Town of Caroga, New York
Lakes Management Plan
February, 2019

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Town of Caroga Lakes Management Plan 2019
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I. Introduction

This plan is intended to serve as a framework for the Town of Caroga to maintain and improve the quality of the lakes within the Town, especially the lakes which receive the heaviest usage. These include: the Canada Lake system (which includes Canada Lake, West Lake, Green Lake and Lily Lake), East Caroga, West Caroga, Pine Lake, Pleasant Lake, and the Stoner Lakes (including East and West Stoner Lakes).

This document outlines a number of recommendations for the long-term protection and improvement of lakes and watersheds within the Town of Caroga. It is a working document to serve as a compass for pursuing projects and policies that will protect and sustain the beautiful lakes and water quality within the Town for the enjoyment of its residents and visitors for many generations to come.

In 2017, the Town formed an Lakes Management Committee (LMC) to help coordinate and plan efforts to detect, prevent, and remove invasive plants in the Town. The LMC developed this Lakes Management Plan to highlight the status of the Town's lakes, identify potential problems, and focus future efforts. The Town will continue to work in partnership with area lake associations, the Fulton County Soil and Water District, the Adirondack Park Invasive Plant Program (APIPP), the New York State Department of Environmental Conservation (DED), the Adirondack Watershed Institute of Paul Smith's College (AWI), the Adirondack Lake Alliance (ALA), and the New York State Federation of Lake Associations (NYSFOLA) to implement this plan to protect water quality in Town Lakes.

[Note: The Mohawk River Watershed Coalition is currently working on implementing its comprehensive watershed management plan. The Town of Caroga will review the recommendations of the Mohawk River Watershed's management plan when it becomes available to consider any recommendations relevant to the lakes in the Town and revise this plan as needed.]

II. Community Input

The plan was developed by the Town's Invasive Species Committee which includes representatives of the Town and the lake associations from Canada and Caroga Lakes. The Town welcomes ongoing input and suggestions regarding the plan from the public.

The plan was guided by the Town of Caroga Comprehensive Plan developed in 2011. The development of that plan included a formal public input process and extensive planning committee input that resulted in several important recommended measures to protect water quality. The Comprehensive Plan emphasized its commitment to protect the quality of the Town's lakes:

> *"One of Town's most important assets is its numerous lakes. Maintaining a high water quality in these lakes must be a high priority for the Town of Caroga. The high density of development coupled with the age and type of individual wastewater treatment systems and the many small lots around certain lakes creates a situation that could negatively affect water quality. The Town of Caroga needs to be proactive and take the steps necessary to regulate and control new development and the conversion of camps into year round housing units around lakes to protect and preserve the water quality of the Town's lakes."*

Several specific recommendations to protect the lakes were included in the Comprehensive Plan:
-monitoring water quality (including indicators of temperature, pH, dissolved oxygen, total nitrogen, total phosphorus, turbidity, total suspended solids and fecal coliform bacteria).
-implementing a strong and aggressive water quality program that will create excellent water quality in all of the Town's lakes.
-developing a lakes management plan.
-preparing a cost analysis for a sanitary sewer system.

(source: Town of Caroga Comprehensive Plan, 2011 Town Planning Board.)

III. Description of the Town of Caroga Lakes

The lakes and streams in Caroga are part of the Mohawk Watershed. The lakes that are most heavily populated and utilized for recreational purposes include the Caroga Lakes, Canada Lakes, Pine Lake, and the Stoner Lakes. A full inventory of lakes is provided in Attachment A.

Major lakes and watershed systems include:

East and West Caroga Lakes
These lakes are fed by several small streams and springs and have an outflow into the Caroga Creek which flows into the Mohawk River.
Access to the lake for boaters includes the beach launch at the DEC Caroga Lake Campground located off of Route 29A, 9 miles northwest of the City of Gloversville. This campground has a beach launch and parking for 15 cars and trailers. In addition, a private launches exists at the Caroga Lake Marina located adjacent to the bridge and channel between East and West Caroga Lake and the launch for the for the East Caroga Lake Association.

Canada Lake system
This includes Canada Lake, Green Lake, West Lake, Lily Lake and Stewarts Landing. These lakes are fed by several small streams emanating from Pine Lake, Stoner Lake, Nine Corner Lake, Otter Lake, and Irving's Pond. The Canada Lake system has an outflow into the Sprite Creek which flows into the East Canada Creek and eventually into the Mohawk River.
There is no boat launch on Canada Lake; however there is a DEC fishing access site with a hard surface ramp on West Lake which connects to Canada Lake. The West Lake launch is located off route 29A/10, one mile south of the intersection of Routes 29A and 10 on the Point Breeze Road. The single lane hard surface ramp has parking for 15 cars and trailers. In addition, there is a private launch located at the Canada Lake Store and Marina on Route 29A/10.

Pine Lake
This lake is located one mile west of West Lake. Pine Lake is a stream emanating from Indian Lake and area small streams and springs and is a tributary to Sawdust Creek which flows into West Lake.

The Stoner Lakes
These lakes include East, West and Middle Stoner Lakes. They are fed by several local streams and springs and feed into a stream that eventually runs into Sawdust Creek which flows into West Lake.
The majority of public access to the lake comes through the use of a public right of way and informal launching area at the northwest end of the lake on Pine Lake Road adjacent to Route 10.

IV. Lake Water Quality

Impacts of sewage disposal
All wastewater is disposed of into private septic systems. As noted in the Town Comprehensive Plan, the concentration of homes and camps around West and East Caroga Lakes has been a concern of town government. The main cause of concern is the potential impacts that the concentration of old septic systems may be having on water quality in West and East Caroga Lakes.

A. Monitoring Quality of Water

The Town and several of the lake associations have been monitoring the quality of the water in several of the lakes through participation in the Adirondack Lake Assessment Program and The Citizens Statewide Lake Assessment Program (CSLAP). In addition, Middle Stoner Lake was assessed in 2010 through the DEC Lake Classification and Inventory (LCI).
(see: http://www.dec.ny.gov/docs/water_pdf/lcirpt10mstonerl.pdf)

The Town and lake associations have also supported lake weed inspections periodically conducted by the Aquatic Regional Response Team of the Adirondack Water Institute (AWI) from Paul Smith's College. These water quality monitoring efforts are providing annual water quality data on several of the lakes as well as identifying weed bed locations for the Canada Lakes, East and West Caroga Lakes and Pine Lake.

1. Adirondack Lake Assessment Program (ALAP)

ALAP uses volunteers from Canada Lake, Pine Lake, East Caroga and West Caroga Lake to collect and report on water quality indicators including: pH, conductivity, apparent color, Chlorophyll-a, Total Phosphorous, Chloride, Calcium and Sodium.

Canada Lake has participated since 2003. Pine Lake has participated since 2001. East Caroga Lake and West Caroga Lake started participating in 2016. This is a high quality longitudinal scientific study with more than 75 Adirondack lakes participating in 2016. All lakes are sampled by volunteers at the same time, usually three times each summer season.

The 2017 ALAP reports for Canada Lake, Pine Lake, West Caroga Lake and East Caroga Lake show the water quality to be high (see Summary of ALAP Results for 2017 below).

ALAP results for West Caroga Lake and Canada Lake for 2017 flagged sodium and chloride problems associated with the use of road salt as a potential problem. Specifically, sodium and chloride values for the West Caroga Lake were 8.2 and 16.0 mg/L in 2017, indicating that the chemistry of the lake is moderately influenced by road salt. Chloride concentration in West Caroga is greater than 83% of the participating lakes and is approximately 88 times higher than background concentrations for least impacted lakes of the Adirondack region.

Sodium and chloride concentrations in 2017 for Canada Lake were 3.8 and 7.6 mg/L respectively, suggesting that the chemistry of the lake is influenced by the 35.2 km of roads in the watershed. Chloride concentration in Canada Lake is exhibiting a significant increase and is currently greater than 67% of lakes participating in ALAP.

a. Summary of ALAP Results for 2017

[source: Laxson, C.L., Yerger, E.C., Favreau, H.A., Regalado, S.A., and D.L. Kelting. 2018. Adirondack Lake Assessment Program: 2017 Update. Paul Smith's College Adirondack Watershed Institute. Report No. PSCAWI 2018-04. 169p. *Corresponding author Corey Laxson at claxson@paulsmiths.edu]

Canada Lake is a 294 hectare lake located in Fulton County in the Town of Caroga. This lake is located within a 9,040 hectare watershed dominated by forests. Canada Lake has been monitored by ALAP volunteers and the Adirondack Watershed Institute since 2000.

- Canada Lake is best classified as a mesotrophic lake. The trophic state of the lake has been variable, but typically fluctuates around the oligotrophic – mesotrophic boundary. We did not detect a significant trend in any of the trophic indicators.
- Water samples from 2017 were found to be circumneutral in terms of their acidity, with an average pH of 6.6 units. We observed the alkalinity in August to be 6.0 mg/L, indicating that the lake has moderate sensitivity to acid deposition.
- Sodium and chloride concentrations in 2017 were 3.8 and 7.6 mg/L respectively, suggesting that the chemistry of the lake is influenced by the 35.2 km of roads in the watershed. Chloride concentration of Canada Lake is exhibiting a significant increase and is currently greater than 67% of lakes participating in ALAP.

East Caroga Lake is a 94 hectare lake located in Fulton County in the Town of Caroga. The lake is located within a 1,490 hectare watershed dominated by forests. East Caroga joined the ALAP program in 2016.

- East Caroga is best characterized as a mesotrophic lake.
- The lake is circumneutral in terms of its pH, and averaged 7.5 pH units in 2017.
- Alkalinity in 2017 was 26.2, indicating that the lake is not sensitive to acid deposition. Alkalinity of East Caroga is greater than 88% of participating ALAP lakes in 2017.
- Sodium and chloride values for the lake were 12.6 and 24.7 mg/L in 2017, indicating that the chemistry of the lake is highly influenced by road salt. Chloride concentration in East Caroga is greater than 94% of the participating lakes and approximately 120 times higher than unimpacted lakes in the Adirondacks.
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Pine Lake is a 67 hectare lake located in Fulton County in the Town of Caroga. The lake is located within a 1,129 hectare watershed dominated by forests. Pine Lake has been monitored by ALAP volunteers and the Adirondack Watershed Institute since 2001.

- Pine Lake is an oligotrophic Lake. Transparency depth, and the concentrations of total phosphorus, and chlorophyll-a have not exhibited any statistical trends since monitoring began 2001. The secchi transparency of Pine Lake averaged 4.8 meters, which was greater than 87% of participating ALAP lakes in 2017.
- Water samples from 2017 were found to be circumneutral in terms of their acidity, with an average pH of 7.0 units. The pH of the samples has exhibited a statistically significant increasing trend, at a rate of approximately 0.09 pH units/year. Alkalinity averaged 2.6 mg/L, indicating that the lake has moderate sensitivity to acid deposition.
- Sodium and chloride concentration averaged 0.6 and 0.7 mg/L in 2017, indicating the chemistry of the lake is not significantly influenced by road salt, in fact, chloride concentration as well as the conductivity of the lake have been trending down since 2001.

West Caroga Lake is a 129 hectare lake located in Fulton County in the Town of Caroga. The lake is located within a 1,019 hectare watershed dominated by forests. West Caroga has participated in ALAP since 2016. Trend analysis on the key water quality indicators will be performed after a minimum of five years of data collection.

- West Caroga is best classified as an oligotrophic lake on the border of mesotrophy.
- The lake is circumneutral in terms of its pH, with an average pH of 7.2 units in 2017. The alkalinity was 16.2 mg/L, indicating that the lake is well buffered against changes in pH with a low sensitivity to acid deposition.
- Sodium and chloride values for the lake were 8.2 and 16.0 mg/L in 2017, indicating that the chemistry of the lake is moderately influenced by road salt. Chloride concentration in West Caroga is greater than 83% of the participating lakes and is approximately 88 times higher than background concentrations for least impacted lakes of the Adirondack region.

2. Citizens Statewide Lake Assessment Program (CSLAP).

The Town and volunteers from several lake associations for Canada Lake and East Caroga Lake, work with Citizens Statewide Lake Assessment Program (CSLAP) which is a volunteer lake monitoring and education program managed by DEC and New York State Federation of Lake Associations (NYSFOLA). DEC and NYSFOLA train volunteers who collect water samples every other week for 15 weeks during the summer for lab analysis and record the following information: weather conditions, water temperature, water transparency, lake depth, recreation quality of the lake, and algal conditions based on the user's perception.

The most recent CSLAP reports for Canada Lake* and East Caroga Lake indicate generally high quality characteristics for these lakes. The reports also confirmed the continued presence of Eurasian Milfoil in East Caroga Lake.

*Note: For Canada Lake CSLAP reports are consistent with the 2013 study done for the Canada Lakes system (including Canada Lake, West Lake and Green Lake) by the Darin Water Institute.
(See: Aquatic Vegetation of Canada Lake, West Lake and Green Lake, Town of Caroga, New York Prepared By Lawrence Eichler, Research Scientist & Charles Boylen, Associate Director, Darrin Fresh Water Institute, 5060 Lakeshore Drive, Bolton Landing, NY 12814 (518) 644-3541 (voice) (518) 644-3640 (fax) eichll@rpi.edu October 15, 2013 DFWI Technical Report 2013-6).

The summary results of the CSLAP reports are noted below.
[For copies of detailed CSLAP reports for Canada Lake and East Caroga Lake see: NYS DEC Fulton County Water Reports: Citizens Statewide Lake Assessment Program (CSLAP) Reports. https://www.dec.ny.gov/lands/77870.html]

a. CSLAP 2017 Results:

Canada Lake Summary 2017:
(source-http://www.dec.ny.gov/docs/water_pdf/cslrpt17canadal.pdf)

2017 compared to prior years: Canada Lake continues to be typical of mesoligotrophic (moderately unproductive) lakes. Water clarity was slightly lower than usual in 2017, probably due to higher than usual algae levels. Water temperature was also lower than usual, despite the higher algae levels.
Compared to nearby lakes: Canada Lake has higher water clarity and lower nutrient and algae levels and conductivity readings than most nearby lakes, in part due to greater water depth. Chloride levels are in the range of background levels for New York state lakes, indicating little potential for aquatic life impacts from road salt.
Trends: pH readings have increased slightly over the last twenty years, and deepwater temperatures have decreased over the same period (although this might be due to variations in sample depth). Each of the other water quality indicators have been stable and/or varied only slightly in the last two decades.
Algal blooms and HABS: Water quality conditions indicated a low susceptibility to blooms, and no shoreline or open water blooms have been reported. Algae levels do rise slightly during the summer, but the algae community is comprised of a mix of algae species. Aquatic invasive species: There are no known AIS on Canada Lake, although Eurasian watermilfoil and other invasive aquatic species have been documented in some nearby lakes. The proximity to nearby AIS sites and public access to the lake indicates some degree of vulnerability to AIS.
Indicated Actions: Individual stewardship activities such as pumping septic systems, growing a buffer of native plants next to the water bodies, and reducing erosion from shoreline properties and runoff into the lake will help to improve lake health by reducing nutrient and sediment loading to the lake. Visiting boats should be inspected to reduce the risk of new invasive species, since nearby lakes harbor several invasive plants not presently found in this lake. Continued monitoring for invasive species is warranted. Continued algae bloom education and monitoring for HABs is recommended, even though blooms have not been reported on the lake.

East Caroga Summary 2017:
(source-http://www.dec.ny.gov/docs/water_pdf/cslrpt17eastcarogal.pdf)

2017 compared to prior years: East Caroga Lake continues to be a *mesoligotrophic*, or moderately unproductive lake. This is based on very low nutrient levels and intermediate

algae levels and water clarity. Water clarity was lower than usual in 2017, but so were algae levels, suggesting normal variability. Conductivity readings were higher than usual.
Compared to nearby lakes: East Caroga Lake has water clarity similar to other western Adirondack region lakes, despite slightly lower nutrient and algae levels. Aquatic plant coverage is slightly higher than in many of these other lakes, although this is influenced by active management. Chloride levels are in the 50th to 75th percentile for New York lakes, suggesting some potential for aquatic life impacts from road salt. However, no impacts have been apparent.
Trends: Conductivity has increased significantly in the last two decades. NOx readings and deepwater temperatures have also risen, but this increase is not statistically significant.
Algal blooms and HABS: Water quality conditions indicated a low susceptibility for algae blooms, although some shoreline blooms (comprised of *Microcystis*) have been reported in previous years. These blooms have been small and ephemeral, with low toxin levels. Algae levels in the open water are
low and comprised of a mix of algae species. No shoreline blooms were reported in 2017.
Aquatic invasive species: Eurasian watermilfoil has been managed in East Caroga Lake for many years, indicating a high vulnerability for new AIS introductions. This may be due to the availability of public access and proximity to other lakes with AIS.
Indicated Actions: Individual stewardship activities such as pumping septic systems, growing a buffer of native plants next to the water bodies, and reducing erosion from shoreline properties and runoff into the lake will help to improve lake health by reducing nutrient and sediment loading to the lake. Visiting boats should be inspected to reduce the risk of new invasive species, since nearby lakes harbor some invasive plants not presently found in this lake. Continued monitoring for invasive species is warranted. Continued algae bloom education and monitoring for HABs is recommended, particularly given the periodic observation of small blooms along the shoreline.

3. Lake Classification and Inventory (LCI) Reports for 2010

As part of its Lake Classification and Inventory (LCI), DEC conducted a review of Middle Stoner Lake in 2010 which indicated that the water quality was good with no invasive species being detected.

(Source:: http://www.dec.ny.gov/docs/water_pdf/lcirpt10mstonerl.pdf)

4. 2015 Adirondack Watershed Institute (AWI) Lake Inspections

During the summer of 2015 the AIS regional response team conducted comprehensive aquatic plant surveys of East Caroga Lake, West Caroga Lake, Canada Lake, Canada Lake Outlet, and Pine Lake. Visual surveys and rake tosses were performed from canoes as well as by snorkeling. Using these techniques, the team surveyed the entire littoral zone of each lake in a serpentine search pattern and mapped the location, species composition, and species cover of all aquatic plant beds discovered.

The results from 2015 AWI Lake Inspections are noted below:

(source: Adirondack Aquatic Regional Response Team 2015 Report, Paul Smiths College, https://www.adkwatershed.org/sites/default/files/regional_response_team_report_2015.pdf)

Canada Lake Results

A total of 42 aquatic plant beds were mapped in Canada Lake covering 277.0 acres of surface water, 22% of the lake area. The most abundant aquatic plant taxa found were *Eleocharis parvula*, *Sparganium sp.,* and *Sagittaria graminea.* The least abundant aquatic plant taxa found were *Potamogeton ampifolius, Nitella sp.,* and *Isoetes sp.* (Figure 7-8). A total of 43 rakes were tossed, of which 15 returned plant specimens. The most abundant aquatic plant taxa returned by the rakes were *Utricularia vulgaris, Sparganium sp. and Utricularia intermedia.* The least abundant aquatic plant taxa returned by the rake tosses were *Brasenia schreberi, Vallisneria americana,* and *Potamogeton natans*.

No AIS were found in Canada Lake.

Caroga Lakes Results

A total of 19 plant beds were mapped in the Caroga Lakes covering 99.4 acres of surface water, 17.8% of the lake area. The most abundant aquatic plant taxa found were *Brasenia schreberi*, *Myriophyllum spicatum,* and *Eriocaulon sp.* The least abundant aquatic plant taxa found were *Potamogeton gramineus, Utricularia intermedia,* and *Potamogeton praelongus* (Figure 10). A total of 78 rakes were tossed, of which 34 returned plant specimens. The most abundant aquatic plant taxa returned by the rake were *Potamogeton ampifolius, Eleocharis parvula and Utricularia vulgaris.* The least abundant aquatic plant taxa returned by the rake tosses were *Potamogeton epihydrus, Utricularia purpurea,* and *Najas sp.*

One AIS was found during the survey: *M. spicatum* (Eurasian water-milfoil). *M. spicatum* was detected in 15 plant beds covering 83.5 acres, 84% of all plant beds and 15% of surface water. *M. spicatum* is a common AIS in the Adirondacks. No invasive plankton was detected.

Pine Lake Results :

A total of 9 plant beds were mapped in Pine Lake covering 24.3 acres, representing 13.7 % of surface water. The most abundant aquatic plant taxa found were *Nymphaea odorata*, *Eleocharis parvul ,* and *Brasenia schreberi.* The least abundant aquatic plant taxa found were *Potamogeton natans, Sparganium sp.,* and *Utricularia intermedia* (Figure 74). A total of 41 rakes were tossed, of which 21 returned plant specimens. The most abundant aquatic plant taxa returned by the rake were *Eleocharis parvula*, *Utricularia purpurea,* and *Utricularia vulgaris.* The least abundant aquatic plant taxa returned by the rake toss were *Nymphoides cordata, Brasenia schreberi,* and *Nymphaea odorata.*

No AIS were found in Pine Lake

V. Prevention and Removal of Invasive Plants

A. Eradicating Aquatic Invasive Species

The Town of Caroga has had over twenty years of history working with the East Caroga and West Caroga Lake Associations to detect and eradicate invasive aquatic species. Efforts began with the discovery of Eurasian Milfoil infestations in East and West Caroga Lakes and resulted in the implementation of a Diver Assisted Suction Harvesting (DASH) program that has reduced the spread and limited negative impacts on the enjoyment and quality of these lakes.

The Town runs a barge with removal equipment that is staffed by diver and tender teams and managed by the Town Weed Officer. The program begins in mid-May with diving starting on Memorial Day weekend and program wrap up on Labor Day.

Prior to 2018 our team consisted of 4 divers and 1 tender operating 5-6 hours a day, 5 days per week. Beginning in 2018, our team consisted of 8 divers and 2 tenders working a total of 10 hours per day, 5 days per week. In 2017 the Town also doubled its resources and tenders to expand removal of milfoil. In the future, the Town plans to implement the use of booms and other technologies to make the weed eradication efforts more effective.

The table below provides the results of the Town's increased efforts to eradicate Eurasian Milfoil in East Caroga and West Caroga Lakes over the last three years.

Year	**Bushels of Milfoil removed**	**Pounds of Milfoil**	**Tons of Milfoil removed**
2016	1,556	14,782	7.4
2017	4,489	42,645	21.3
2018	6,964	66,158	33

In 2017, the Town also began using the BioBase Mapping System which is a Geographic Information System (GIS) to more accurately map weed beds and monitor removal actions to track effectiveness and weed growth patterns. Information collected by the Town and APIPP about weed removal and weed bed location is shared through this data base to accurately track the growth of Eurasian Milfoil beds. This will provide a base line for subsequent activities.

B. Aquatic Invasive Speicies (AIS) Education Efforts

Several local lake associations have worked with the Town to implement ongoing efforts to educate boaters about the clean, drain, and dry strategy, about the appearance of invasive plants, and about how to implement weed inspection programs. The Town Stewards placed at the boat launching sites at West Lake and Caroga Lake Marina provide boaters with flyers, refer boats needing to be cleaned to the Town boat decontamination station, and encourage to clean their boats. Efforts have also included provision of education sessions at Association meetings and posting of educational information on Association websites to educate members. Many members of local lake associations have attended regional training sessions offered through APIPP.
In 2016-18 the Town and CLCA reached out to other area Lake Associations including Pleasant Lake, Stoner Lake, the Caroga Lakes and neighboring Pecks Lake to educate

campers about invasive aquatic species, this included sharing information and encouraging use of the Town boat wash station.

In 2016 the Town and the Fulton County Soil and Water District hosted a county wide forum on prevention of aquatic invasive plants in Caroga attended by over 50 interested parties including representatives of lake associations, Town, County and State officials, the Hudson/Black River Regulating District, APIPP, and DEC.

The CLCA and the Town have sponsored participation in volunteer steward training for many years and in 2017, the Town and CLSA partnered with APIPP to host a regional Aquatic Invasive Species Identification and Survey Training Session conducted by APIPP.

C. Steward Program to Prevent Aquatic Invasive Species

In 2009, the Canada Lakes Conservation Association, established a stewardship agreement with the DEC to manage a boat inspection program at the DEC Fishing Access site at West Lake
This effort was done to help keep aquatic invasive species out of the Canada Lake system. It was coupled with a volunteer program to inspect the weed beds in the Canada Lakes (see Inspection Program below).

The CLCA now works in partnership with the Town to manage the Steward Program which now stations trained stewards at West Lake, the Decontamination Station, and Caroga Marina to inspect boats during peak utilization hours.

The West Lake site is the only public free place to launch boats serving the Canada Lakes system and handles a significant number of boats for lake campers and visitors. The use of the West lake launch has grown steadily, as more boaters are using the Canada Lakes and the program has been expanded. With the support of the Town, two paid stewards were added to help expand coverage of the West Lake site. In 2017, this effort was expanded to implement a boat decontamination station located on the Adirondack gateway routes of 29A/10 in Wheelerville (*see Decontamination Station section below*). In 2018, the program was expanded to provide boat inspections and education at the Caroga Lake Marina. The program now has were three paid staff and 16 volunteers.

During 2009, the first year of operations, the program inspected 560 boats but in 2018 the Steward program in inspected 2,206 boats and educated 4,015 visitors. Additional information on the 2018 Steward Program is provided in the table below.

1. 2018 Report from Town Steward Program

Location	Visitors educated	Boats observed	Boats inspected	Decontaminations	Boats w/organisms	Boats w/AIS	Total AIS	Eurasian Watermilfoil	Zebra Mussel
Canada Lake	2841	1649	1643	--	10	2	2	1	1
Caroga Decon	396	226	226	113	4	4	4	3	1
East Caroga Marina	778	337	337	--	8	6	6	6	0
Totals	**4015**	**2212**	**2206**	**113**	**22**	**12**	**12**	**10**	**2**

More detailed data collected by Stewards and the decontamination station were reported to AWI at Paul Smiths. The most recent report available from AWI is for 2017. See the Adirondack Watershed Institute of Paul Smith's College Stewardship 2017 Final Report. Summary data from the AWI 2017 report showed that the Steward Program was very effective in educating boaters, inspecting and cleaning boats:

-1,922 boats were inspected.
-4,943 individuals visited the steward sites.
-1.8% of the boats failed inspection
-92% of boaters interviewed by stewards indicated they had an awareness of AIS and
-56% of boaters interviewed at the decontamination indicating awareness of AIS.
-AIS were intercepted by Stewards or the Decontamination Station. The AIS found included: elodea, Eurasian watermilfoil, and zebra mussels.
-Data showed that the waterways of origin for many (88) of the vessels launched in the Town come from lakes known to have AIS. Primary outside waterways included the Great Sacandaga Lake and Mohawk River. This emphasizes the need for a strong ongoing Steward Program.

2. Town of Caroga Lake Seward Results for 2017

Watercraft	Boat Type									total #boats observed	total #boats inspected
	Barge	Canoe	Dock	Kayak	Motor	PWC	Row	Sail	SUP		
Canada Lake	0	129	0	957	790	78	9	6	6	1975	1665
percentage of total boats	0%	7%	0%	48%	40%	4%	0%	0%	0%	100%	84%
Caroga Decon	0	35	0	61	135	19	6	2	0	258	257
percentage of total boats	0%	14%	0%	24%	52%	7%	2%	1%	0%	100%	100%
totals	**0**	**164**	**0**	**1018**	**925**	**97**	**15**	**8**	**6**	**2233**	**1922**
percentage of total boats	**0%**	**7%**	**0%**	**46%**	**41%**	**4%**	**1%**	**0.4%**	**0.3%**	**100%**	**86%**

Boats observed at launch, including those not inspected. PWC=personal watercraft, SUP=stand-up paddleboard.
(source: https://www.adkwatershed.org/sites/default/files/awisp_program_summary_2017.pdf)

D. Invasive Terrestrial Plants

Invasive terrestrial species can cause or contribute to:

- Habitat degradation and loss
- The loss of native fish, wildlife and tree species
- The loss of recreational opportunities and income
- Crop damage and diseases in humans and livestock
- Risks to public safety

APIPP collects information on invasive terrestrial plants observed within the Adirondack PRISM. Plants identified are mapped through a GIS system. For a current map of terrestrial invasive plants that have been reported in the Town of Caroga and the Adirondacks see: http://adkinvasives.com/Invasive-Web-Map/index.html

As of 2017, the invasive terrestrial plants that have been identified along roadways and waterway adjacent to various lakes in the Town include: Japanese knotweed, Phragmites, Purple loosestrife, Bush honeysuckle, Autumn olive, Yellow iris, and Reed canary grass.
The Canada Lakes Conservation Association and the Town have locally distributed information about invasive terrestrial plants for the last several years. In 2017, the Town hosted and participated in a training and certification program on terrestrial plant removal for regional State DoT workers.

E. Lake Inspector Programs:

Since 2009 the Canada Lakes Conservation Association has worked with the Adirondack Park Invasive Plant Program (APIPP) to monitor the Canada Lakes with a trained team of volunteer lake inspectors that annually monitor for the emergence of any invasive plans through the use of rake tosses and visual inspections. Reports of results are reported to the APIPP.

Volunteers from Stoner Lake and from neighboring Pleasant Lake have attended training and implemented are in the process of implementing lake inspection program.

In addition, inspection of the Caroga Lakes occurs during the DASH program, and inspections of Pine Lake and the Stoner Lakes occurs periodically through the CSLAP, ALA, APIPP Rapid Response surveys, or Lake Classification and Inventory surveys.

F. Town Boat Decontamination Station
The Town of Caroga has a boat Decontamination Station that is part of a system of detection and prevention that includes placement of trained stewards at the West Lake Boat Launch and a partnership with the Caroga Marina. The launch and marina inspect boats and refer those needing to be cleaned to the boat wash. In 2016, the Town and CLCA worked with the Fulton County Soil and Water District to obtain funding through a matching grant from the New York State Department of State Local Waterfront Revitalization Program to the Mohawk River Watershed Coalition. This supported the partial cost of the boat washing station. With assistance and support provided through APIPP, AWI, the New York State Department of Transportation (DoT), and DEC the Town sited the boat washing station on routes 29A/10 across from the Town Hall in time for the 2016 boating season. The site was excavated, a driveway and wash area were

developed, a shed to house the wash unit and equipment was constructed, utilities including power and water were hooked up, and road signage, provided through the DoT, was placed on the adjacent highway. Signs and flyers promoting the free boat wash for removal of invasive species were placed at key points throughout the Caroga area. The Canada Lakes Conservation Association and Town partnered to develop a grant application for DEC Invasive Species. A grant was awarded by DEC for the period of April 2016- March 2019 and enabled the Town to fully staff the decontamination station.

Data on the activities at the Decontamination Station are collected and reported to AWI and show an increase in the use of the facility.

(see: https://www.adkwatershed.org/reports/regional-stewardship-reports)

VI. Town of Caroga Lakes Management Plan Goals

1. Monitoring Water Quality of Lakes:

A. The Town and Lake Associations will continue to participate in CSLAP and ALAP (this provides ongoing water quality monitoring for Canada Lake, East Caroga Lake, and Pine Lake.

B. The Town will encourage West Caroga Lake, Pine Lake and Stoner Lakes to participate in the CSLAP program.

C. The Town will continue to partner with the AWI periodic lake inspections and the DEC's Lake Classification and Inventory (LCI) program to inspect the water and vegetation characteristics of the primary lakes in the Town of Caroga.

2. Removal of Aquatic Invasive Species:

A. The Town will continue and expand its aggressive program of systematic DASH removal of milfoil from the Caroga Lakes during the summer weed season. The Town will continue to work with APPIP, AWI and DEC to map and monitor the progress of removal efforts. The Town provides a barge, removal equipment, divers and tender teams, and a coordinator to implement this seasonal effort.

B. The Town will support the efforts of the Fulton County Soil and Water District to encourage neighboring lakes that have invasive aquatic species (Peck's Lake and the Great Sacandaga Lake) to undertake or increase efforts to remove and prevent invasive species.

3. Encourage implementation of actions to improve lake health by reducing nutrient and sediment loading to the lake which include:

a. <u>Minimizing Sewage Impact:</u>

1. Engineering studies conducted by the Town resulted in the recommendation for the construction of a waste water facility for the densely populated areas near the Caroga Lakes. The cost of construction has limited the ability to pursue this option. In 2019, the

Town of Caroga Board authorized the submission of a grant application within the New York State Consolidated Funding Application (CFA) grant process in 2019 to prepare a Preliminary Engineering Report for a Central Sewer System.

In the meantime, the Town will encourage individual stewardship activities such as pumping septic systems and enforce local rules for home septic systems.

2. Encourage property owners to grow a buffer of native plants next to the water bodies.

b. Reducing Erosion:
The Town will encourage property owners to reduce erosion from shoreline properties and runoff into the lakes.

6. Prevention and Detection and Removal of Invasive Species:

A. The Town will support continued monitoring for invasive species through the boat steward program at West Lake, the Caroga Marina and the decontamination unit.

B. Expansion of the Steward Program to educate boaters and inspect boats at the DEC Caroga campsite beach launch.

C. Continued algae bloom education and monitoring for harmful algae blooms is recommended, particularly given the periodic observation of small blooms along the shoreline even though such blooms are non-existent or infrequent in the lakes assessed.

D. In 2019, the Town will work with the Regional Steward Program managed by AWI to place two Stewards in the Town's boat inspection system. This will expand the current system to include stationing a Steward at the DEC Caroga Lake Campsite Boat Launch.

E. The Town will continue to work with area Lake Associations and area marinas to educate boaters to clean, drain and dry their water craft to prevent the spread of invasive species and screen and refer appropriate boaters to the decontamination station as needed.

F. The Town together with the Fulton County Soil and Water District will encourage a county wide approach to preventing, detecting, and removing invasive species.

G. The Town will continue to encourage all lake associations within the town to implement volunteer lake inspection programs and will continue to work with APIPP to support the training of lake inspectors and to collect annual data for APIPPs Invasive Species tracking system.

7. Reduction of Sodium and Chloride Infiltration:

Road salt is essential to maintaining road safety. However, increasing levels of sodium and chloride have been detected in the Canada and Caroga Lakes. This can have a negative impact on residential water supplies, aquatic life, and lake health.

The Town will work with the Town Highway Department, County Highway Department, and NYS DoT to explore methods of more efficiently using road salt and explore safer

alternatives to road salt.

8. Invasive Terrestrial Plants:
A. The Town will work with APIPP, DEC, the Fulton County Cooperative Extension, and Fulton County Soil and Water to educate residents and visitors, locate, monitor, and to eradicate invasive terrestrial plant infestations near key lakes and waterways.

B. The Town will seek additional training on techniques for removing invasive terrestrial plants.

C. The Town will contact the APIPP Rapid Response Team, as needed, to seek technical assistance on removal of infestation of invasive terrestrial plants.