




# **MYSTIC RIVER HERRING MONITORING**

IN-PERSON vs VIDEO MONITORING: COMPARING PROCESSES AND RESULTS

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March 12, 2025

A map of the Mystic River watershed, showing a network of streams, rivers, and lakes in shades of teal and light blue. The land area is white. The map shows the watershed's extent from inland areas down to the coast.

**The Mystic River watershed is a network of streams, rivers, and lakes, all draining into the Mystic River.**

**76**  
SQUARE MILES

**44**  
LAKES & PONDS

**21**  
COMMUNITIES

**600,000**  
PEOPLE

LEARN MORE  
[MYSTICRIVER.ORG](https://MYSTICRIVER.ORG)

# INTERIM SOLUTION

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## BUCKET BRIGADE



Photo credit: David Mussina

# PERMANENT SOLUTION

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Fish ladder at  
Upper Mystic  
Lake

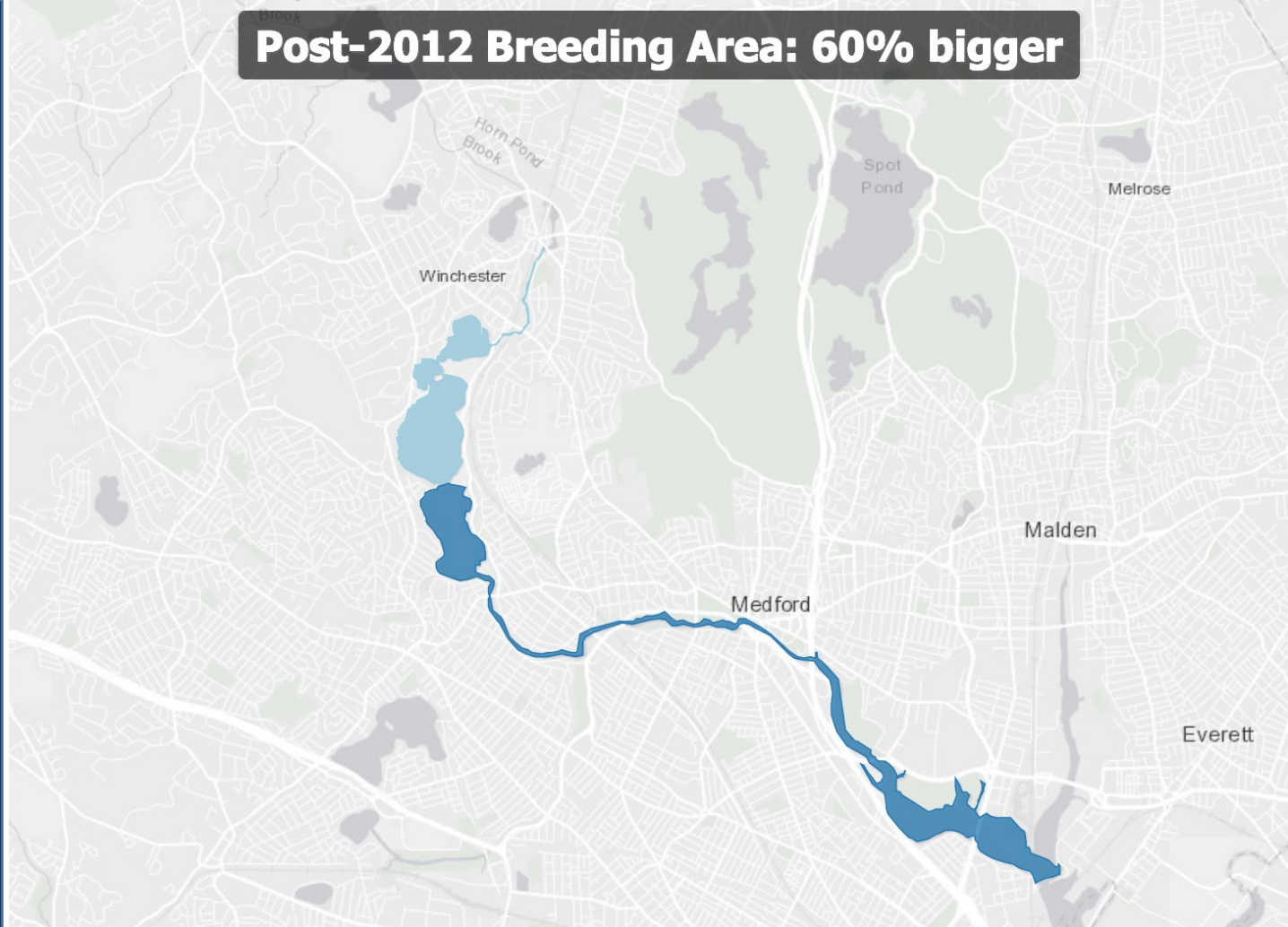


Photo credit: David Mussina

# AFTER THE FISH LADDER

Expanded  
breeding  
habitat

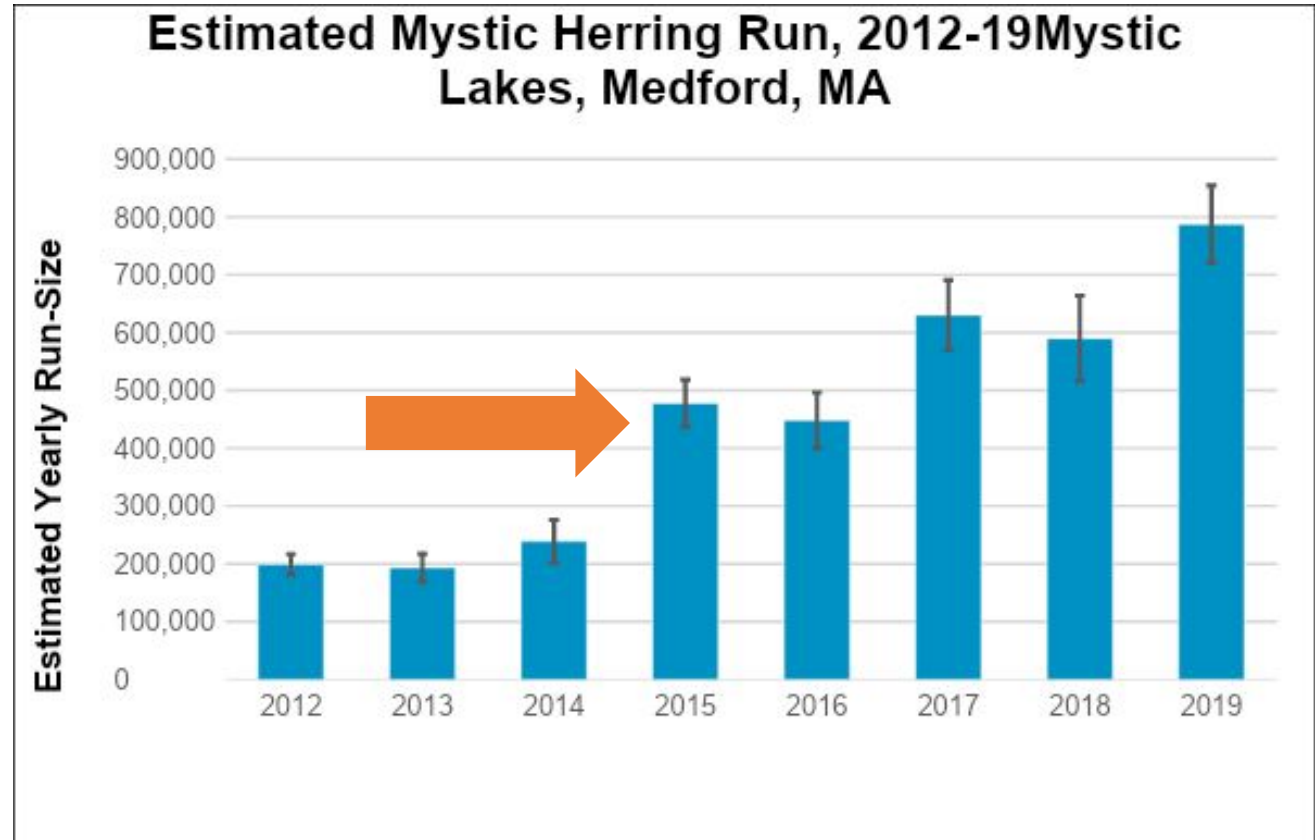
**Post-2012 Breeding Area: 60% bigger**



# RESULT

Population  
more than  
**doubled**

Fish return at  
age 3-4

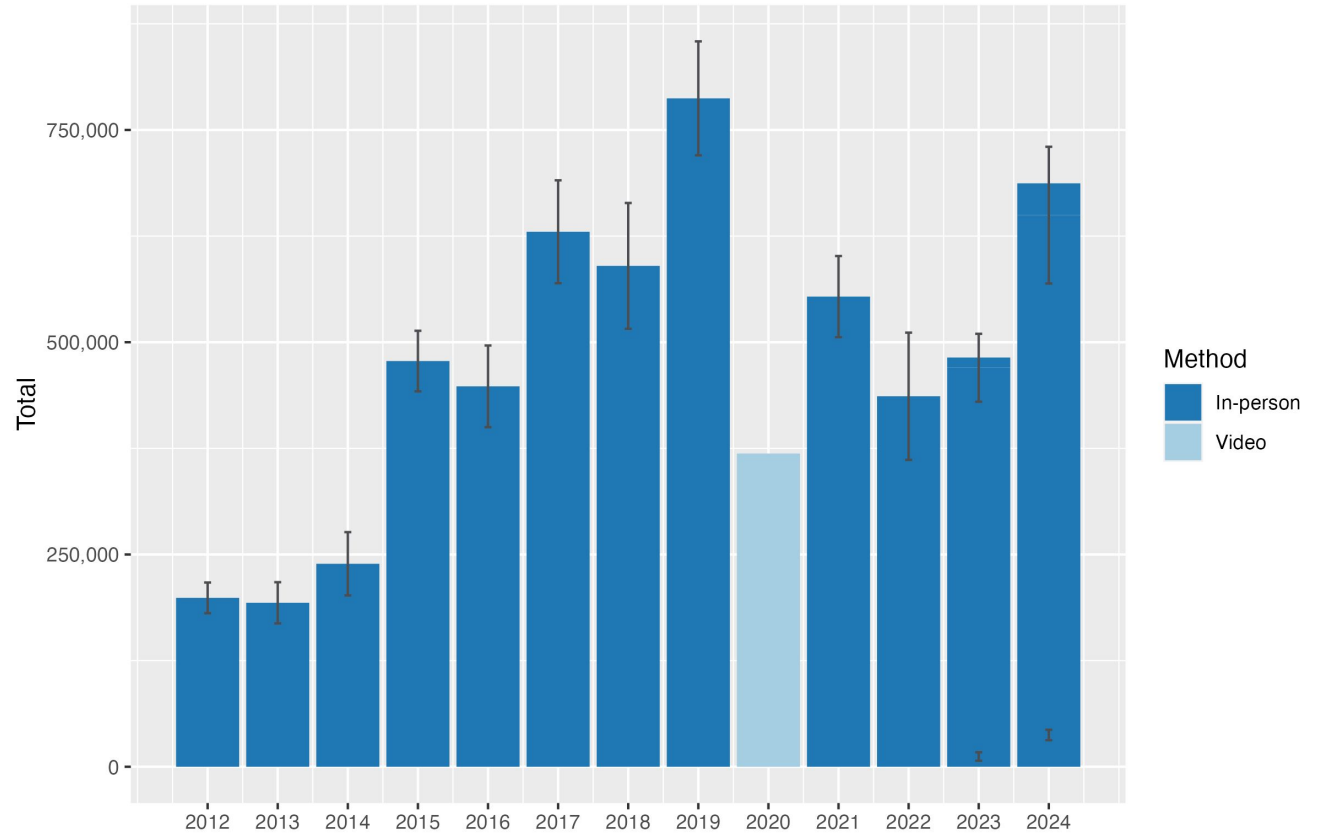


# 2024

## Largest herring run in MA

### Mystic River Herring Run, 2012-2024

Estimated totals passing through Mystic Lakes Dam, from volunteer counting data



Data source: MassDMF, MyRWA

# Volunteer Counts

Monitors conduct ten minute observations



Data collected, data quality control by MyRWA



Input data into a statistical model to estimate total run



Photo credit: David Mussina

# Mystic Lakes 2025 Schedule

# WHAT TO EXPECT

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Count fish going  
up the fish ladder



Example video:

[https://www.dropbox.com/s/lpregsi5zonl6uf/Herring\\_20210504.m  
p4?dl=0](https://www.dropbox.com/s/lpregsi5zonl6uf/Herring_20210504.mp4?dl=0)



# DATA SHEET



## Mystic Lakes Herring count

Electronic form for entering visual counts at Mystic Lakes, 2024

daria.clark@mysticriver.org [Switch account](#)

 Not shared  Draft saved


\* Indicates required question

Day of the Week (helps us track down date errors) \*

Choose ▾

Date \*

Date

04/07/2024 

Time count started \*

Time

10 : 25 AM ▾

Time count ended \*

Time

10 : 35 AM ▾

How many fish did you count going up fish ladder? \*

12 \_\_\_\_\_

Example QR Code



STEP 4: ENTER  
DATA



Mystic Lakes Herring count 2024 (Responses) ☆ ↗ ☁

File Edit View Insert Format Data Tools Extensions Help



Share

🔍 🖨️ 📏 100% 🔍 View only

A1 ⌵ ⌵ Timestamp

⚡ Summarize this

	A	B	C	D	E	F	G	H	I
1	Timestamp	Day of the Week (helps u	Date	Time count started	Time count ended	How many fish did you c	Weather	Comments? (optional) (fl	Last name
2	4/17/2024 7:23:31	Wednesday	4/17/2024	7:10:00 AM	7:20:00 AM	0	Sunny/clear		Settlemyre
3	4/17/2024 8:40:37	Wednesday	4/17/2024	8:25:00 AM	8:35:00 AM	0	Sunny/clear	Clear and calm. Air temp	Denham
4	4/17/2024 9:09:06	Wednesday	4/17/2024	8:55:00 AM	9:05:00 AM	0	Sunny/clear	Flow and visibility excelle	SISSON
5	4/17/2024 11:04:41	Wednesday	4/17/2024	10:46:00 AM	10:56:00 AM	0	1-25% cloud cover/mostl	Everything looks great, c	Grossi
6	4/17/2024 12:37:39	Wednesday	4/17/2024	11:37:00 AM	11:47:00 AM	0	1-25% cloud cover/mostl	The tree swallows have a	Fager
7	4/17/2024 14:03:51	Wednesday	4/17/2024	1:19:00 PM	1:29:00 PM	0	Sunny/clear		Piantedosi
8	4/17/2024 15:04:01	Wednesday	4/17/2024	2:50:00 PM	3:00:00 PM	0	1-25% cloud cover/mostl	Tons of cormorants at the	Jones
9	4/17/2024 16:42:19	Wednesday	4/17/2024	4:05:00 PM	4:15:00 PM	0	26-50% cloud cover/partl	Felt good on my first time	Braman
10	4/17/2024 17:45:50	Wednesday	4/17/2024	5:32:00 PM	5:42:00 PM	0	26-50% cloud cover/partl	Slight breeze	O'Boyle
11	4/17/2024 20:20:26	Wednesday	4/17/2024	12:15:00 PM	12:25:00 PM	0	1-25% cloud cover/mostl	Great to be back waiting	Cohen
12	4/18/2024 8:03:05	Thursday	4/18/2024	8:00:00 AM	8:10:00 AM	0	76-100% clouds		Sternfeld
13	4/18/2024 9:41:43	Thursday	4/18/2024	9:26:00 AM	9:36:00 AM	0	76-100% clouds		Alexander
14	4/18/2024 11:58:44	Thursday	4/18/2024	10:46:00 AM	10:56:00 AM	0	76-100% clouds	Strong current down the	Nowlan
15	4/18/2024 12:25:32	Thursday	4/18/2024	12:05:00 PM	12:15:00 PM	0	76-100% clouds	lots of cormorants at the	Yanco
16	4/18/2024 14:41:35	Thursday	4/18/2024	1:15:00 PM	1:25:00 PM	0	Drizzle/light rain	There was a school grou	Muckenhoupt
17	4/18/2024 15:57:01	Thursday	4/18/2024	3:15:00 PM	3:25:00 PM	0	Drizzle/light rain		Mcaree
18	4/18/2024 16:30:33	Thursday	4/18/2024	11:00:00 AM	11:10:00 AM	0	76-100% clouds		Galef
19	4/18/2024 16:50:34	Thursday	4/18/2024	4:37:00 PM	4:47:00 PM	0	Rain/moderate-heavy		Grunder
20	4/18/2024 18:41:21	Thursday	4/18/2024	6:25:00 PM	6:35:00 PM	0	Drizzle/light rain		McWhinney
21	4/19/2024 8:19:45	Friday	4/19/2024	7:50:00 AM	8:00:00 AM	0	76-100% clouds		Sharpe
22	4/19/2024 8:21:00	Friday	4/19/2024	8:07:00 AM	8:17:00 AM	0	76-100% clouds		Sharpe
23	4/19/2024 9:15:19	Friday	4/19/2024	9:03:00 AM	9:13:00 AM	0	51-75% clouds/mostly cl	Strong flow	Lauren Levine
24	4/19/2024 11:36:48	Friday	4/19/2024	11:19:00 AM	11:29:00 AM	0	26-50% cloud cover/partly cloudy		Donnelly
25	4/19/2024 13:21:26	Friday	4/19/2024	1:08:00 PM	1:18:00 PM	0	26-50% cloud cover/partly cloudy		Bremer

# Video Project Partners



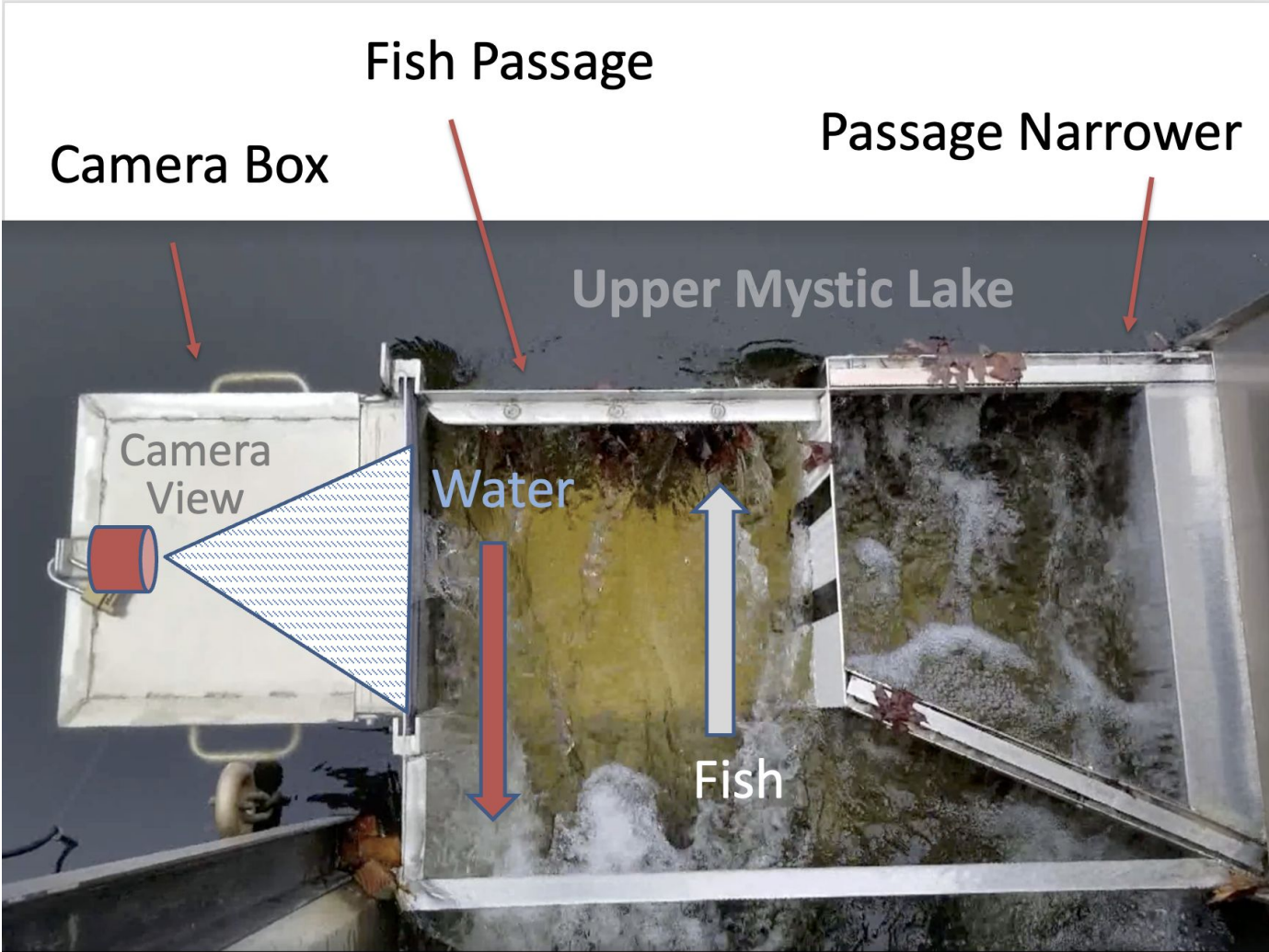
Medford • East Boston • Melrose • Somerville • Winchester

Public Schools

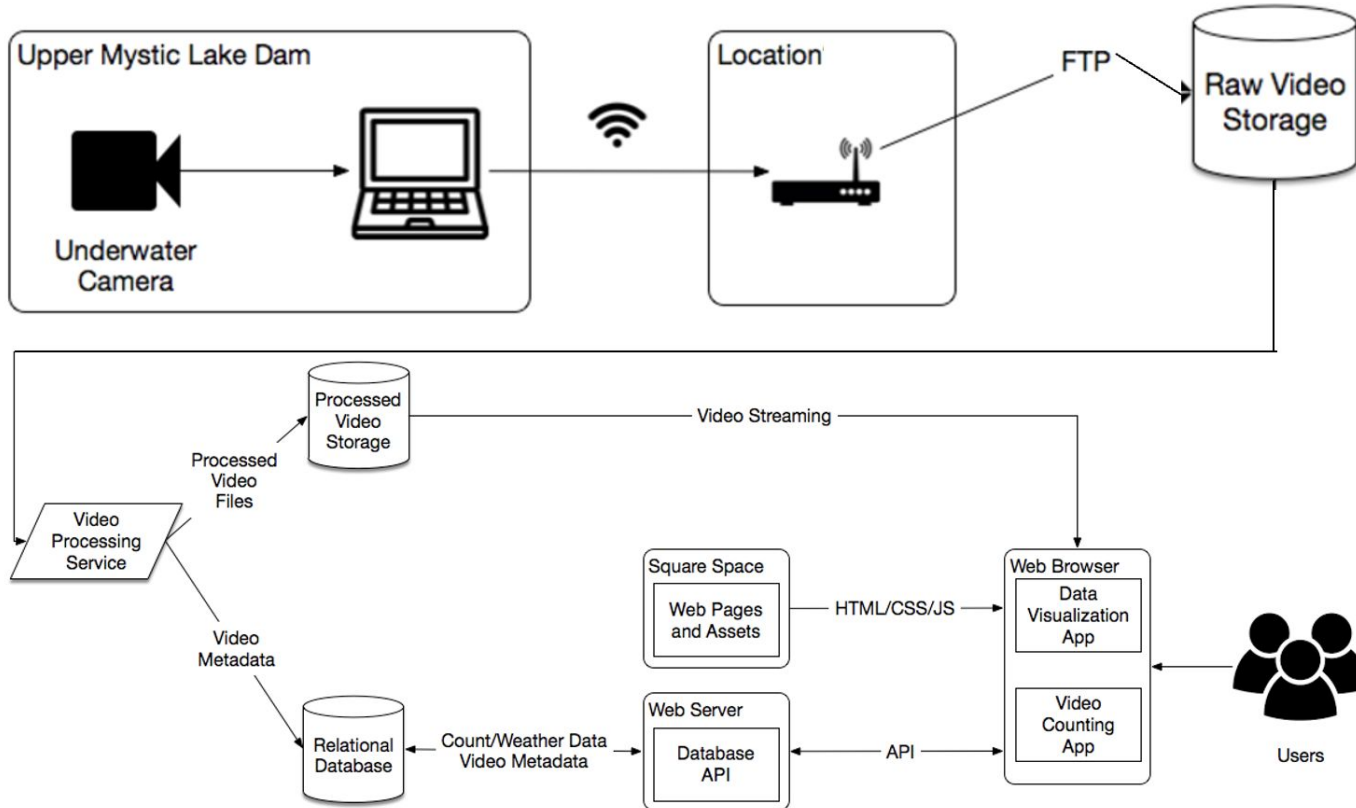
The Boston  
Foundation tBf



**Drane Family  
Fund**



# System Architecture



## WEBSITE

[mysticherring.org](https://mysticherring.org)

## Love Nature? Count Fish.

Help us track [river herring](#) populations in the Mystic River watershed, and be part of an [environmental success story](#). Watch a video and record what you see. Scroll down for the latest data. Have questions about the online counting, [check out the FAQs here](#).

Read [instructions](#) for more detail.

START COUNTING!

CURRENT DATA

INSTRUCTIONS

LEADERBOARD

LOGIN

SIGN UP

2024 Estimated Total Run (so far): 331,011 +/- 3,724 ?

Video Recorded: 5/8/2024, 12:13:45 PM

FPS: 10.00 5/8/2024 12:14:00 PM



Website

MysticHerring.org

**Mystic River**  
WATERSHED ASSOCIATION

FPS: 9.93 5/26/2018 10:56:13 AM

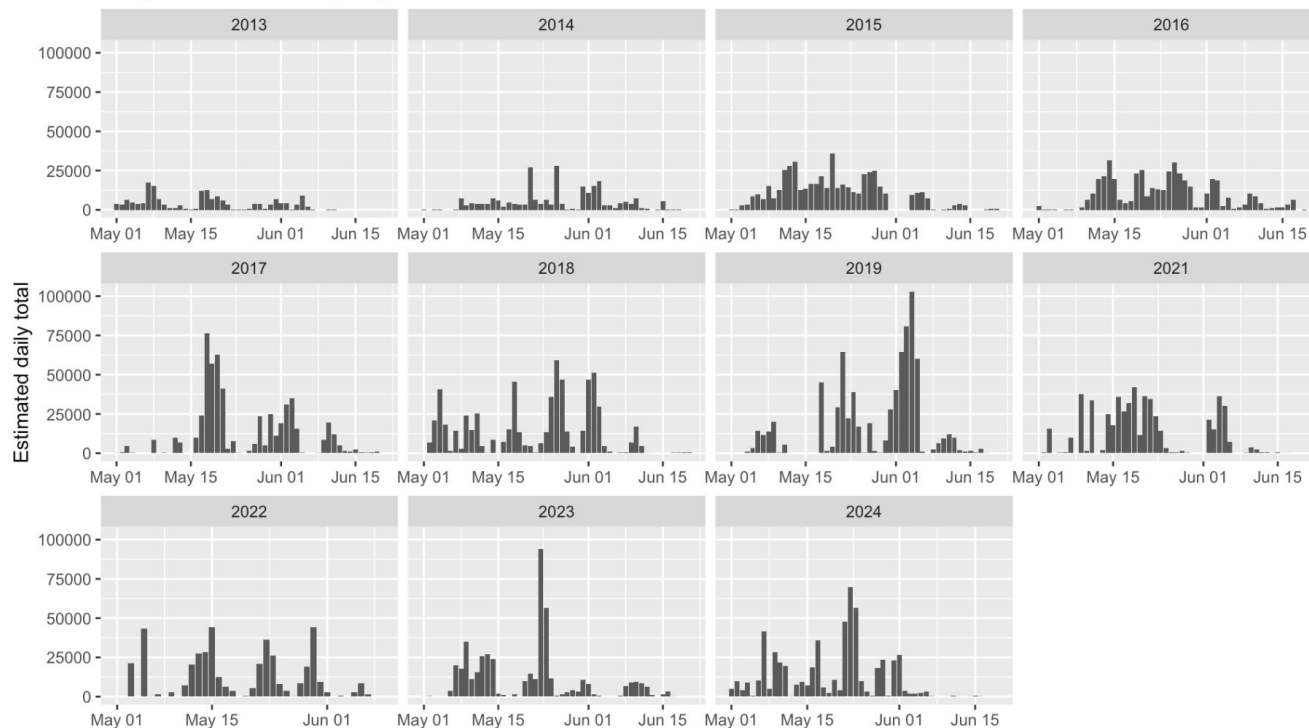


# VISUAL COUNT ALL YEARS

Visual Count  
estimates,  
2013-2024, as  
estimated by  
DMF based on  
volunteer data

## Daily estimates, all years, Visual Count

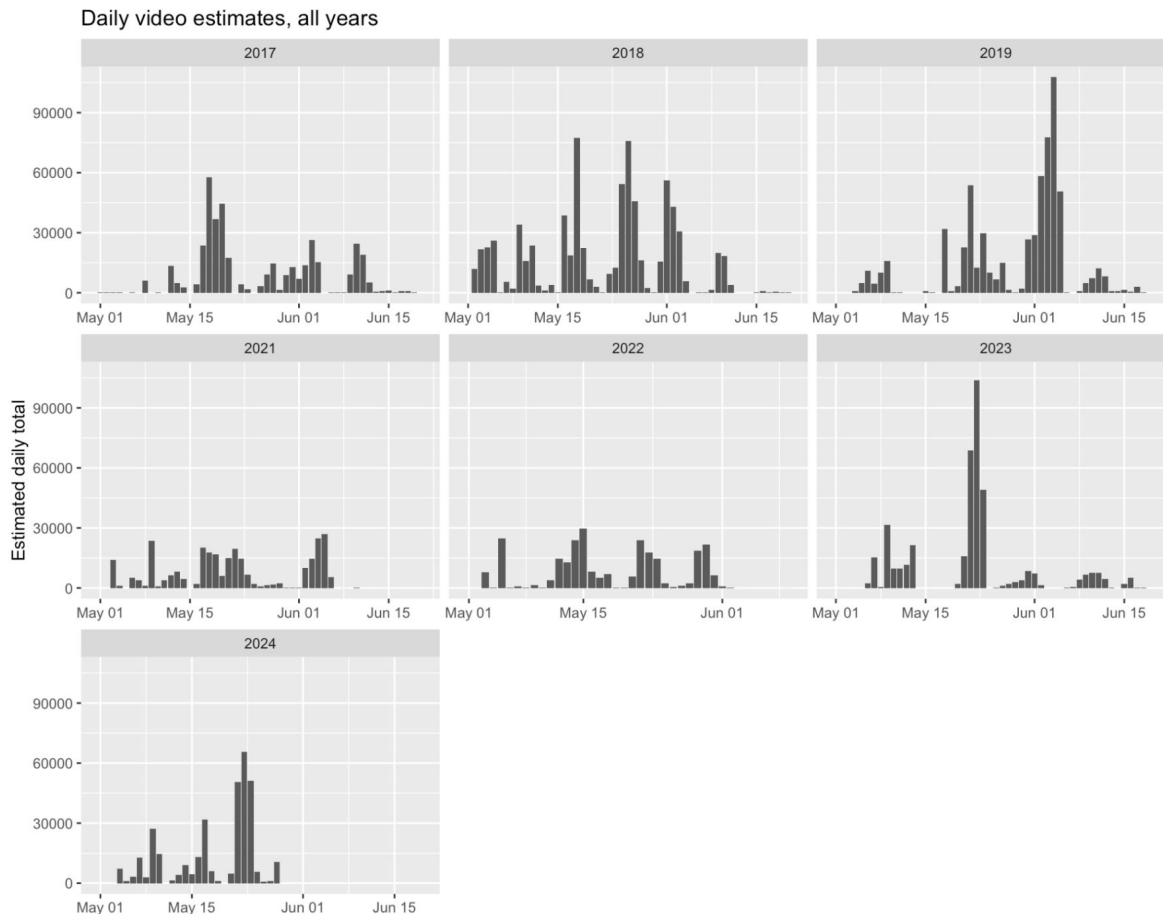
Daily visual estimates, all years



# VIDEO COUNT ALL YEARS

Video system  
daily estimates,  
2017-2024, using  
Jeff Walker's  
statistical model,  
and data from  
crowd-sourced  
volunteers

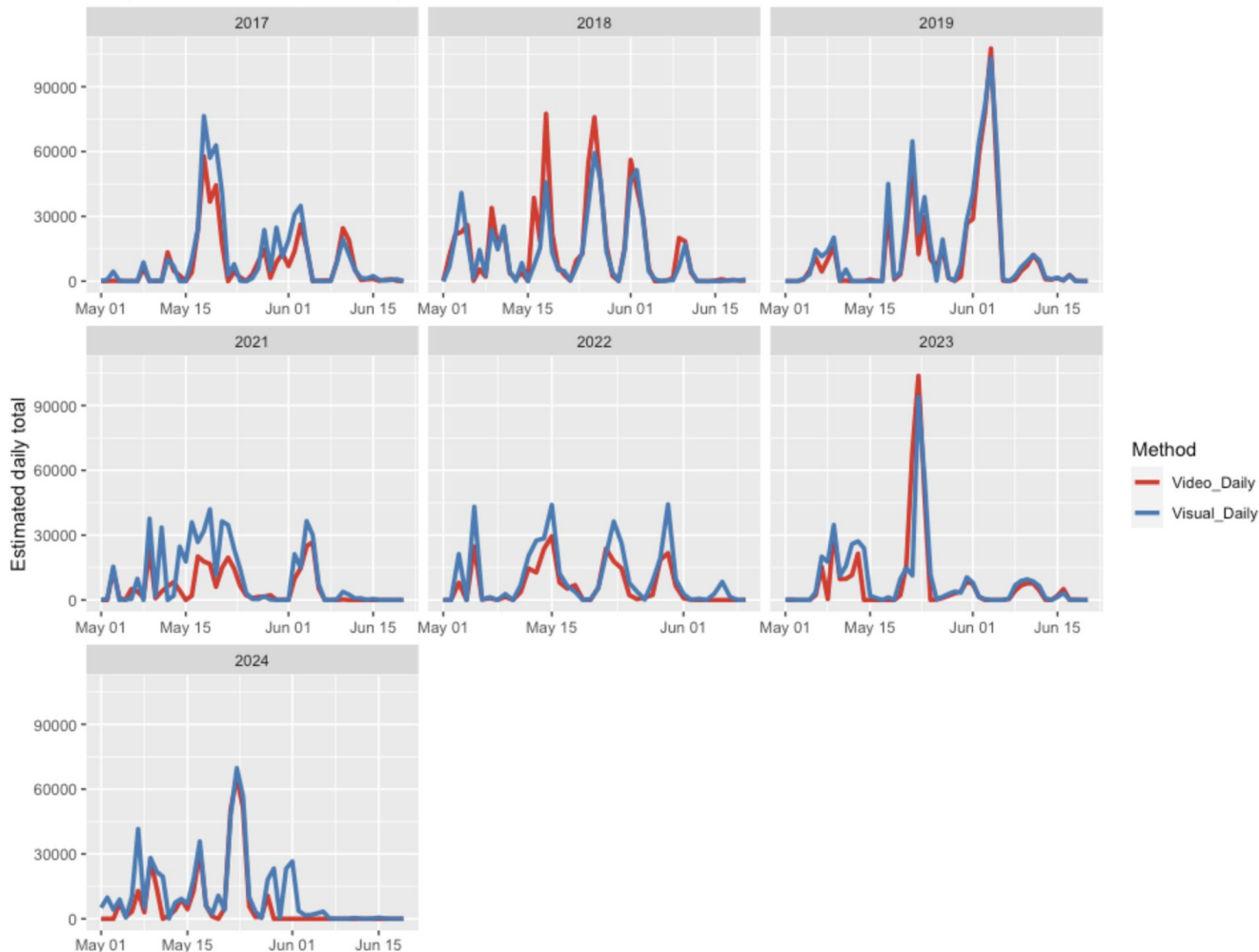
## Daily estimates, all years, Video Count



# COMPARING RESULTS

Video system  
estimates vs.  
Visual Count  
estimates,  
2017-2024

Daily estimates compared, all years

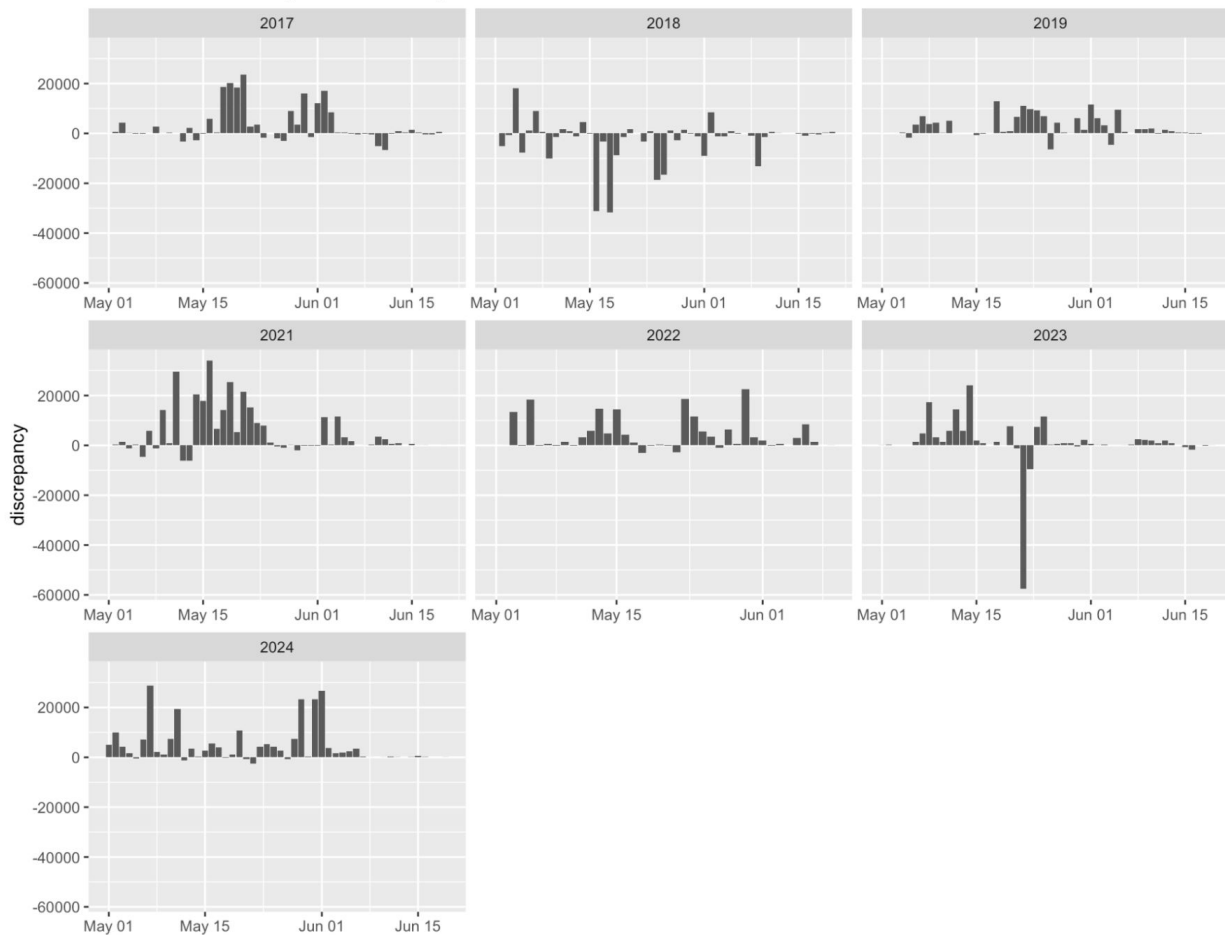


# COMPARING RESULTS

Discrepancies  
between Visual  
Count estimates  
and Video  
estimates,  
2017-2024

## Discrepancy between Video and Visual estimates

Visual vs Video daily estimates all years



## COMPARING RESULTS

Video system  
estimates vs.  
Visual Count  
estimates,  
2017-2023,  
May-Jun

Year	Visual DMF	Video	Difference	Percent_ difference
2017	630098	410667	219431	35%
2018	589924	756798	-166874	-28%
2019	787222	635015	152207	19%
2021	466545	283131	183414	39%
2022	436387	265124	171263	39%
2023	469922	408220	61702	13%

## LESSONS LEARNED

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Video system  
estimates vs.  
Visual Count  
estimates

- **Video system captures a lot, especially large scale patterns**
- **But water clarity and reliability can limit the video system's ability to capture**
- **The Visual Count with DMF is still our Gold Standard.**
- **Both are great outreach and education opportunities.**

## VIDEO INSIGHTS

Nighttime data  
from Brandeis  
data sprint, data  
from Mystic Lakes  
Dam, 2018

# Comparison of Night and Day Run Sizes

