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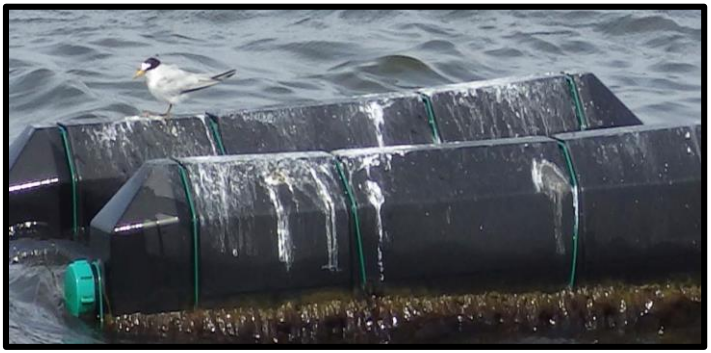
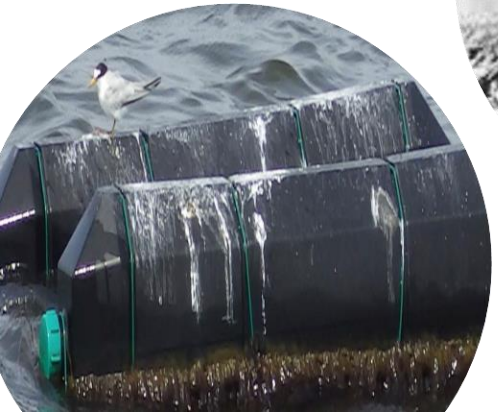


Bird Congregations on Floating Aquaculture Gear

Public Health Issues in New York State

Debra Barnes
Chief, Bureau of Shellfisheries
Northeast Shellfish Sanitation Association Meeting
Plymouth, MA
April 9-10, 2019

"The Birds" and Aquaculture



Why is this a problem?

Potential Impacts to Water Quality and Shellfish

What can be done to Mitigate?

Compliance and Effectiveness of Mitigation Measures

Permitting Requirements for Bird Mitigation Plans

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Floating Aquaculture Gear – Why is this a problem?

- Provide a Roosting Site for Birds; cormorants, gulls, terns
- Become a Feeding & Defecating Site
- Become a Bird Sanctuary
- Potential to contaminate the growing area and shellfish; needs to be considered as potential pollution source in sanitary surveys

Potential Impacts to Water Quality and Shellfish

Can be Scary

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2015 Shellfish Meat and Seawater Results
3 Oyster Culture Sites, Great South Bay

Date	Site	SST (°C)	Oyster FC MPN/100g	Seawater FC MPN/100mL
8/24/15	#1	26.6	5400	210
8/24/15	#1	26.6	>16,000	23
8/24/15	#2	26.6	2400	9.1
8/24/15	#2	26.7	700	9.1
8/24/15	#3	26.3	2400	93

All shellfish samples contained excessive bacteria; FC > 230 MPN/100g
3 of 5 Seawater Samples – FC exceeds 14 MPN/100 mL
Emergency closure of lease area effective 8/27/2015
*First closures of floating oyster culture sites in New York

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2016 Shellfish Meat, Seawater and *Vp* Results 4 Oyster Farms, Great South Bay

Date	Site	Oyster FC MPN/100g	Oyster E.c. MPN/ 100g	Seawater FC MPN/100mL	Total Vp tlh+ CFU/g	Pathogenic Vp tdh+ CFU/g	Pathogenic Vp trh+ CFU/g
7/25/16	#1	1400	330	460	70/<100	<10,<10	<10,<10
7/25/16	#2	1700	1700	7.3	400/200	<10,<10	<10,<10
7/25/16	#3	5400	5400	23	800/400	130,80	50,80
7/25/16	*#4	170	68	23	100/<100	<10,<10	<10,<10

Sites 1-3 failed for excessive bacteria in shellfish meat samples;
FC > 230 MPN/100g
Site #3 – Pathogenic *Vp* (tdh+ and trh+)
Emergency Closure Implemented July 27, 2016
*Site #4 (submerged gear); no closure

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2017 Shellfish Meat and Seawater Results
4 Oyster Farms, Great South Bay

Date	Site	Oyster FC MPN/100g	Oyster E.c. MPN/100g	Seawater FC MPN/100mL
7/17/17	#1	>16,000	3500	43
7/17/17	#2	330	170	9.1
7/17/17	*#3	78	20	3.6
7/17/17	*#4	<20	<20	9.1

Sites 1 and 2 failed for excessive bacteria in shellfish meat samples;
FC > 230 MPN/100g
Emergency Closure Implemented
*Sites 3 and 4 (submerged gear); no closure

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2018 Water Quality and Shellfish Results

2 Oyster Farms, Great South Bay

					Shellfish	Shellfish	Seawater
Date Collected	Sample #	Sample Type	SGA or Lot/Site	Water Depth (ft)	FC MPN/100g	E. coli MPN/100g	FC MPN/100mL
7/16/2018	1	Oyster	Grower 1: South Central	3.5	230	130	43
7/16/2018	2	Oyster	Grower 1: North Central	3.5	330	330	43
7/16/2018	3	Oyster	Grower 1: Western Central	3.5	1,100	460	93
7/16/2018	4	Oyster	Grower 2: Central Submerged Trays-Middle	3.0	3,500	1,100	93
7/16/2018	5	Oyster	Grower 2: Central Floating Bags - South	3.0	16,000	2,800	43

- Two Growers: only one with bird deterrents
- Adverse fecal contamination impacted both farms
- Be kind to your neighbor (adjacent farm)

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What Can Be Done To Mitigate

Bird Deterrents

PROS

- Cheap
- Easily installed
- Effective

CONS

- Easily compromised
- Periodic maintenance
- Potentially introduces more plastic pollution
- Bird entanglements

Bird Deterrents – Zip Ties

PROS

- Cheap
- Easily Installed

CONS

- Questionable effectiveness (function of number & length?)
- Potentially introduces more plastic pollution

*May need to be used with other deterrent methods

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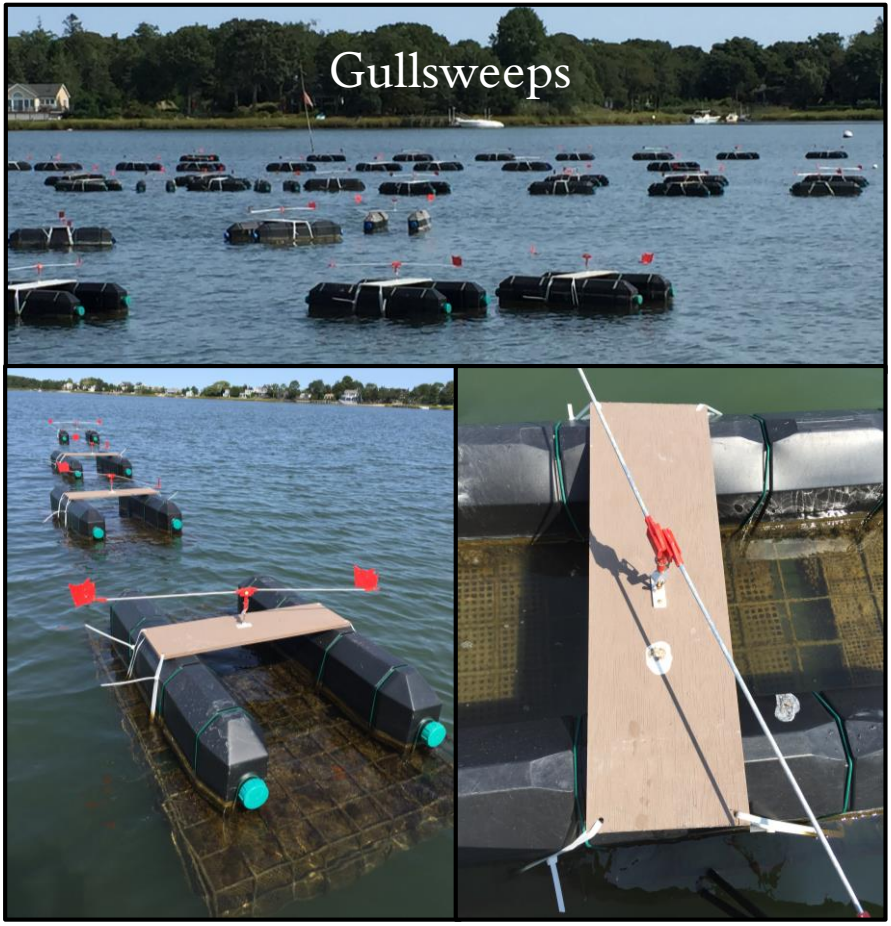
Bird Deterrents – Gullsweeps



PROS

- Effective
- Easy to install with plywood, drill and zip ties

CONS

- Expensive
- Only feasible for OysterGro-style cages?
- Reduced effectiveness during longer periods of calm weather
- Increase likelihood of NIMBY issues in some locations?

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Gullsweeps
No Gullsweeps

Mitigation: Submerge Gear Prior to Marketing; as determined by Regulatory Authority

Before

After

Mitigation: Site Selection of Shellfish Farm

Spatial planning for new lease areas should consider proximity to seabird habitat, gear-type interactions, density of gear on farm(s) and the potential to create new pollution sources in certified (approved) areas

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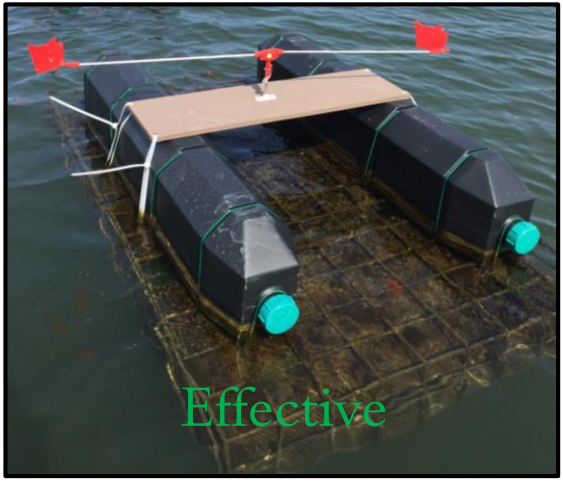
New York State DEC Actions Taken

- Closure of Farm or Farms
- Verify Compliance with Bird Mitigation or Submergence of Gear
- Retesting of Shellfish and Water for Reopening
- Sampling stations added within and adjacent to farms for sanitary surveys
- Recall, if necessary
- Education and Outreach to Growers

Compliance and Effectiveness of Mitigation Measures



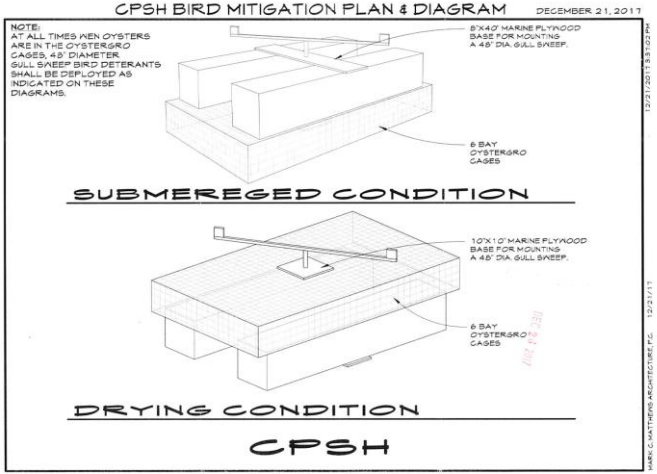
Compliance good by growers with some exceptions

Nice try…

Permitting and Requirements for Bird Mitigation Plans

- Effective 2018, Bird Mitigation Plans required for shellfish aquaculture permits with floating gear; applies to existing and new permits
- Reduced Closures of Farms Needed
- Compliance checks for bird mitigation

Bird Mitigation Plan



- Include detailed written description of deterrents (mitigation)
- Include sketches and photos
- Can deterrents withstand winds and adverse weather conditions
- Can grower conduct their activities of husbandry, harvest and routine activities while deterrents are installed
- Maintenance needed

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Other Issues to Consider for Birds (Pollution Sources): Nearby Structures, Buoys and Lines for Submerged Gear

Summary

- Closures of shellfish farms since 2015 due to excessive fecal contamination in oyster meats and seawater samples from birds
- Confirmation of bird mitigation or submergence of gear required prior to retesting and eventual opening of farm/growing area
- Bird Mitigation Plans required effective 2018 for permitting use of floating gear for shellfish culture
- Compliance from growers was good and reduced closures needed in 2018
- Siting of shellfish farms, floating buoys, gear and other nearby structures need to be considered as potential pollution sources

Acknowledgements

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