

Award: SUNY RF of Stony Brook University Peconic Estuary Partnership– GE1523

2024 Alewife Monitoring on the Peconic River System: Grangebél Park and Woodhull Dam

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This annual report contains information pertaining to the 2024 Alewife monitoring efforts and results of two sites on the Peconic River: Grangebél Park and Woodhull Dam. These two sites vary in methods and will be reported separately.

Grangebél Park Alewife Monitoring

The Grangebél Park Site represents the first obstruction Alewife encounter during their spawning migration in the Peconic River. A nature-like or rock ramp fishway was installed in 2010 and is the only route Alewife can use to reach freshwater suitable for spawning. This location serves as an excellent site for estimating the total number of Alewife that migrate into the Peconic River each year. The goals and objectives of this monitoring site are as follows:

Goal: To estimate the Peconic River Alewife Population

Objectives:

- 1) To maintain the video monitoring equipment installed at Grangebél Park during the spring migration.
 - 2) To analyze video data collected at Grangebél Site for daily estimates of Alewife passage.
- a) Accomplished Goals and Objectives
- 1) The monitoring equipment (camera, computer, job box, and wooden frame) was installed March 8th 2024 and removed May 24th 2024. Interns cleaned the equipment and collected/replaced SD memory cards at least 4 times per week for the months of March and April.
 - 2) Estimates for Alewife population size was calculated using Woodhull visual counts and detection percent as well as two mark-recapture events.
- b) Reasons why the established goals were not met, if appropriate.

Video analysis efforts were focused solely on Woodhull for the 2024 season. To calculate total passage at Grangebél, full season video capture and RFID antenna detections are needed to adjust for repeat passage within the season. Analysis of Grangebél videos were not completed for several reasons.

1) The entire run was not captured; A large school (visual estimates were roughly 10,000-20,000) of Alewife arrived at Woodhull on March 1st, a full week before the Grangebél camera and RFID antennas were installed. Based on the population measured at Woodhull, this could represent between 15% and 50% of the entire run.

2) Shortly after installation in late March and early April, there was a massive flooding event that spanned several weeks during the peak of the run which created large channels on either side of the camera for Alewife to bypass. During this flooding event, the Exit RFID antenna was fully submerged and the downstream antenna was damaged and inoperable (Figure 1,2).

Without full camera coverage and RFID detections, an accurate population estimate at this site is not able to be calculated.

- c) Additional pertinent information including problems encountered, future suggestions etc.

Equipment Needs for future years: Temperature and water level loggers may provide useful information on the drivers of Alewife run. Several brushes and rakes to clean the camera are in

need of replacing. Two 2 TB External hard drives will also be needed to store the videos from both locations. Waders will also need to be purchased for next years interns.

Camera Relocation Suggestion: Severe flooding occurred for the second third year in a row. The camera box needs be deployed upstream next year, away from eroding banks and as close to the exit as possible to avoid complete submersion at low tide (Figure 1, 2).

Camera Replacement Suggestion: The equipment used at Grangebél is outdated and has had many electrical issues. Wires are held together with electrical tape and putty and are not reliable to hold the connection. The computer is no longer compatible with current SD cards, requiring more trips and effort to replace cards that can only store 2 days of video. A replacement similar to the equipment purchased for Woodhull Dam would be appropriate and ideally would include Salmonsoft- a motion detection software that records video segments when fish appear. This would substantially reduce the amount of effort watching and analyzing video segments and potentially allow us to eliminate subsampling – which would greatly increase the population estimate accuracy. This may also reduce labor needed to watch videos.

Public Outreach: There is great interest from the public when the interns are performing maintenance on the camera. Watching the live camera is very intriguing to citizens. Having an outward facing live camera at the site (rather than keeping it in the job box), with an informative plaque could be a useful outreach tool. At the very least, a plaque explaining the purpose of the fishway would be effective.

Woodhull Dam Alewife Monitoring

The Woodhull Dam represents the second obstruction Alewife encounter during their spawning migration in the Peconic River in the Little River tributary. A pool and weir fishway with an additional culvert at the top of the fishway was installed in 2022. 2023 was the first year that camera monitoring was deployed, however broke down midway through the season. In 2024, The camera was replaced and installed at a new location, inside the viewing pool directly at the fishway exit. Camera monitoring was used to quantify the number of Alewives are successfully using the fishway and entering the newly restored habitat of Little River and Wildwood lake.

Goal: To estimate the number of Alewife using the Byron Young Fish Passage at Woodhull Dam

Objectives:

- 1) To maintain the video monitoring equipment installed at Woodhull Dam during the spring migration.
- 2) To analyze video data collected at Woodhull Dam for daily estimates of Alewife passage.

d) Accomplished Goals and Objectives

Equipment Maintenance and installation: The new camera was installed Feb 27th 2024 before Alewife were seen arriving in the Peconic River. Videos were analyzed through May 6th. The new placement of the camera is successful at capturing all Alewife successfully passing the fishway (Figure 3).

Video Analysis Method: Salmonsoft was used to monitor the run and pre-screened the videos which had any motion detected. The entire video data collected was analyzed, thus provides a total count.

Alewife Woodhull Passage: Visual estimates of Alewife in the Woodhull pool varied between 10,000 and 40,000 in early March. A total of 983 Alewife were detected going through the fishway and passing through the camera between 3/14/24 and 5/1/24 (Figure 4). The fishway can successfully pass Alewife. Since the 2023 passage total could not be obtained, this 2024 value is the first quantification of passage efficiency and upstream usage by Alewife.

Population Estimate

Several hundred Alewife were PIT tagged and released below Woodhull Dam in 2023 and 2024. Passage rates can be obtained next year when tagged fish return to the system, contingent on the PIT tag antenna array being deployed and maintained by Dr. Peter Daniel (Hofstra University). The PIT tag passage efficiency (# tagged fish detected at upstream antenna / # tagged fish detected at downstream antenna) was 2.5%. Applying this proportion to the total camera count results in approximately 40,000 Alewife in the Peconic River (Figure 5.). A Lincoln Peterson model (equation below)

$$N = \frac{\text{marked} \times \text{total captured}}{\text{recaptured}}$$

was used to estimate the size of the Woodhull pool on the day of tagging and two weeks after tagging. Visually, the day of tagging appeared to coincide with the peak of the Alewife run. Mark-recapture estimates support the total population size estimated using passage efficiency (Table 1.). Note that we do not have to adjust the visual counts obtained by the Woodhull camera for repeat passage within season due to low passage efficiency and no evidence that this is occurring.

Table 1 Mark Recapture Results for Alewife In Woodhull Pool

<i>Date</i>	<i>Fish Tagged</i>	<i>Captured</i>	<i>Recaptured</i>	<i>Population Estimate</i>
<i>3/29/24</i>	<i>386</i>	<i>253</i>	<i>3</i>	<i>32,553</i>
<i>4/12/24</i>	<i>62</i>	<i>241</i>	<i>1</i>	<i>14,942</i>

e) Reasons why the established goals were not met, if appropriate.

All goals were met.

f) Additional pertinent information including problems encountered, future suggestions etc.

Poor Alewife Passage Rate: Passage efficiency was less than 5% for tagged Alewife. Attraction efficiency was higher and does not appear to be a limiting factor to passage. Entrance to fishway was consistently saturated with fish, however passage through the 2nd upstream weir appeared to be minimal. Examining passage through each weir will be helpful in determining where the major obstacle in passage is located.

Glass Eel Passage: A net was place on the upstream exit of the eelpass from Feb 27th 2024 through May 25th 2024. Zero glass eels and 5 elvers were captured. Substantial modifications to the fishway including opening up the entrance, repairing the water pump and drilling holes into the eelpass to allow light are necessary to improve passage.

Additional Fish Passage: Bluegills, Black Crappies, Trout, and Bass were seen successfully passing through the fishway.

Juvenile Alewife: Juvenile Alewife were spotted in the viewing pool on October 25th 2024; evidence that production occurred above the Woodhull fishway.

Internship Participants *Internships:* Four internships with stipends were awarded to Suffolk County Community College students, Kyler Vander Putten, Isabelle Morrison, Ian Trendel, and Carlin Byrne and one unpaid internship was offered to SBU student Grace Nelson. All students equally participated in field maintenance, each visiting these sites at least 3 times per week, and analyzing ~14 days of Woodhull footage. Site visits needed to occur at least 4 times per week to manage camera fouling at Grangebel and Woodhull. Time from the video analysis was reallocated to field work. The occurrence of Alewife also was several weeks longer than the last three years, resulting in more field work and video analysis. Labor requirements or number of interns should be increased next year and may require additional funds.



Figure 1. Image of Camera box during high water level, showing passage ability around weirs. Note the eroding banks on either side of the weir.



Figure 2. Upstream Exit in Grangebel Fishway during flooding event; RFID antenna completely submerged.



Figure 3. Viewing pool at Woodhull. Camera placed at fishway exit with reflective board on opposite side. Fyke Net collecting eels below eelpass.

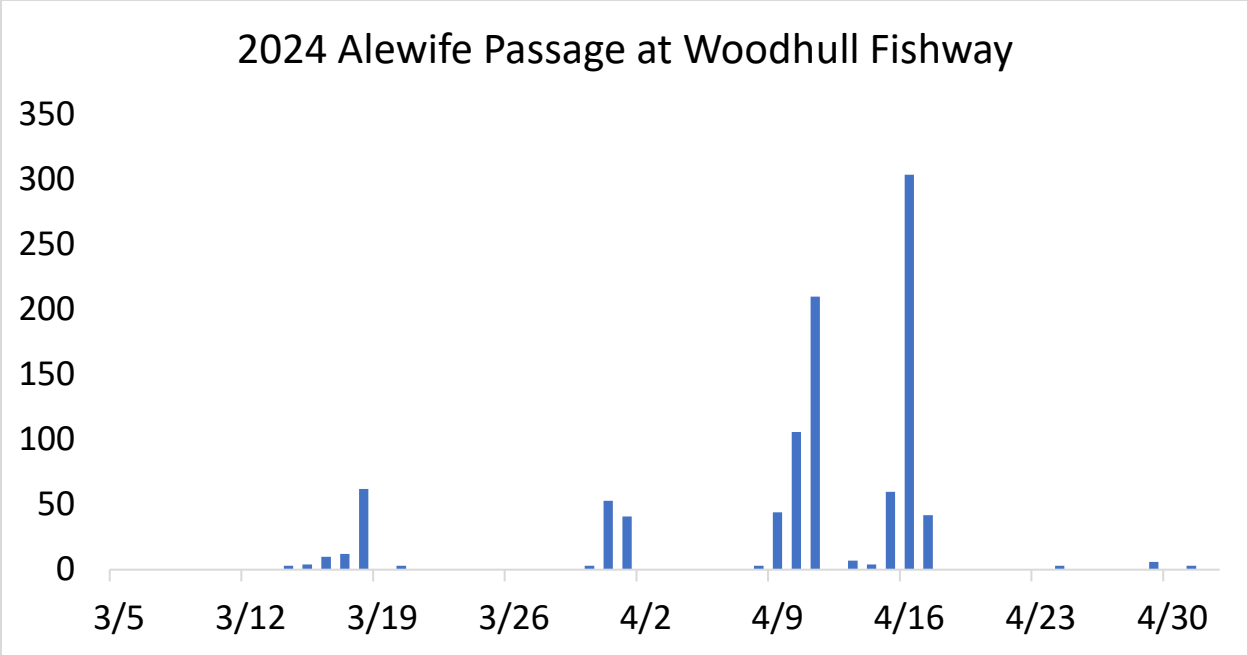


Figure 4. Daily Alewife Counts at Woodhull Fishway

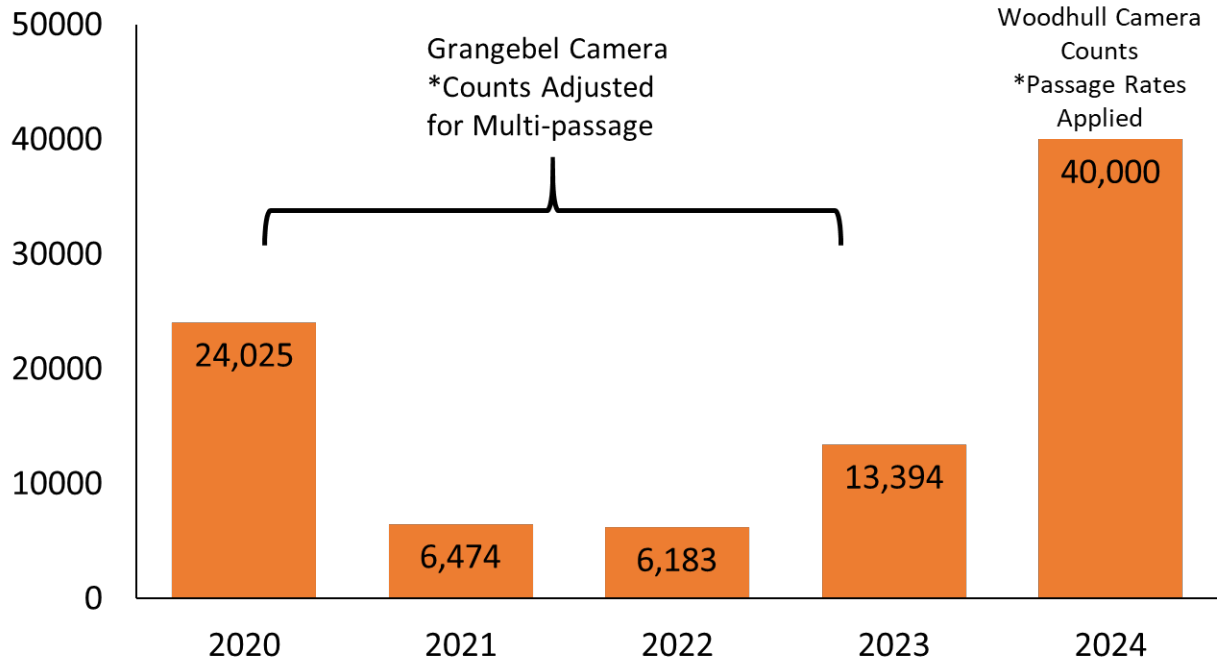


Figure 5. Alewife Population Estimates for Peconic River, 2020-2023 were obtained from visual counts at Grangebel Park. Multipassage rate applied to all years was 67%, decreasing all visual counts by 67%. 2024 was obtained from Woodhull only.