

**Mirror Lake MSBU
Report for Fiscal Year 2011-2012
October 1, 2011 through September 30, 2012
Review Meeting Held: July 25, 2012**

County Staff: Gloria Eby, Thomas Calhoun, Carol Watral

Community Liaisons: John Culmer, Lorene Deviese, and Debbie Roberts

Purpose: To review status of waterbody management and to discuss with the liaison group the recommendations and plans for the next fiscal year..

Routine updates of inspections/results are provided to the community liaison members via email. To be included in these updates, please notify Gloria Eby, Lake Management Program (LMP) Manager, at geby@seminolecountyfl.gov.

Annual Meeting Synopsis:

Lack of access to the lake due to low water level was discussed. LMP noted that in July of 2012 access should again be feasible by both LMP and the contractor for herbicide maintenance services. Noted in previous inspections (at time of meeting) were large amounts of barnyard grass on the south side of the lake that had established due to the drought.

A liaison stated that copious amounts of various types of trash, including sediments, are making their way into the lake and often end up in her area. LMP explained the potential of installation of leaf baskets; however, they are costly at \$1,200 each to install and the on-going expense of maintenance. Current MSBU funding would not support their purchase and installation at this time. LMP explained that some of the sediments identified in the area were a part of the natural lake bed that was exposed due to extreme low water conditions.

The plan for the upcoming FY is to continue with monthly treatments (skipping the months of January and February) for the entire shoreline, and hydrilla spot treatments when necessary. The monthly services were discussed, which includes torpedo grass and water lily treatments. Per the County's FWC Aquatic Plant Control Permit, only lilies in water-depths greater than four (4) feet are permitted to be treated.

Liaisons announced they may schedule an "owner's meeting" in the future. LMP and/or MSBU would be pleased to attend if their presence is desired by the community.

Liaisons report no otter sightings within the last six to eight months.

Violations of prohibited fishing in Mirror Lake by residents of Barrington at Mirror Lake Apartments have decreased due to Barrington management enforcement, per the liaisons.

LMP will supply and install "aquatic hitchhiker" signs at the HOA lot on Mirror Lake to remind everyone how critical it is to inspect their boat and trailer and to remove pieces of

vegetation that may be “hitchhiking”. This will help to prevent the spread of invasive and aggressive vegetation such as hydrilla.

Non-ad valorem assessments for FY 2012-2013 will remain at the current amount of \$250.00 per parcel.

County Funding:

While the MSBU assessment includes a nominal charge for administering the MSBU, the amount charged does not cover all the expenses incurred by the County on behalf of the waterfront property owners. Mirror Lake is extensively monitored by LMP on a monthly basis to assess the aquatic plant growth. This includes oversight of the aquatic herbicide contract for the treatment of emergent non-native vegetation (such as torpedo grass) and floating lilies that may impede access. LMP provides continued evaluation of grass carp mortality and stocking rates, continued evaluation of the submersed aquatic plant species such as hydrilla, provides community updates on the status of all treatments and waterbody assessments, and provides watershed outreach/educational opportunities to the surrounding citizens. In addition, LMP offers free aquatic plant material (as available) for sponsored restoration events and local community volunteers coordinated through the county’s Seminole Education and Restoration Volunteer (SERV) Program. Many of the services provided by the LMP are made available to support community riparian stewardship without additional charges being assigned to the MSBU budget.

2011- 2012 Lake Management Activities:

Important to Note: *When herbicides are applied along the shoreline to invasive plants (such as torpedo grass), overspray onto adjacent desirable vegetation may occur. In order to avoid damage to desired vegetation, manual (by hand) removal (by property owner) of the undesirable species from among the desirable species is advised. If the invasive plants are removed by this method, spraying the area can be eliminated, thereby offering greater protection to the desirable species. The physical removal of /dead/decaying aquatic plant material will reduce the volume of decomposing vegetation on the lake bottom (muck layer) and will increase the success of the efforts to limit the re-growth of the invasive plants.*

A restoration event was held October 22, 2011 where LMP coordinated with the community lake liaison members to target various problem areas that were outside of the identified activities established for MSBU assessment. These plants have many benefits aside from looking great. They will help filter pollution runoff before it enters into your lake, reduce shoreline erosion, and provide habitat for wildlife

The MSBU herbicide contractor continues to treat the exotic species in Mirror Lake. Lily pads were targeted in a treatment on July 30, 2011. Torpedo grass has been treated to the point that it is no longer the dominant species within the lake. The herbicide contractor continues to be instructed to reduce the lilies as permitted on our Florida Fish and Wildlife Commission (FWC) aquatic plant permit in waters with greater than four (4) feet depth only.

In the cove adjacent to the Barrington apartments, invasives have been successfully treated and the soft rush has expanded very well. Both Barrington and the MSBU contracted services have focused on containing the invasives within this area. The Barrington's' have conducted a cleanup on the upland side of the lake whereas the MSBU has treated within the shoreline/lake. Adding to this collaborative effort, LMP has provided community volunteers through the SERV Program and free aquatic plants. Combined with lake resident participation, this is an excellent demonstration of great stewardship between the various stakeholders working together on their lake!

Lake Management Recommendations

Lake Management Program recommendations for the upcoming fiscal year [FY 2012-2013] are:

- 1) Continued monitoring of hydrilla and grass carp activity,**
- 2) Continued aquatic herbicide maintenance for exotics such as torpedo grass hydrilla,**
- 3) Future grass carp stockings, if required,**
- 4) Shoreline re-vegetation with native emergent plants (by the lakefront community and potentially with volunteers),**
- 5) Establishing a Lake Association and having at least one annual meeting with topics relevant to Mirror Lake,**
- 6) Implement educational outreach programs i.e. Florida Yards and Neighborhoods (FYN) presentations, Lake Management Video mail-outs, newsletters, and reduction of residential pollution by using low fertilizer use; phosphorous free fertilizers; keeping a functional shoreline with beneficial native aquatic plants; keeping grass clippings out of your storm drains leading to the lake. All these activities aid in protecting your lake! Contact Gloria Eby (407) 665-2439 or Marie Lackey (407) 665-2424 for more information and assistance.**

LMP recommends/encourages homeowners to coordinate a resident-based volunteer event involving native plantings along the shoreline of Mirror Lake. The intention of such an event is to plant beneficial native aquatic plants to key areas in need along the bank. Residents should organize planting days creating a beneficial shoreline. It is especially important that as the aquatic invasive plants (such as torpedo grass) are being treated, native aquatic plants should be established within these areas. The presence of the recommended native plant species along the shoreline provides habitat for fish and wildlife, helps impede invasive exotics from re-establishing and reduces erosion of the shoreline. All of these best management practices are essential to providing the conditions that promote an environmentally stable habitat to be enjoyed by generations to come. The key to success is dependent on strong participation of the Mirror Lake community.

Cost of Aquatic Weed Control:

Funding: FY October 2011 – September 2012

1)	\$12,960	Assessment Revenue (per early payment discounts) + Interest
2)	<u>\$ 7,311</u>	Reserve and Contingency (beginning fund balance)
	<u>\$20,271</u>	Total Revenue

Expenditures were as follows:

1)	\$ 468	Additional Herbicide –Hydrilla – November treatment
2)	\$ 5,625	Contracted Services – 9 months (skip Jan., Feb, Sept.)
3)	\$ 1,815	Loan & Interest Payment (Final Payment)
4)	\$ 875	County Administrative Fee
5)	<u>\$11,488</u>	Contingency reserve (carried forward to next year if not required)
	<u>\$20,271</u>	Total Expenditures

Budget FY October 2012 – September 2013

Budgeted Revenue:

1)	\$13,000	Assessment Revenue (per early payment discounts)
2)	<u>\$11,488</u>	Reserve and Contingency (beginning fund balance)
	<u>\$24,488</u>	Total Revenue

Budgeted Expenditures:

1)	\$ 3,000	Additional Herbicide – spot treatments
2)	\$ 6,500	Budgeted hydrilla half lake treatment
3)	\$ 550	Additional Labor for application
4)	\$ 5,625	Contracted Services – 10 months (skip Jan. and Feb.)
5)	\$ 400	Budgeted Triploid Grass Carp Stocking
6)	\$ 875	County Administrative Fee
7)	<u>\$ 7,538</u>	Contingency reserve (carried forward to next year if not required)
	<u>\$24,488</u>	Total Expenditures

Note:

1. Any financial activity from prior years is available upon request.
2. Contingency reserve to be utilized in FY 2012-2013 for a half-lake submersed aquatic vegetation estimated at \$6,500. This is in addition to the monthly maintenance treatments.

MSBU Background

At the request of the community of Mirror Lake, the Mirror Lake Aquatic Weed Control MSBU was created by Ordinance 06-74 on October 24, 2006 to provide assessment funding for lake management and aquatic weed control for Mirror Lake. At that time, several essential activities were identified with the community liaison members representing Mirror Lake and County staff from both Lake Management [LM] Program and MSBU Program. This identified and prioritized several essential activities for the Mirror Lake Aquatic Weed Control MSBU, which are as follows:

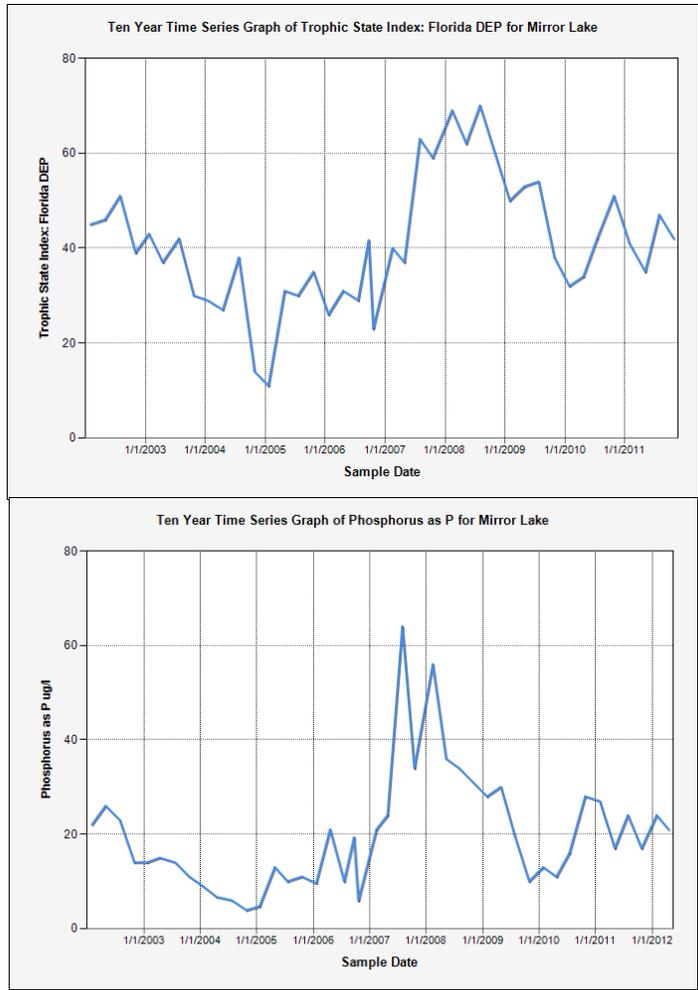
- 1) Treatment of hydrilla,
- 2) Aquatic vegetation maintenance for two 20ft corridor (as permitted by FDEP)- Herbicides,
- 3) Reduce biomass of lilies in depths greater than 4ft. (as permitted by FDEP)- Herbicides,
- 4) Continued torpedo grass removal- Herbicides/Volunteers, and
- 5) Expand native aquatic plant shoreline.

Mirror Lake 2012 Water Quality Report: How Does the TSI of My Lake Rank?

42 GOOD

The Trophic State Index (TSI) is a classification system designed to "rate" individual lakes, ponds and reservoirs based on the amount of biological productivity occurring in the water. Using the index, one can gain a quick idea about how productive a lake is by its assigned TSI number. A "Good" quality lake is one that meets all lake use criteria (swimmable, fishable and supports healthy habitat).

The 2 graphs below indicates nutrient levels (measured by TSI and/or Total Phosphorous [TP]) for your lake. A TSI score of 60 or above is considered impaired (or polluted) lake. For Mirror Lake, there was a significant loading of TP attributed to the Tropical Storm Faye event in 2008 that correlates to the increase in TP. Reduction of TP sources (personal pollution, run-off, landscaping practices, shoreline erosion) can help reduce phosphorous in your lake that is abundantly available, potentially creating algae blooms.



You can find this information and much more at:
<http://www.seminole.wateratlas.usf.edu/lake/waterquality.asp?wbodyid=7616&wbodyatlas=lake>

Lake Vegetation Index Bioassessment (LVI): How Does My Lake Rank? 54 HEALTHY

The Lake Vegetation Index is a rapid bioassessment tool created by the Florida Department of Environmental Protection (FDEP) to assess the biological condition of aquatic plant communities in Florida lakes. The recent LVI assessment for Mirror Lake scored a **54** which is a significant improvement from **26 (Category 3-Impaired)** since inception of our lake management efforts in 2008.

Aquatic life use category	LVI Range	Description
Category 1 “exceptional”	78–100	Nearly every macrophyte present is a species native to Florida, invasive taxa typically not found. About 30% of taxa present are identified as sensitive to disturbance and most taxa have C of C values >5.
Category 2 “healthy”	38–77	About 85% of macrophyte taxa are native to Florida; invasive taxa present. Sensitive taxa have declined to about 15% and C of C values average about 5.
Category 3 “impaired”	0–37	About 70% of macrophyte taxa are native to Florida. Invasive taxa may represent up to 1/3 of total taxa. Less than 10% of the taxa are sensitive and C of C values of most taxa are <4.

Mirror Lake Inspections FY 2011-2012

Summary of the July 17 and August 2, 2012 inspection/report: On July 17, 2012, Seminole County Lake Management Program (SCLMP) personnel, Thomas Calhoun, inspected Mirror Lake by foot due to low water conditions. This was a partial inspection and was rescheduled to access the lake via boat with hopes of higher water elevation towards the end of the month.

On August 2, 2012, SCLMP personnel, Thomas Calhoun and Stan McCreary, surveyed the aquatic plants of Mirror Lake by boat. Although the water elevation is coming up, it still remains extremely low in Mirror Lake, exposing several areas of the natural lake bottom. Many areas along the shoreline that are exposed are experiencing a lot of growth from invasives, such as, barnyard grass, torpedo grass, primrose willow, and dog fennel. These areas will be treated by the Seminole County herbicide contractor as the water elevation rises. It is recommended that these areas be mowed if possible. Burhead sedge and water lilies will continue to be treated upon next service date. Mirror Lake has a large and healthy amount of native submersed aquatic vegetation (SAV). This vegetation plays an important role in competing for space with hydrilla as well as providing habitat for wildlife and up taking nutrients within the system. The native SAVs found during this inspection included; lemon bacopa to a depth of 1 feet, coontail to a depth of 5 feet, musk grass to a depth of 5 feet, southern naiad to a depth of 5 feet, stonewort to a depth of 2 feet, bladderwort to a depth of 5 feet, baby's tears to a depth of 1 feet, and eelgrass to a depth of 3 feet. Hydrilla was found along the shoreline in shallow water but found very sparse and intermixed with the native SAV. Many large grass carp fish were seen in shallow water, possibly feeding on the hydrilla. We will keep monitoring the amount of hydrilla within the lake to see if any further action will be necessary. The secchi (water clarity) was 5.5 feet out of 6.5 feet total depth. Five grass carp were observed. Liaisons present at the annual MSBU meeting (held on July 25, 2012) have reported no otter sightings on the lake in the last 6-8 months

Summary of the June 7, 2012 inspection/reports: On June 7, 2012, Seminole County Lake Management Program (SCLMP) personnel, Gloria Eby and Thomas Calhoun, surveyed the aquatic plants of Mirror Lake. Due to low water conditions, Mirror Lake was inspected from the shore. Water elevations are extremely low in Mirror Lake exposing several areas of the lake bottom. Many areas along the shoreline that are now exposed are experiencing accelerated growth from invasive plants such as barnyard grass, torpedo grass, and dog fennel. These areas are unable to be treated by the County's MSBU funded herbicide contractor until the water elevation rises to allow airboat access to these plants. SCLMP recommends that these areas be mowed (if possible) during the drought phase. Once water is at adequate level for the airboat to access, any existing invasives will be treated. Hydrilla was found along the shoreline in two areas, but found very sparse and intermixed with the native SAV. The only large monoculture of hydrilla found during the inspection was around the dock at Barrington Apartments, but in a smaller amount than previous inspections. The low water elevation has helped eliminate the hydrilla inshore by exposing it in many places. We will keep monitoring the amount of hydrilla within the lake to see if any further action will be necessary. The only other SAV found during the inspection included eelgrass, bladderwort, and lemon bacopa. The secchi (water clarity) was not taken due to low water conditions and no grass carp were seen during the inspection.

Summary of the April 17, 2012 inspection/reports: On April 17, 2012, Seminole County Lake Management Program (SCLMP) personnel Thomas Calhoun, Stan McCreary, and Devin Whitney surveyed the aquatic plants of Mirror Lake. Due to low water conditions, Mirror Lake was inspected from the shore. Six species of submersed aquatic vegetation (SAV) were observed. SAV present included five natives (lemon bacopa, southern naiad, stonewort, bladderwort (*Utricularia foliosa*), and eelgrass) and one exotic species (hydrilla). Overall, the native SAV presence was very healthy and is expanding around the lake which is beneficial to the overall health of the lake. Hydrilla was found along the shoreline in all areas that was inspected but found very sparse and intermixed with the native SAV. The only large monoculture (single crop) of hydrilla found during the inspection was around the dock at Barrington Apartments. It is expected that when the water elevation increases, the present grass carp fish population will be able to start consuming this plant. We will keep monitoring the amount of hydrilla within the lake to see if any further action will be necessary (such as herbicide treatments). The MSBU herbicide contractor has reconvened treating the exotic species in Mirror Lake. Lily pads were targeted in the last treatment on April 17. Torpedo grass has been treated to the point that is no longer the dominant species within the lake. Native vegetation is returning from its winter state and is doing very well. It is still a great time to target and remove the dead torpedo grass around the lake due to the low water level. This would encourage the expansion of the planted native vegetation. The secchi (water clarity) was not taken due to low water conditions and no grass carp were observed during the inspection.

Summary of the March 20, 2012 inspection/reports: On March 20, 2012, Seminole County Lake Management Program (SCLMP) personnel Thomas Calhoun and Devin Whitney surveyed the aquatic plants of Mirror Lake. Due to low water conditions, Mirror Lake was inspected from the shore. Six species of submersed aquatic vegetation (SAV) were observed, 5 native and one exotic: lemon bacopa, southern naiad stonewort, bladderwort (*Utricularia foliosa*), and eelgrass. Overall, the native SAV was very healthy and is expanding around the lake. Hydrilla was found along the shoreline in all areas that were inspected. The hydrilla was found in monocultures (single crop) as well as intermixed with the native SAVs. This is an expansion of hydrilla since the previous inspection. It is expected that when the water elevation raises the present grass carp population will be able to start consuming this plant. We will keep monitoring the amount of hydrilla within the lake to see if any further action will be necessary. After a break for the months of January and February (as a cost savings effort), the Seminole County MSBU funded herbicide contractor has resumed treating the exotic species in Mirror Lake this month. Torpedo grass has been treated to the point that it is no longer the dominant species within the lake. Lily pads will be targeted in the upcoming treatments. Native vegetation is returning from its winter state and is doing very well. Now would be a great time to target and remove the dead torpedo grass around the lake due to low water level. This would encourage the expansion of the planted native vegetation. The secchi (water clarity) was not taken due to low water conditions and inaccessibility by boat.

Summary of the February 6, 2012 inspection/reports: On February 6, 2012 Seminole County Lake Management Program (SCLMP) personnel Thomas Calhoun and Dean Barber surveyed the aquatic plants of Mirror Lake. Nine different submersed aquatic vegetation (SAV) species were observed; 8 native and one exotic: lemon bacopa to a depth of 3 feet, musk grass to 3 feet, road grass to 3 feet, filamentous algae to 3 feet, southern naiad to 3 feet, stonewort to 4 feet,

bladderwort (*Utricularia foliosa*) to 6 feet, and eelgrass to 2 feet. Overall, the native SAV present was very healthy and is expanding around the lake. The invasive exotic hydrilla was found to a depth of 6 feet intermixed with the native vegetation. Hydrilla has not expanded much beyond and is found mostly adjacent to the shore (in shallow water) as a monoculture (single crop). When the water elevation rises, the present grass carp population is expected to be able to consume this plant given adequate depth. We will keep monitoring this monoculture and evaluating the need for future intervention with herbicides and/or grass carp fish. The Seminole County herbicide contractor has continued to treat invasive plants lake wide and also the lily pads in isolated areas that are creating a nuisance as permitted by FWC. This, coupled with some winter die back, has the shoreline and emergent vegetation looking very brown. This vegetation will come back with the return of spring. With the current low water elevation of the lake, now would be a great time to target and remove the dead torpedo grass. This would encourage the expansion of the planted native vegetation come spring time. The plantings from the October 22, 2011 restoration event at The Barrington Apartments are doing extremely well over this winter. We continue to encourage such native plantings along the shoreline. The secchi (water clarity) was 6.7 feet in a depth of 8.5 feet compared to 6.1 feet during the December survey. Water elevation was 57.29 feet above sea level compared to previous reading of 58.07 feet.

Summary of the December 13, 2011 inspection/reports: On December 13, 2011, Seminole County Lake Management Program (SCLMP) personnel Thomas Calhoun and student-intern Devin Whitney surveyed the aquatic plants in Mirror Lake. Nine submersed aquatic vegetation (SAV) were observed; 8 native and one exotic. Plants observed include: lemon bacopa to a depth of 3 feet, musk grass to 5 feet, road grass to 3 feet, filamentous algae to 3 feet, exotic hydrilla to 10 feet, southern naiad to 6 feet, stonewort to 6 feet, bladderwort (*Utricularia foliosa*) to 6 feet, and eelgrass to 4 feet. Overall, this is a very good variety of SAV for Mirror Lake. Hydrilla was only found in one area in the treated plots along the west central shoreline. Outside of the treatment areas, hydrilla has not expanded much near shore or offshore, but is present in many locations around the lake. We will continue to monitor hydrilla growth evaluating grass carp fish needs and future herbicide treatments. The native plants from the October 22 restoration event are expanding and in great shape. These plants include pickerelweed, duck potato, canna, and soft rush. With the continued maintenance from the Seminole County herbicide contractor, it is hoped that these native plants will expand and out-compete torpedo grass to become the dominant shoreline vegetation. In the cove adjacent to the Barrington apartments, invasives have been successfully treated and the soft rush has expanded very well. Both Barrington and the MSBU contracted services have focused on containing the invasives within this area. Barrington has conducted a cleanup on the upland side of the lake whereas the MSBU has treated within the shoreline/lake. Adding to this collaborative effort, LMP has provided community volunteers through the SERV Program and free aquatic plants. Combined with lake resident participation, this is an excellent demonstration of great stewardship between the various stakeholders working together on their lake! Water lilies have been targeted lake wide in the last herbicide treatment and are showing signs of impact from the recent treatment. The secchi (water clarity) was 6.1 feet in a depth of 13.5 feet compared to 7.8 feet on the October survey. Water elevation was 58.07 feet above sea level compared to previous reading of 59.44 feet.

Summary of the October 11, 2011 inspection/reports: On October 11, 2011, Seminole County Lake Management Program (SCLMP) personnel Gloria Eby and Thomas Calhoun surveyed the aquatic plants of Mirror Lake. Nine submersed aquatic vegetation (SAV) were observed of which 8 were native and 1 was exotic. These plants included: lemon bacopa to a depth of 3 feet, musk grass to 5 feet, road grass to 5 feet, filamentous algae to 7 feet, the invasive exotic hydrilla to 7 feet, southern naiad to 7 feet, stonewort to 3 feet, bladderwort (*Utricularia inflata*) to 7 feet, and eelgrass to 4.5 feet. All SAV plants were observed at greater depths than in the previous inspection. This is likely due to the rise in lake elevation from recent storm events. Hydrilla was found stressed in the treated plots along HOA access lot on south lobe. Outside of the treatment areas hydrilla continues to expand near shore and offshore. A new treatment plot will be scheduled along the west central portion of the lake. Eelgrass population continues to expand, being observed at new sites, however still in relatively shallow water (4.5 feet or less). Overall the emergent native aquatic plants are doing well throughout the lake. Torpedo grass, continues to be the dominant emergent aquatic plant, although, it has been treated throughout the lake. Water lilies have been expanding around the lake and will be targeted in next herbicide treatment with the recent rise in elevation. The secchi reading (measurement for water clarity) was 7.8 feet in a depth of 17.1 feet compared to 5.3 feet on the August survey. Water elevation was 59.44 feet above sea level compared to previous reading of 59.08 feet.