrawals are sustainable for KWD and the long-term health of the lake.

- Water Quality. As described in previous sections, the water quality of China Lake has deteriorated significantly since the 1970s and 1980s. Preventing further deterioration and undertaking actions to improve water quality is a primary interest for KWD and many other stakeholders.

- Water-Related Regulations, Ordinances and Statutes. KWD must comply with a host of federal, state and local regulations, legislation, ordinances. The Maine Legislature has also granted KWD certain authorities to protect its source water. Regulations, ordinances and statutes that influence China Lake water quality have been identified

and reviewed during development of this Plan.

- Habitat and Land Use. Undeveloped areas provide natural protection of water quality by preventing erosion and filtering water flowing across the watershed to China Lake. Because of this, these natural landscapes and undeveloped land uses are valuable for long-term water quality stewardship. Developed areas have the potential to contribute soil and other constituents that can degrade water quality either from specific source locations, such as septic systems, or from general runoff and other non-point sources (NPS). Developed land uses and their influence on water quality were cataloged in the 2021 *WBMP* and have been considered in development of this Plan.

4.2 Information Gathering for Water Stewardship Plan Development

Development of this Water Stewardship Plan involved several tasks.

5. Gathering information to understand the water quantity, water quality, regulations and land use related to the China Lake and its watershed;
6. Identifying KWD's current practices, concerns and potential opportunities to contribute to stewardship of China Lake;
7. Meeting with stakeholders to discuss their concerns, priorities and areas of focus and expertise; and,
8. Compiling the information gathered into a Stewardship Plan that incorporates KWD's expertise, capabilities and priority actions as well as shared stakeholder priorities.

China Lake has been extensively studied since the water quality decline in the late 1970s and early 1980s. Water quality data, land use and other factors that influence lake quality were recently compiled in the 2021 *WBMP*, which was an important source of information and data. KWD has also been an important source of information including information on its infrastructure, water use, water treatment, monitoring and other programs. Collectively, this information and data provided an understanding of the current quantity, quality, regulatory and land use conditions for China Lake.

With this understanding, discussions were held with important stakeholders to identify areas of common interest, as well as any areas of potential conflict. In this study, we define stakeholders as

- KWD Staff and Trustees.
- Those who impact KWD and China Lake. For example, regulatory agencies and local residents around China Lake.
- Those that KWD has an impact on such as recreational water users, local residents and KWD customers.
- Those who have a common interest such as the Towns of China and Vassalboro and CLA and CRLA.

KWD has developed productive and longstanding relationships with several stakeholders including the Towns of China and Vassalboro, CLA, CRLA and state agencies including the Maine DEP and IFW. These stakeholders influence the lake, but also benefit from

KWD activities. In addition to these entities , KWD customers represent important stakeholders that are affected by water quality initiatives, but also financial and operational concerns. The KWD Board of Trustees, a 10-member body elected to represent the KWD communities, is empowered to represent the customers served by KWD.

As part of the development of this plan, and in consultation with KWD staff, a series of stakeholder meetings were organized. The purpose of these meetings was to introduce the objectives of the Water Stewardship Plan and solicit stakeholder input on their activities, challenges and priorities related to China Lake.

Four stakeholder meetings were held in the fall of 2002 and winter of 2023 with:

- KWD Trustees
- Local Municipalities
- Lake Protection Non-Profits: China Lake Association; China Region Lake Alliance
- Maine State Agencies: Maine Department of Environmental Protection and Maine Inland Fisheries and Wildlife.

Roger Crouse, KWD General Manager and Robbie Bickford, KWD Water Quality Manager scheduled and participated in these stakeholder meetings.

A brief summary of each meeting is provided below.

Trustees:

The process and objective for the Water Stewardship Plan was presented before having an open discussion aimed at soliciting trustee priorities on water quality, regulatory and management issues. Following the discussion, the trustees completed a written survey to rank their priorities related to potential KWD activities and investments. Appendix B includes a summary of the trustee survey. The following initiatives were ranked as high priorities by the KWD Trustees

- Continuing water quality monitoring program in China Lake;
- Land ownership/ protection in the watershed;
- Partnerships with organization that focus on maintaining or improving China Lake water quality
- Supporting efforts to minimize non-point source pollution in the watershed; and,
- Supporting Town of China and Vassalboro in maintaining and improving ordinances and code enforcement directed toward protecting lake water quality.

Towns:

KWD contacted staff from the Towns of China and Vassalboro and a meeting was held with the China Town Administrator and Code Enforcement Office. Vassalboro staff were in transition and did not participate. Discussion during the meeting included shared goals of protecting China Lake water quality; various initiatives to prevent algal blooms, and ways to educate new property owners about land use related impacts on lake water quality. The Town of China has several ordinances that regulate phosphorus input, runoff, and development in the shoreland zone. The Town of China adopted a Phosphorus Control Ordinance in 1993 that sets limits on phosphorus inputs from new development. The Town

also uses Tax Increment Financing Funds (TIFF) to support lake water quality improvement initiatives.

At the meeting, the town said that there was significant development pressure and that over 200 properties had changed hands in the past few years. Town representatives indicated that the local political climate was not supportive of any major initiatives to improve land use controls and management. In 2020 the Town of China adopted a revised Comprehensive Plan, but no use ordinances have been implemented as part of the process. The Town considered adopting a Low Impact Development ordinance in 2013, but no ordinance has been adopted to date. The difficulties associated with Code Enforcement, including the frequent turnover of CEOs, was also discussed. Specific challenges identified by the Town included the following.

- Town has limited staff capacity and financial resources to address lake water quality;
- Development pressure continues to increase;
- There has been an influx of new residents unfamiliar with the influence of land use on lake water quality;
- Significant CEO turnover in recent years has resulted in difficulties in land use ordinance enforcement; and,
- Local political climate has limited support for land use or lake protection initiatives or expenditures.

Local Non-Profit Organizations: CLA & CRLA

China Lake Association, China Lakes Regional Alliance and KWD have had long-term, productive collaborations on lake water quality monitoring programs. KWD has also provided financial support for the *WBMP*, and the CRLA Youth Conservation Corps and LakeSmart programs.

All organizations share the goal to protect and improve water quality in China Lake. The recent completion of the *WBMP* was a successful collaboration of all three organizations and identified shared goals including:

- Continued water quality monitoring in China Lake and sharing the data with stakeholders;
- Reduction in non-point pollution sources that contribute nutrients to the lake;
- Community outreach and education;
- Land conservation and protection;
- Regulation and enforcement; and,
- Identifying funding sources.

Challenges identified by CLA and CRLA included:

- Implementation of *WBMP* recommendations due to limited funding and resources;
- Staffing, funding, sustainability of both CLA and CRLA;
- Controlling phosphorus sources and costs associated with alum treatment; and,
- Land protection in watershed and lack of a local, active land trust.

State Agencies MDEP and IFW:

In the meeting the stakeholders discussed their various roles and responsibilities. Maine DEP is responsible for the general ecological health of the lake, including monitoring, assessing and responding to lake water quality concerns, nutrient inputs and other sources of potential pollution. Maine DEP has been working with KWD for decades on water quality and invasive species programs. Funding through Maine DEP's 319 grant program has supported several studies and stormwater runoff mitigations aimed improving lake water quality. Maine DEP was also actively involved in funding and supporting the *WBMP*. Maine IFW is responsible for managing, stocking and regulatory enforcement of the fresh water recreational fishery in lake. DMR, not in attendance at the stakeholder meeting, is responsible for managing the re-introduction of alewives to the lake. Participants from Maine IFW emphasized the important of China Lake as a recreational fishing resource due to its location and good public access. The lake is a two-tiered fishery comprised of warm water species like smallmouth bass and cold water species like brown and brook trout. KWD's concerns related to the close proximity of the boat launch to the intakes were discussed and IFW agreed to check on their potential enforcement role in managing the issue. Shared goals include:

- Improving long-term water quality in China Lake, particularly dissolved oxygen levels, which IF&W has identified as an important factor in supporting the recreational freshwater fishery;
- Maintaining good forest management practices to prevent degradation of water quality and serve as a model for watershed landowners; and,
- The IF&W Beginning with Habitat (BwH) program offers education and outreach resources to local towns, residents and schools, including model ordinances, development review, training, etc.

The Maine DEP and IF&W outlined challenges they face, including the following.

- Both agencies cover a lot of territory with limited staff.
- Each agency has different objectives. Neither agency has an objective for drinking water source protection. Their objectives focus primarily on fisheries and ecosystems, but do overlap and aligned in some areas with KWD's mission.

There were also some potential conflicts between agency and KWD objectives, which include:

- Boat ramp traffic in the West Basin and enforcement of the intake security zone;
- Vehicles on the lake in the winter for ice fishing;
- Re-introduction of alewives and the associated lack of water quality monitoring to assess potential water quality and ecosystem impacts; and,
- Funding and implementation of possible future alum treatment of the lake have the potential to impact KWD source water quality.

4.3 Summary of Stewardship Information and Findings

Extensive historical and recent evaluation of China Lake has identified diminished water quality as the primary concern and challenge for all stakeholders, including KWD. Land use in the watershed, particularly in the East Basin, has had and continues to have, a

significant influence on water quality through phosphorous input to the lake. Additionally, past phosphorous input has created a significant reservoir in lake sediments and internal cycling of phosphorous from these sediments was identified in the 2021 *WBMP* as the largest annual phosphorous contributor.

In addition to water quality and land uses that influence water quality, KWD also identified several priorities associated with their current authority and practices.

Information gathered from KWD and stakeholders during development of the Plan is summarized in tables included in Appendix B. These table are organized following the stewardship components described in Section 4.1 and include:

1. Water Quality;
2. Regulations, Ordinances and Statutes;
3. Habitat/Land Use; plus,
4. Education and Outreach

Water quantity is an important water stewardship component. However, KWD's withdrawals of 3 to 4 million gallons per day (MGD) is far below the estimated drought condition safe yield of approximately 20 MGD. And there are no other significant water users in the China Lake watershed. For this reason, water quantity was not identified as a limiting condition for the foreseeable future.

The summary tables in Appendix B include all of the issues of concern/challenges raised by KWD and the stakeholders. Based in the information and data compiled for this study, goals and action items have been identified that have the potential to address each challenge. This collection of concerns/challenges was reviewed with KWD to identify priorities for KWD that are included in the Stewardship Plan presented in Section 5.0.

5.0 KENNEBEC WATER DISTRICT WATER STEWARDSHIP PLAN

5.1 Water Stewardship Plan Goal

KWD's goal in creating this Water Stewardship Plan is to develop:

A living document that guides the work of the Kennebec Water District in the use of its resources, authority and collaboration with other organizations to protect and improve the water quality of China Lake for the long-term benefit of its customers and stakeholders.

5.2 Water Stewardship Plan Summary

This section summarizes the KWD Water Stewardship Plan, beginning with Table 5-1, which summarizes the specific components of the KWD Water Stewardship Plan developed from the process and activities described in Section 4.0.

Table 5-1
KWD Water Stewardship Plan Summary

Priority	Category	Action	Recommendation
High	Water Quality	Monitoring	• Continue Baseline Water Quality Monitoring • Review Annually & Adjust Parameters as Needed • Provide Data to Other China Lake Stakeholders
High	Regulatory	Preserve Statutory Protections	• Review 1931 and 1969 Statutes to Determine Whether Language Should Be Updated • Consult with Local Legislators For Sponsorship • Develop Enforcement Strategy & Policy
High	Intake	Improve Protection & Security	• Conduct Feasibility Assessment Comparing The Benefit Of Relocating the Intakes vs Relocating the Boat Launch
High	Land Management	Manage KWD Land to Protect Lake Water Quality	• Maintain Best-Practice Forest Management Plan • Retain Independent Forest Professional to Monitor Harvesting to Ensure High Performance

Table 5-1
KWD Water Stewardship Plan Summary (cont.)

Priority	Category	Action	Recommendation
High	Outreach, Education & Partnerships	Improve Education & Awareness About China Lake	• Update & Renew School-Based Educational Program • Update KWD Signage of Watershed & At Boat Launches • Continue Collaboration & Support of CRLA & CLA Education & Outreach • Prepare Annual Report Summarizing Stewardship Action and Provide to Customers and Residents of China & Vassalboro
Medium	Land Conservation	Preserve Undeveloped Land In the Watershed	• Inventory Watershed to Identify Priority Land for Conservation • Contact Kennebec Land Trust and 7 Lake Alliance To Cultivate Potential Land Trust Partners • Develop a Policy for Direct KWD Property Acquisition vs Alliance with Land Trust or Private Landowners •
Medium	Water Quality	Expanded Monitoring	• Inventory Inlet Streams, Collect Water Quality Samples, Identify Priority Streams for On-Going Monitoring • Establish Monitoring by DMR or KWD to Assess Alewife Re-Introduction
Medium	Land Use	Reduce Impacts from Run-Off and Other Land Uses	• Develop Policy for What Organizations and Activities to Support Working to Reduce NPS Inputs • Funding Support for Town Codes Enforcement of Septic System Permits and Inspections within 500 Feet of Lake (in lieu of statutory authority)
Medium	Administration	Implementation of These and Additional Watershed Activities	• Identify the staff and financial resources required to implement watershed activities identified in this plan. • Review creation of a staff position dedicated to China Lake Stewardship

Each element of the Plan is discussed in further detail below.

5.2.1 Water Quality – Continued Monitoring. KWD is uniquely suited with trained personnel and equipment to conduct water quality monitoring in China Lake. Dating back to the 1980s, KWD in collaboration with the MDEP, began monitoring temperature and dissolved oxygen in the lake. Since 2015, KWD has also monitored total phosphorous and chlorophyll-A. In 2020, KWD conducted expanded water quality monitoring and also collected lake sediment samples to support the *WBMP*.

KWD currently monitors water clarity, dissolved oxygen and temperature profiles, total phosphorous and total chlorophyll-A biweekly from April through October at three stations in the lake. In 2022, KWD added zooplankton monitoring as a possible

indicator of the impact of alewife introduction.

It is a high priority to KWD to continue monitoring water quality in China Lake and make the data available to partner organizations working to improve water quality.

5.2.2 Regulatory – Preserve Statutory Protections. In 1931 the Maine Legislature prohibited bathing in the West Basin of China Lake to protect water quality for KWD. In 1969, the Legislature prohibited trespassing on KWD land and authorized KWD to issue permits for septic systems withing 500 feet of the lake. These measures were intended to help KWD protect and preserve its source water quality.

KWD should review the language and enforcement measures in this legislation and identify language and other updates to address current conditions and practices. KWD can then work with the local legislative delegation to develop and submit an updated bill.

KWD should also work with the Maine DEP and the Town of Vassalboro to correct the lake level order, which the Maine DEP issued to KWD, despite the fact that the Town of Vassalboro owns and controls the dam.

5.2.3 Intake - Improve Protection & Security. The location of the two KWD intakes and the surrounding exclusion zone conflict with the location of the current boat launch on Route 32 in Vassalboro, because boaters using the Vassalboro ramp have to detour around the exclusion zone to the south, rather than travel straight from the boat ramp to the narrows leading from the West Basin to the East Basin. As a result, boaters frequently pass through the exclusion zone, and near to or over the KWD intake. KWD has no direct authority to enforce the exclusion zone and must rely on the county sheriff or warden service. KWD does educate boaters with signs and personal contact when they are at the lake, but the effectiveness of this has been limited.

Protection of the source water intake is a high priority for KWD. The current configuration, monitoring and enforcement is does not provide the desired level of intake protection. KWD owns a parcel of land south of the current boat launch on Route 32 that could be developed to replace the current boat launch. Alternatively, it may also be feasible to relocate the current intakes so the exclusion zone is not between the boat launch and the East Basin. An assessment is recommended to compare the feasibility, benefits and costs of relocating the boat launch or the intakes.

5.2.4 Land Management – Manage KWD Land to Protect and Improve Water Quality. KWD developed a Forest Management Plan in 2019 with the goal of transitioning the forest on its land to a mixed age, multi-species forest that it resilient to climate variations, pests and other threats that might compromise the ability of the land to protect water quality. The plan incorporates best management practices (BMPs) from the *Best Management Practices for Forestry: Protecting Maine's Water Quality* (March 2017) and *Quabbin Reservoir Massachusetts: Managing a Watershed Protection Forest.* (August 1998 Journal of Forestry). In 2022, KWD planted tree seedlings on 6.5 acres of its non-forested land and updated the Forest Management Plan to incorporate this change.

We recommend that KWD retain an independent forestry professional to review all harvesting plans and to inspect all active harvesting activities to ensure adherence to the Forest Management Plan and BMPs.

5.2.5 Education, Outreach & Partnerships – Improve Education and Awareness of China Lake. KWD recognizes that protecting and improving the water quality of China Lake requires wide participation including lake front landowners, boaters and other users of the lake and the general public. KWD has erected informational/educational signs along roads at the boundaries of the watershed and at the Vassalboro boat launch. In the past, KWD also provided staff and teaching materials about lake ecology for students in the China and Vassalboro schools. KWD also provides financial support to CRLA for invasive species monitoring at the boat ramps through the Youth Conservation Corps and for the Lake Smart program. An important component of these programs is public education about China Lake and water quality.

KWD believes that public education and outreach can make a valuable contribution to protecting lake water and needs to be periodically refreshed and updated to engage interest from the public. Initiatives that KWD can pursue include updating signs, particularly at the boat ramps, so that the signs are easily noticed and understood. Signs that are changed seasonally also provide current information and fresh visuals.

KWD can also update and renew its school-based educational program to provide information to school-aged children who bring that information home to their parents and siblings.

Finally, KWD can collaborate with other organizations include CLA, CRLA and the towns of China and Vassalboro to promote multiple approaches to communication and outreach, including things such as new homeowner welcome pamphlets, cross linking websites and other social media.

5.2.6 Land Conservation – Preserve Undeveloped Land in the Watershed. Water Districts commonly support land conservation in their watersheds and recharge areas because undeveloped land protects water quality by providing natural filtration, controlling runoff and preventing development that includes septic systems, fertilize use and other point- and non-point source impacts. KWD staff, the KWD Board of Trustees and stakeholders such as CLA and CRLA agree that conserving currently undeveloped land in the watershed is an important component of preserving and improving water quality of China Lake.

There are three general approaches to land protection or conservation.

- The land owner can enroll property in a state tax program including Tree Growth or Open Space, which reduces taxes in return for maintaining the land in accordance with the requirements of the particular program. If private landowners were willing to enroll their property in one of these tax programs, KWD does not have to take any action or incur any cost. However, the land is not permanently conserved and

the current or future landowner could unenroll and develop the land in the future.

- A land trust could acquire a permanent conservation easement on land or could purchase the land in fee. This has the potential advantage that KWD does not have to expend funds to purchase the land and does not have to manage the land. KWD could support the land trust financially and in raising grant funds, which often score well when protection of water bodies is one of the goals.

  There are currently no land trusts that actively own land in the China Lake watershed, however we recommend contacting two land trusts to discuss KWD's land conservation goals. The Kennebec Land Trust (KLT) (https://www.tklt.org/) is based in Winthrop and its service territory extends east to Vassalboro, including the west side of the West Basin. KLT owns 169 acres of land in Vassalboro west of Webber Pond. The 7 Lakes Alliance (https://www.7lakesalliance.org/) is a land trust and also refers to itself as a lake trust. They have experience conserving land to protect the water quality of the Belgrade Lakes and have a long-standing relationship with Colby College.

- KWD can also directly acquire conservation easements and or land in fee. This provides KWD with directly long-term control, but requires funds for the purchase and management of the land. If KWD were to purchase land, it might be feasible for some parcels to maintain long-term ownership of the portions of the land that are most valuable for water quality protection and sell other portions to recoup some costs. However, selling resource protection land may require approval by the Public Utilities Commission (PUC).

To facilitate KWD's land conservation goal, we recommend that land in the watershed be inventoried to identify parcels with high value for water quality protection. Information compiled in the 2021 *WBMP* can be used to conduct this inventory. We also recommend contacting KLT and the 7 Lakes Alliance to discuss KWD's goals and solicit interest for collaboration.

5.2.7 Water Quality – Expanded Monitoring. KWD's is committed to continue its water quality monitoring, which has focused on existing and known conditions in the lake, particularly related to phosphorous and eutrophication. In addition to this existing monitoring, KWD should consider two additional activities.

- Inlet Stream Monitoring. The *WBMP* includes estimates of the phosphorous input from the tributary streams in the watershed based on land use characteristics. But it would be beneficial to collect actual water quality data for phosphorous, nitrogen and other parameters such as PFAS, etc. to measure baseline conditions in these tributaries. These streams flow from the wider watershed into the lake and can be a significant contributors of phosphorous, other nutrients, PFAS and other compounds of interest. Data from streams would help prioritize areas of the watershed for additional monitoring, non-point source remediation and/or land conservation. Understanding the current baseline will also allow trends to be monitored over time.

- Monitoring of Alewife Impacts. In 2022, full access to alewife migration was restored to China Lake along Outlet Stream. It is estimates that approximately 180,000 alewives entered the lake system in 2022. Migrating alewives enter the West Basin and can migrate and spawn throughout the lake. According to the MDEP, state agencies do not have a water quality, fish passage or fish population monitoring program to evaluate changes in water quality (improvements or declines). Considering that alewives have not had a significant presence in China Lake for decades and they are entering the lake into West Basin, we recommend that KWD work with the Maine Department of Marine Resources (DMR) or other state agency to develop and implement a monitoring program for China Lake. Alternatively, KWD could independently develop and begin implementation of a monitoring plan, which could be phased depending on the data results and would be complimentary to the existing water quality monitoring.

5.2.8 Land Use – Reduce Impacts from Run-Off and Other Land Uses. The *WBMP* identified a number of land uses near the lake and in the wider watershed that contribute phosphorous to the lake. These land use sources, which include erosion from gravel roads and developed land, fertilizer runoff, etc., were estimated to contribute 41% of the annual phosphorous load to the East Basin. Private septic systems were estimated to contribute an additional 7% of the annual phosphorous load. KWD owns the majority of the shorefront land in the West Basin, which reduces the direct percentage of contribution into the West Basin compared to the East Basin. However, the *WBMP* estimates that 19% of the phosphorous load to the West Basin is from direct runoff. The potential source(s) of recent PFAS detections may also warrant further investigation.

KWD does not have authority or specialized expertise in managing or mitigating land use activities on town and private land. The towns have land use ordinances and enforcement authority. Towns can also secure Section 319 grants for mitigation of stormwater. However, the Towns of China and Vassalboro have many competing needs and limited staff resources. KWD could consider providing dedicated funding to the Town to augment its staff and enforcement resources focused on land uses that impact lake quality, including non-point source erosion and septic systems.

5.2.9 Administration – Implementation of Stewardship Plan and Additional Watershed Activities. In anticipation of implementing this Stewardship Plan, KWD will want to identify the staff, and financial resources required and to establish a schedule to track progress. The improvement of China Lake water quality is a long-term effort that will need to be sustained by KWD and other watershed partners. In light of this, the importance of lake water quality to KWD and the importance of KWD to the overall lake stewardship effort and outcome, we recommend that KWD consider the costs and benefits of creating a staff position dedicated to China Lake Stewardship. Potential benefits of this position would be that KWD would have:

- A dedicated person to lead, implement and track the actions in this Stewardship Plan;
- A greater presence in the watershed to improve education, and coordinate with enforcement agencies, if needed;

- A liaison with other watershed partners including the Towns, CLA, CRLA, etc.
- A dedicated person to interact with and potentially support watershed improvement actions by lead by CLA, CRLA, State Agencies and others that were identified in the *WBMP* and are likely to become more active in future years.

6.0 IMPLEMENTATION OF THE KWD WATER STEWARDSHIP PLAN

The Watershed Stewardship Plan described in Section 5.2 includes activities currently being implemented by KWD as well as several new or expanded activities. Table 6-1 below outlines suggested roles and responsibilities for the KWD staff and Trustees.

As described previously, an important component of the long-term success of the Stewardship Plan is leveraging the authority, expertise and capacity of others, through collaboration with other stakeholders that share the goal of improving China Lake water quality. This collaboration is currently lead by the KWD Water Quality Manager. As discussed in Section 5.2 and noted in Table 6-1, we also recommend that KWD assess whether all stewardship activities, including collaboration opportunities, would be enhanced by creation of a staff position dedicated to lake stewardship.

Several of the Stewardship Plan activities also require additional funding. Development of this Plan has not included a specific funding assessment, but possible resources have been compiled and are included in Appendix D.

Table 6-1
Water Stewardship Plan Roles & Responsibilities

ACTION	ROLES & RESPONSIBILITIES
Water Quality Monitoring	KWD staff, in collaboration with MDEP, CLA and CRLA.
Preserve Statutory Authority	KWD Board of Trustees: Review & Determine Need KWD Staff: Implement
Improve Protection & Security	KWD Staff: Secure DWP Source Protection Grant Consultant: Conduct Assessment
Preserve Undeveloped Land In the Watershed	KWD Board of Trustees: Develop Conservation Policy KWD Staff: Contact KLT & 7 Lakes Alliance KWD Staff with CLA/CRLA: Inventory Watershed Land
Forest Management	KWD Staff: Plan Harvest Activities Independent Forester: Monitor Harvests
Improve Education & Awareness About China Lake	KWD Staff: Update Signs & School-Based Educational Materials KWD Staff: Collaborate with CLA, CRLA, Towns of China & Vassalboro, Maine DEP and IFW BwH
Expanded Monitoring	KWD Staff: Plan & Implement Baseline Stream Monitoring KWD Staff: Contact DMR, MDEP to Advocate for Alewife Monitoring Program
Reduce Impacts from Run-Off and Other Land Uses	KWD Staff: Develop Strategy to Funding Support NPS Mitigation KWD Board of Trustees: Review and Approve Resource Allocation
Dedicated Watershed Staff	KWD Trustees: Develop Staffing Plan and Allocate Funding

7.0 SOURCES CONSULTED

Comprehensive Land Technologies, Inc. June 2019. *Forest Management Plan.* Prepared for Kennebec Water District. 103p.

Comprehensive Land Technologies, Inc. September 2021. *South Narrows Peninsula Harvest Plan.* Prepared for Kennebec Water District. 10p.

Comprehensive Land Technologies, Inc. November 2022. *Forest Management Plan Amendment.* Prepared for Kennebec Water District. 7p.

Drumlin Environmental, LLC. March 2003. *Maine Public Drinking Water Source Water Assessment Program – Kennebec Water District – China Lake Watershed.* Prepared for Maine Drinking Water Program. 22p.

Ecological Instincts, March 2022. *China Lake Watershed-Based Management Plan.* Prepared for Kennebec County Soil & Water Conservation District. 180p.

Maine Department of Environmental Protection. 2022. *2018/2020/2022 Integrated Water Quality Report* p 90.

Wright-Pierce, June 2018. *Comprehensive Water System Facilities Plan for Kennebec Water District.* 177p.

APPENDIX A

Maine Legislative Acts Regarding Kennebec Water District

ACTS AND RESOLVES

AS PASSED BY THE

Eighty-fifth Legislature

OF THE

STATE OF MAINE

1931

Published by the Secretary of State, in conjunction with the Revisor of Statutes in accordance with the Resolves of the Legislature, approved June 28, 1820, March 18, 1840, March 16, 1842, and an Act of August 6, 1930.

KENNEBEC JOURNAL COMPANY
AUGUSTA, MAINE
1931

PUBLIC LAWS

OF THE

STATE OF MAINE

As Passed by the Eighty-fifth Legislature

1931

[supplied from page 1 of volume]

Chapter 67.

AN ACT to Prevent the Polluting of the Waters of the West Basin of China Lake.

Be it enacted by the People of the State of Maine, as follows:

Bathing in west basin of China Lake, prohibited. No person shall bathe in the waters of the west basin of China Lake, situated in the towns of China and Vassalboro in Kennebec county. Any person violating the provisions of this act shall be punished by a fine, payable to the state, of not more than twenty dollars for each offense.

Approved March 20, 1931.

Chapter 68.

AN ACT Closing Dry Pond to Hunting.

Be it enacted by the People of the State of Maine, as follows:

Dry Pond closed to hunting. Dry Pond, situated in the town of Gray, is hereby closed to all hunting for a period of six years from the effective date of this act.

Approved March 20, 1931.

Chapter 69.

AN ACT Relating to Dealer's Registration Under the Motor Vehicle Law.

Be it enacted by the People of the State of Maine, as follows:

R. S., c. 29, sec. 60; relating to dealer's registration, amended. Section sixty of chapter twenty-nine of the revised statutes is hereby amended by striking out the words "under oath" after the word "application" in the third line of said section, so that said section, as amended, shall read as follows:

'**Sec. 60. Application upon blank provided by secretary of state.** Every manufacturer or dealer in motor vehicles or trailers, may, instead of registering each vehicle owned or controlled by him, make application upon a blank provided by the secretary of state for a general distinguishing number, color, or mark. The secretary of state may, if satisfied with the facts stated in the application, grant the application and issue to the applicant a certificate of registration, containing the name, place of residence, and address of the applicant, and the general distinguishing number, color,

ACTS AND RESOLVES

AS PASSED BY THE

One Hundred and Fourth Legislature

OF THE

STATE OF MAINE

Published by the Director of Legislative Research in accordance with the Revised Statutes of 1964, Title 3, Section 164, Subsection 6.

THE KNOWLTON AND MCLEARY COMPANY
FARMINGTON, MAINE
1969

PRIVATE AND SPECIAL LAWS

OF THE

STATE OF MAINE

As Passed by the One Hundred and Fourth Legislature

1969

"Shall the Act Relating to Powers and Duties of the Public Safety Commission of the Town of Old Orchard Beach, passed by the 104th Legislature, be accepted?"

The voters shall indicate by a cross or check mark placed against the words "Yes" or "No" their opinion of the same.

This Act shall take effect for all the purposes hereof immediately upon its acceptance by a majority of the legal voters voting at said meeting; provided the total number of votes cast for and against the acceptance of this Act at said meeting equaled or exceeded 20% of the total vote cast for all candidates for Governor in said town at the next preceding gubernatorial election.

The result of the vote shall be declared by the municipal officers of the Town of Old Orchard Beach and due certificate thereof shall be filed by the town clerk with the Secretary of State.

Effective October 1, 1969

Chapter 120

AN ACT to Prevent the Pollution of the Waters of China Lake.

Be it enacted by the People of the State of Maine, as follows:

Sec. 1. Findings and intent. The Legislature finds and declares that China Lake, in the County of Kennebec, exceeds 10 acres in area and is a great pond, the waters of which, and the lands beneath said waters, are held by the State in trust for all; that such waters have been classified by the Legislature as B-1, and are intended thereby to be maintained in such a manner as to be suitable for recreational purposes, including swimming, and for potable water supplies after adequate treatment.

The Legislature further finds that said waters constitute a valuable natural recreational resource of the State, thereby aiding the economy of the State and the spiritual well-being of the citizens of and visitors to this State who enjoy the recreation such waters provide; and that such waters constitute the sole source of public water supply to the Kennebec Water District, which district serves the 5 municipalities of Benton, Fairfield, North Vassalboro, Waterville and Winslow.

The Legislature further finds that land in the China Lake watershed is being increasingly developed for residential and recreational use; that the principal means of waste disposal employed by residents within the watershed is the septic tank; that the drainage from large numbers of septic tanks will, unless adequately controlled, permeate the soil of the watershed, enter the waters of China Lake and accelerate the eutrophication process therein, thus depreciating the value of such waters as a recreational resource and necessitating costly expenditures to treat such waters before they are fit for their present use as a public water supply.

The Legislature intends by the enactment of this legislation to regulate waste disposal within the China Lake watershed to the end that the classification of the waters of China Lake may be maintained and their use as a recreational facility and source of public water supply may be preserved.

In accordance with the intent of this legislation, to prevent the pollution of the waters of China Lake, and in the furtherance of the desire of all concerned to maintain the value of China Lake as a valuable recreational resource of the State of Maine, and in view of the fact that this legislation forbids trespass on many of the lands bordering the lake, the Kennebec Water District shall make available certain of its shore properties within easy access to Route No. 32 in East Vassalboro available to the Vassalboro Park and Conservation Commission for development as a boat landing facility and picnic area, with sufficient room for parking, picnic tables and adequate sanitary facilities. Such area is to be developed and maintained by the Vassalboro Park and Conservation Commission or the State Park and Recreation Commission and approved by the Division of Sanitary Engineering, Department of Health and Welfare.

Sec. 2. Trespass. All persons are forbidden to trespass on the lands owned by the Kennebec Water District bordering on the waters of China Lake. Notices that the lands are so taken and held shall be posted in conspicuous places on said lands and along the shore of said lake abutting thereon, and any person trespassing on said lands shall be liable to a fine, payable to the State, of not more than $20 for each offense.

Sec. 3. Use. No person, firm, corporation or other legal entity shall use or occupy any structure upon or near the shores of China Lake or any of its direct tributaries in the County of Kennebec or upon any of the islands of said lake, for such purposes or in such manner that the sewage or drainage therefrom shall either enter the waters of said lake or any of its direct tributaries.

Sec. 4. Permits. Notwithstanding any other provision of law, or administrative regulation, including the State Plumbing Code, no person, firm, corporation or other legal entity shall install a septic tank, or a subsurface filter bed, absorption trench or leaching field intended to receive effluent from a septic tank or any other type of sewage disposal system, within 500 feet of the high water mark of the shore of China Lake without first obtaining such permits therefor as may be required by the appropriate municipal officials, and applying to the Kennebec Water District, in such form as the district may prescribe, and obtaining from the district a permit for such installation and construction; or without an order issued by the Division of Sanitary Engineering, Department of Health and Welfare, in the manner herein provided.

A. District permit; procedure. Upon receipt of an application under this section for an installation permit, the district shall examine the proposed location and conduct such tests as may in its judgment be necessary to determine the suitability of the proposed installation and location for septic tank waste disposal in a manner which will maintain the classification of the waters of China Lake and preserve their use as a recreational facility and source of public water supply. If the district finds that the proposed installation and location are so suitable, it shall issue a permit accordingly.

If the district finds that the proposed location or installation is unsuitable, it shall refuse to issue such a permit, and shall so notify the applicant in writing together with a written statement of the reasons for such refusal and the steps required to be taken before the installation or the location will qualify for issuance of a permit.

B. **Division of Sanitary Engineering permit; procedure.** Refusal by the municipal officials or by the district to issue a permit under this section shall oust such officials and the district of further jurisdiction with respect to issuance of a permit and the party to whom such refusal is directed shall then apply to the Division of Sanitary Engineering, Department of Health and Welfare, in such form as the division may prescribe, for a permit for such installation and location. Upon receipt of such application, the division shall examine the proposed location and conduct such tests as may in its judgment be necessary to determine the suitability of the proposed installation and location for septic tank waste disposal in a manner which will maintain the classification of the waters of China Lake and preserve their use as a recreational facility and source of public water supply. After such examination and testing, the division shall make findings of fact and issue its order denying a permit or granting a permit upon such terms and conditions as in its judgment will provide for the maintenance of the classification of the waters of China Lake and their preservation as a recreational facility and public water supply.

Sec. 5. **Orders, rules and regulations.** The division shall have authority to make reasonable regulations with respect to the installation of septic tanks and subsurface filter beds, absorption trenches and leaching fields intended to receive effluent from septic tanks, applicable to installations of the same within 500 feet of the high water mark of the shores of China Lake. Any such regulations shall be published at the expense of the Kennebec Water District in a daily newspaper published in the City of Waterville and a daily newspaper published in the City of Augusta and copies of said regulations shall be posted in at least 3 public and conspicuous places in each town in which said regulation is to take effect, and an affidavit of such publication and of the posting of said notice, executed by some official of the division and filed in the office of the district, shall be conclusive evidence of compliance with such requirements. Orders issued by the division under section 4 shall be sent by certified mail, return receipt requested, to the party affected or shall be served upon such party personally by a member of the division. In the event that any regulation issued by the division under this section requires a change in any method of waste disposal which was in existence on the effective date of this Act and prior to that date was in conformity to existing laws or regulations, no action shall be maintained for violation of such regulation unless and until the district shall have offered to bring, at its own expense, such method into compliance with the most recent regulation.

Sec. 6. **Judicial review.** Any person aggrieved by an order or regulation of the division issued under this Act may appeal therefrom to the Superior Court. Notice of the appeal shall be ordered by the court and the appeal shall be heard without a jury, with the rights provided by law in other civil actions so heard. The court shall receive in evidence a copy of the findings of fact and of the order of the division and such other evidence as it deems material. The court shall have jurisdiction to affirm or nullify the order of the division, or to remand the proceedings to the division upon such terms as justice may require.

Sec. 7. Enforcement. The Kennebec Water District or the Division of Sanitary Engineering, Department of Health and Welfare, may apply to the Superior Court for appropriate civil relief to enjoin or restrain any violation of this Act.

Effective October 1, 1969

Chapter 121

AN ACT to Appropriate Moneys for the Expenditures of State Government and for Other Purposes for the Fiscal Years Ending June 30, 1970 and June 30, 1971.

Emergency preamble. Whereas, Acts and resolves passed by the Legislature do not become effective until 90 days after adjournment unless enacted as emergencies; and

Whereas, the said 90-day period will not terminate until after the beginning of the next fiscal year; and

Whereas, certain obligations and expenses incident to the operation of departments and institutions will become due and payable on or immediately after July 1, 1969; and

Whereas, in the judgment of the Legislature, these facts create an emergency within the meaning of the Constitution of Maine and require the following legislation as immediately necessary for the preservation of the public peace, health and safety; now, therefore,

Be it enacted by the People of the State of Maine, as follows:

Appropriations for necessary expenditures of government. In order to provide for the necessary expenditures of government and for other purposes for the next two fiscal years—from July 1, 1969 to June 30, 1970 and from July 1, 1970 to June 30, 1971—the following sums or as much thereof as shall severally be found necessary, as designated in the following tabulations, are appropriated out of any moneys in the General Fund not otherwise appropriated. Upon receipt of allotments duly approved by the Governor and Council based upon work programs submitted to the State Budget Officer, the State Controller shall authorize expenditures of these appropriations and revenues accruing thereto, together with expenditures for other purposes necessary to the conduct of State Government on the basis of such allotments and not otherwise.

Allotments for personal services, capital expenditures and amounts for all other departmental expenses shall not exceed the amounts shown in the budget document or as they may be revised by the Committee on Appropriations and Financial Affairs unless recommended by the State Budget Officer and approved by the Governor and Council.

APPENDIX B

Summary of Trustee Survey

APPENDIX B
SUMMARY OF TRUSTEE SURVEY ON STEWARDSHIP PRIORITIES
KENNEBEC WATER DISTRICT

Question No	Survey Question	Trustee A	Trustee B	Trustee C	Trustee D	Trustee E	Trustee F	Trustee G	Trustee H	Trustee I	Trustee J	Sum	Adjusted Score	Priority	Relative Ranking
5	Collection of in-lake and watershed water quality data	10	10	10	10	10	10	10	10	10	10	100	100.0	H	1
1	Maintaining ownership of and/or increasing ownership of China Lake watershed land (land conservation)	10	10	10	10	10	10	10	10	10	6.7	96.7	96.7	H	2
6	Partnerships with existing organizations with similar missions to maintain/improve water quality (e.g., CLA/CRLA, Land Trusts, Road and Other Associations)	NA	10	10	10	10	6.7	10	10	10	10	86.7	96.3	H	3
8	Watershed non-point source pollution correction (funds, manpower, etc.) (erosion, road improvements, inappropriate logging activities, failing septic systems, etc.):	10	10	10	6.7	10	3.3	10	10	10	10	90	90.0	H	4
10	Implementation of local town ordinances to help protect water quality	6.7	10	10	6.7	10	3.3	10	10	10	6.7	83.4	83.4	H	5
7	Security and control surrounding in lake intake structure:	10	3.3	6.7	10	6.7	3.3	NA	10	10	10	70	77.8	M	6
3	Maintaining and enforcing existing “no bodily contact” requirements in the West Basin	3.3	3.3	6.7	10	10	10	6.7	10	6.7	10	76.7	76.7	M	7
4	Reimplementation of KWD authority to review subsurface wastewater disposal permits as granted in 1969 state law	10	10	6.7	6.7	10	NA	3.3	10	NA	3.3	60	75.0	M	8
11	Education of stakeholders (Landowners, recreational users, etc.) within the watershed	6.7	6.7	10	6.7	10	3.3	10	10	3.3	6.7	73.4	73.4	M	9
2	Maintaining and enforcing existing no trespassing requirements on KWD owned lands	6.7	6.7	6.7	10	3.3	3.3	6.7	10	3.3	10	66.7	66.7	M	10
12	Providing KWD funds for various initiatives	NA	6.7	8	6.7	6.7	6.7	6.7	3.3	6.7	3.3	54.8	54.8	M	11
9	In-lake treatment to improve water quality (alum treatment, dredging, oxygenation, etc.):	3.3	3.3	6.7	3.3	3.3	3.3	NA	10	6.7	NA	39.9	49.9	L	12

Notes: High, Medium and Low Priorities were assigned 10, 6.7 & 3.3, respectively.

APPENDIX C

Summary of Concerns & Challenges

APPENDIX C
SUMMARY OF CONCERNS CHALLENGES - WATER QUALITY

Category	Concern/ Challenge	Action Item	Goal	Current Lead Organization	Project Partners	Stakeholders	Comments
Water Quality	Phosphorus & Algal Blooms	Conduct Baseline Water Quality Monitoring in China Lake	Track Trends	KWD	MDEP, CRLA	KWD, MDEP, CRLA, CLA, Towns	
		Sediment P Monitoring		None	MDEP, CRLA	KWD, MDEP, CRLA, CLA, Towns	
		Plankton Monitoring (HAB monitoring ?)	Track Trends	None	MDEP, CRLA	KWD, MDEP, CRLA, CLA, Towns	
		HAB Toxin Monitoring - as needed	Track Trends; Public Health	KWD As Needed		KWD, MDEP,MDWP, CRLA, CLA, Towns, Rec Users	
		Metaphyton Monitoring	Track Trends	None	MDEP, CRLA	MDEP, CRLA, CLA, Towns	
		Inlet Stream WQ Monitoring Plan	Determine P Inputs	None	MDEP, CRLA, colby	KWD, MDEP, CRLA, CLA, Towns, colby	
		Zooplankton Monitoring	Track Trends	KWD	MDEP, CRLA	KWD,MDEP, CRLA, CLA, Towns	
		Fe & Al Sediment Monitoring	Track Trends	None	MDEP, CRLA	KWD, MDEP, CRLA, CLA, Towns	
		Alum Treatment	Reduce Available P	CRLA, CLA, MDEP	MDEP, CRLA	KWD, MDEP,CRLA, CLA, Towns	working on policy stmt
	Invasive Plants	Invasives Monitoring/Inspection	Prevent Introduction of Invasives	CRLA w KWD Support	MDEP, CRLA	KWD, MDEP,MDWP, CRLA, CLA, Towns, Rec Users	Relies on Conservation Youth Corps; Funding Challenges
	Emerging Contaminants	Monitor PFAS and other EC; identify likely sources	reduce/eliminate EC		MDEP, MDWP	KWD	
	Alewife Reintroduction	Monitor Fish Migration, Targeted Water Quality	Establish baseline and track trend	None	DMR	KWD, Towns, MDEP, DMF, IF& W	

APPENDIX C
SUMMARY OF CONCERNS CHALLENGES - GOVERNANCE

Category	Challenge	Action Item	Goal	Current Lead Organization	Project Partners	Stakeholders	Comments
Governance	Security of KWD Intake	Better signage, Enforcement Move/extend intake vs Move Boat Ramp	Protect Intake from spills, damage	KWD	Maine DWP, IF&W, Maine Legislature	KWD	Enforcement is limited by availability of sheriff & wardens
	No Bodily Contact West Basin	Better signage, Enforcement	Protect WQ	KWD	Maine DWP, IF&W, Maine Legislature	KWD	Enforcement is limited by availability of sheriff & wardens
	No Tresspassing on KWD property	Signage, outreach on reason for protection	Protect WQ	KWD	Maine DWP, IF&W, Maine Legislature	KWD	Enforcement is limited by availability of sheriff & wardens
	KWD review of Septic System Permits	Consider KWD Funding support for additional CEO time (China)	Reduce NPS	Town of China	CLA, CRLA	KWD, CRLA, CLA, Towns, Residents	If funding is provided, KWD would want to ensure that it is used for watershed protection
	China: P-Land Use Ordinance Update	Update 1993 Phosphorous Ordinance; Review and Identify Improvements to Protect Water Quality	Reduce NPS from New and Modified Development	Town of China		KWD, China, CRLA, CLA	Update Phosphorous Ordinance Based on 2021 WBMP
	Vassalboro: Shoreland Zoning Ordinance Update	Review and Identify Improvements to Protect Water Quality	Reduce NPS from New and Modified Development	Town of Vassalboro		KWD, Vassalboro, CRLA, CLA	
	Local Ordinance Updates	Education & Outreach to Facilitate Ordinance Updates	Educate on Benefit to Citizens to Protect Water Quality	China & Vassalboro		Towns, KWD, CRLA, CLA	Ordinance development support can be provided by Kennebec Soil & Water, IF&W BwH and Others

APPENDIX C
SUMMARY OF COCERNS CHALLENGES - LAND CONSERVATION

Category	Challenge	Action Item	Goal	Current Lead Organization	Partners	Stakeholders	Comments
Protection of Natural Areas	Development Pressures increase in NPS	Private Land Protection: Protect or conserve land , encourage & facilitate Tree Growth and Open Space participation	Conserve Land to Protect and Improve Water Quality, Reduce NPS	None, High Priority for All Stakeholders	CLA, CRLA, Town, Land Trusts	KWD, CRLA, CLA, Towns	Recommend Trustees Develop Land Conservation Ploicy
	Development Pressures increase in NPS. Limited Land Trust Activity in Watershed	Land Trust Protection: Solicit Interest and Partner with Existing Land Trust(s)	Conserve Land to Protect and Improve Water Quality, Reduce NPS	None, High Priority for All Stakeholders	Kennebec LT 7 Lake Alliance	KWD, CRLA, CLA, Towns	Recommend Trustees Develop Land Conservation Ploicy
	Development Pressures increase in NPS	KWD Land Protection: KWD Purchase Land or Easement	Conserve Land to Protect and Improve Water Quality, Reduce NPS	None, High Priority for All Stakeholders		KWD, CRLA, CLA, Towns	Recommend Trustees Develop Land Conservation Ploicy

APPENDIX C
SUMMARY OF CONCERNS CHALLENGES - EDUCATION OUTREACH

Category	Challenge	Action Item	Goal	Current Lead Organization	Partners	Stakeholders	Comment
Education & Outreach							
	Property Owner Best Practices for SW Protection	Welcome Packet	Improved public understanding; expanding stakeholder support	None	KWD, CLA CRLA, Towns	KWD, CLA CRLA, Towns	
	Staffing for CLA & CRLA Lake Programs	Financial/grant support	Protect water quality & improved public awareness	CLA, CRLA	KWD, CLA CRLA, possibly Towns	KWD, CLA CRLA, Towns; rec users	
	Public support and compliance with SW Protection Strategies	Public Outreach & School Programs	Improved public understanding; expanding stakeholder support	KWD	KWD, CLA CRLA, Towns, MDEP, IFW BwH	KWD, CLA CRLA, Towns	
	Educational Website for Lake/Source Water Protection		Improved public understanding; expanding stakeholder support	None	KWD, CLA CRLA, Towns, MDEP, IFW BwH	KWD, CLA CRLA, Towns; rec users	
	Other Social Media		Improved public understanding; expanding stakeholder support	None	KWD, CLA CRLA, Towns, MDEP, IFW BwH	KWD, CLA CRLA, Towns; rec users	
	KWD Coordination Among Stakeholders and Public Outreach Capacity	KWD Trustees Review Staffing to Support Source Water Stewardship	Develop Staff Capacity to Implement Stewardship Plan & Collaborate with Stakeholders	KWD		All stakeholders	Other Water Districts have dedicated Source Water protection staff

APPENDIX C
SUMMARY OF CONCERNS CHALLENGES - LAND USES

Category	Challenge	Action Item	Goal	Current Lead Organization	Project Partners	Stakeholders	Comments
Land Use Impacts	Reduce NPS inputs	Gravel Road Maintanence	Reduced NPS inputs	Towns of China & Vassalboro	CRLA, CLA, KWD	MDEP, CLA, CRLA, Towns	
	Reduce NPS inputs	Road Sand/Salt Application	Reduced NPS inputs	Towns of China & Vassalboro, MDOT	CRLA, CLA, KWD	MDEP, CLA, CRLA, Towns	
	Reduce NPS inputs	Landscape Buffers	Reduced NPS inputs	Towns of China & Vassalboro	CRLA, CLA, KWD	MDEP, CLA, CRLA, Towns	
	Reduce Point Source inputs	Wastewater maintanence/malfunction	Reduced NPS inputs	Towns of China & Vassalboro	CRLA, CLA, KWD	MDEP, CLA, CRLA, Towns	
	Reduce New Point & Non-Point Source Inputs	Adopt Low Impact Development BMPs	Reduced NPS inputs; limit impervious surface	Towns of China & Vassalboro	CRLA, CLA, KWD	MDEP, CLA, CRLA, Towns	
	Reduce Point Source inputs	Culvert Upgrades	Reduced NPS inputs; improved habitat access; climate resilencency	Town, MDOT	MDEP, CRLA, CLA, KWD	MDEP, CLA, CRLA, Towns	Culvert inventory has been done
	Limited Monitoring & Enforcement Capacity	Support CEO capacity	Improved enforcement	Towns of China & Vassalboro	KWD	MDEP, CLA, CRLA, Towns	
	Preserve Forest Water Quality Protection	Forestry Practices /Logging	SW Protection; Limit erosion & runoff	KWD	DOC	CLA, CRLA, Towns	
	Lake Level	Dam Control	Designate Vassalboro with Lake Level Responsibility	KWD, Vassalboro, MDEP		MDEP, CLA, CRLA, Towns; Rec Users	MDEP to Re-issue Lake Level Order to Vassalboro that owns and controls the dam

APPENDIX D

Potential Stewardship Funding Resources

APPENDIX D
POSSIBLE FUNDING SOURCES TO SUPPORT WATER STEWARDSHIP
KENNEBEC WATER DISTRICT

GRANTS & LOANS	Description	Stewarship Application	Website or Contact
Source Water Protection Grant	Grants will be awarded to projects that demonstrate a commitment to the ongoing protection of a system's drinking water source.	Any aspect of SWP	Maine DWP https://www.maine.gov/dhhs/mecdc/environmental-health/dwp/pws/financialResources.shtml
Water System Asset Security Grant	Systems can receive a grant to plan and/or implement security measures to protect water system assets.	Intake/Boat Ramp Assessment	
Capacity Development Grant	Systems can receive grants for the preparation of documents that will assist them in the maintenance or enhancement of water quality by identifying possible improvements in technical, financial, and managerial operations (capacity development).	Intake/Boat Ramp Assessment; Revisions to statutes ?	
Land Acquisition Loans	Low interest loans for the purchase of land and/or conservation easements needed for source water protection	Land Conservation	
Maine DEP Courtesy Boat Inspection Grants	A cost-share program to help fund locally-supported CBI programs.	Invasive species/ water quality	Maine DEP https://www.maine.gov/dep/water/grants/invasive/index.html
Maine DEP Small Community Grant	Administered by Maine DEP, this program provides grants to municipalities to help replace malfunctioning septic systems that are polluting a waterbody or causing a public nuisance	Water quality - septic systems	Maine DEP https://www.maine.gov/dep/water/grants/scgp.html
US EPA Clean Water Act (Section 319) Watershed Nonpoint Source Grant	Administered by Maine DEP, 319 grants assist communities implementing a watershed-based management plan for waters named on Maine DEP's NPS Priority Watershed List.	Watershed protection and water quality impropvemenrt	Maine DEP https://www.maine.gov/dep/water/grants/319.html
Community Resiliency Partnership Community Action Grant	Grants for climate related planning and implementaion including source water protection, land use ordinace, energy improvements, land conservation, watershed planning , flooding etc.	several applications	https://www.maine.gov/future/climate/community-resilience-partnership/grants
Land for Maine's Future	Funding for the conservation of working forests, farms, and commercial waterfronts, public access to our woods and waters and the protection and management of wildlife.	Land conservation and aquistion	https://www.maine.gov/dacf/lmf/
Town of China TIFF	The Town of China TIF funds have been used to improve public access to China Lake, conduct research related to water quality, and for trail development among other activities.	Water quality & watershed innitaitives	https://china.govoffice.com/vertical/sites/%7B57BBD0A3-55D7-4C7C-8E42-8D085FC781A3%7D/uploads/Blank_TIF_Funds_App.pdf
USDA NRCS	Drinking water protection including concerns about either the quality or quantity of source water or both; can including land conservation for source water protection	Land conservation	https://www.nrcs.usda.gov/programs-initiatives/source-water-protection