New York Aquaculture Producer Survey Results for 2023



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May 2024



Sugar kelp growing on rope, a pile of oyster, and rainbow trout swimming in a tank.

Summary of the Survey Results

The State of New York has a diverse and growing aquaculture industry which produces finfish, seaweed, and shellfish. In the Great Lakes region, there are numerous land-based finfish operations producing fish for restocking public waterways as well as human consumption. The marine region around Long Island is primarily where shellfish and sugar kelp (i.e., seaweed) are produced. A couple of operations in the Great Lakes region produce freshwater mussels for habitat restoration purposes. Aquaponic operations also exist around the state raising fish in conjunction with terrestrial plants. The aquaculture industry in New York supports a large recreational fishing industry by restocking public waterways, it enhances natural populations of shellfish in local embayments which improves ecosystems, and it also provides a local and sustainable source of seafood that can increase food security and support local economies.

To help better understand aquaculture across the state, New York Sea Grant (NYSG) developed an annual survey to collect information from the industry and highlight its impacts. The ten-question survey sought to better understand operation's location, production levels, species produced, types of gear used, and the number of jobs it supported. This voluntary and anonymous survey was distributed in January of 2024 to collect information from the previous calendar year (i.e., 2023). It was sent to 99 known aquaculture operations from all sectors: private, not-for-profit (e.g., Universities, Indigenous Nations, etc.) and governmental (i.e., federal, state, or local municipality) and 70 responses were received. While the results in this report do not represent the industry entirely, but only those respondents, it helps provide insights into statewide aquaculture activities. The goal of this survey is to be distributed annually so the growth and changes of the industry can be measured over time. This annual report will be publicly available and housed on the <u>NYSG website</u>. It will also be used to increase awareness and educate the public about New York's aquaculture industry.

Some key finds based on the survey responses include:

- Most respondents were from Long Island (39) and in the Finger Lakes region (10).
- While the survey indicates that NY has operations over 70 years old, those are run by NY State and focus on stocking and restoration. The private sector, which represented 63% of responses, is relatively new with most operating for less than 10 years.
- Among respondents 56% are producing seafood for consumption, 39% are producing for recreational stocking, bait, and/or restoration and aquaponic plants were produced by 5%.
- New York hatchery operations do not appear to produce enough seed to support the growout operations with 61% of them purchasing seed from out-of-state hatcheries.
- The industry supported 418 jobs with 265 of these being full-time positions.
- Respondents sold 8.2 million pieces of shellfish and 1.7 million pounds of finfish in 2023.
- The top two farmed species among respondents were oyster and trout.

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Key Terms and Definitions

- Aquaponic Plants plants raised in water circulating from tanks that finfish are raised in. This includes consumable produce (e.g., lettuce), cannabis, or decorative plants.
- **Consumption -** to be eaten as a food source by people.
- **Grow-out Operation -** a farm that gets seed from a hatchery and raises it to legal or market size.
- **Hatchery** a facility that spawns adult animals to produce juvenile shellfish or finfish, or produces spools of string set with seaweed spores. A hatchery can also be a grow-out operation.
- **Restoration -** the act of adding finfish or shellfish to a habitat to increase natural populations which may get harvested by recreational fishing activities.
- Seaweed refers to various species of macroalgae. Only sugar kelp is currently raised in New York.
- **Seed** a general term for the juvenile stage of various organisms produced in a hatchery by spawning adults. Seed is raised at a grow-out operation until it reaches market size.
 - *Shellfish seed:* animals <1 year old, typically between 1 and 38mm (1.5") in shell length.
 - Seaweed seed: a spool of string that has had seaweed spores set on the string.
 - *Finfish seed:* includes eggs, fry (juveniles without a yolk-sac), or fingerlings (juveniles about the size of human finger with scales and working fins).
- Shellfish refers to the typical species produced in New York. This currently includes the eastern oyster (*C. virginica*), hard clam (*M. mercenaria*), bay scallop (*A. irradians*), ribbed mussel (*G. demissa*), and freshwater mussels (Unionid family).

Distribution of Aquaculture Operations in New York

The map below was provided in the survey for participants to select which region they are located in.





Age of New York Aquaculture Operations

The below graphs show the range in years that each sector's operations have been open.



Private: Operation owned by an individual or small group that does not receive tax payer funding.
 Not-for-profit: Has 501(c)(3) status. Includes Colleges/Universities and Indigenous Nations.
 Governmental: Receives federal, state, or local funding (e.g., NYSDEC and Town Hatcheries).

Business Classification of Operations

The industry is comprised of 3 different categories and this relates to their funding sources.



Private: Operation owned by an individual or small group that does not receive tax payer funding.
 Not-for-profit: Has 501(c)(3) status. Includes Colleges/Universities and Indigenous Nations.
 Governmental: Receives federal, state, or local funding (e.g., NYSDEC and Town Hatcheries).

Number of Jobs the Industry Supported



Full Time: >30 hours per week for >4 months per year. **Part-time & Seasonal**: Employed <4 months per year.

Number of Hatchery and Grow-out Operations



Hatchery Operation: A true hatchery that produces shellfish and finfish by conditioning and spawning adults. **Grow-out Operation**: Acquires seed/eggs/fingerlings from a spawning operation and raises them on their farm. **Both**: May spawn some species but also acquire seed from other hatcheries.

Source of Seed

Grow-out operation responders (see above) were asked where the hatchery they get their seed from is located.



Seed includes juvenile shellfish, finfish (eggs, fry, or fingerlings), and/or seaweed spools produced in a hatchery and then sold to grow-out operations.

Aquaculture Production Systems

This graph shows the various types of systems that are used and by how many operations.



Operations may use multiple systems (i.e., shellfish: floating & bottom gear, finfish: ponds & flow-through)

Flow-through: Systems that draw water from a source (marine, river, or groundwater), and distribute it through their operation's tanks before discharging it. Includes shellfish hatcheries and finfish operations.

RAS: Recirculating aquaculture systems are newer technology that reuse the water by filtering it over and over with minimal discharge. Includes finfish and aquaponic operations.

Ponds: Typically a seasonal system, they're often man-made; shallow and drainable, making it easy for harvest.

Floating gear: Floating systems (e.g., cages, docks, lines) for raising shellfish and/or seaweed.

On-bottom gear: Shellfish cages that sit on the bay bottom and are hauled up for maintenance and harvest.

Other: Includes laboratory aquaria system and brokerage of sales.

Aquaculture Product Categories

The below graph shows the general product distinction that exists in New York. Shellfish and finfish can be produced for restoration and/or consumption.



Operations may produce for multiple categories (i.e., for restoration AND consumption).

Shellfish for restoration: Generally produced by not-for-profits and municipal hatcheries. Includes species such as hard clam, oyster (single set & spat on shell), bay scallop, ribbed mussel, and freshwater mussels.

Shellfish for consumption: Primarily comprised of single set oyster but may include hard clam.

Finfish for stocking/bait: Species for stocking waterbodies, used as bait, and also ornamentals (e.g., koi).

Finfish for consumption: Various species of fish raised as a food product for people.

Seaweed: Primarily sugar kelp. Includes hatchery production of seed spools sold to growers.

Aquaponic Plants: Includes consumable produce (e.g., lettuce), cannabis, and landscaping plants.

Top Species Produced

Participants were given a list of 10 choices and asked to choose which species they produced the most.



Most operations produce multiple species but they were asked to select which species they produced the most of or which had the most value. Often this would be the same species but for some finfish operations, they may produce larger quantities of baitfish at lower values than other species they also produce.

Trout Species: Such as Brook, Tiger, Brown, Steelhead, and Rainbow.

Other includes: Walleye, Tiger musky, Lake Sturgeon, Freshwater mussels, Muskellunge, and Bloater.

Baitfish / Ornamentals: Such as Minnows, Koi, Shiners, Goldfish, etc.

Salmon Species: Such as Atlantic, Chinook, and Coho.

Aquaponic Plants: Includes consumable produce (e.g., lettuce), cannabis, and landscaping plants. **Seaweed:** Currently only sugar kelp.

Total Production

Each operation was asked for an estimate of their total production and those values were rounded. The table below provides a breakdown of the industry's production levels. For each type of product, the maximum amount reported by any single operation is listed, along with the average amount produced, the number of responses and total sum produced. Operations could report values under multiple categories depending on the business.

Operation Type	Maximum	Average	Responses	Sum
Shellfish Hatchery (seed)	50,000,000	10,400,000	15	156,000,000
Shellfish Farmers (pieces)	1,800,000	295,000	28	8,260,000
Finfish Hatchery (seed)	230,600,000	27,140,000	17	461,300,000
Finfish Farms (pounds)	652,000	109,000	16	1,740,000
Seaweed Nursery (spools)	54	25	6	150
Seaweed Farmers (pounds)	20,000	10,000	2	20,000
Aquaponic Plants (pounds)	160	92	5	460

Shellfish Hatchery: Number of seed produced via hatcheries for restoration and/or sold to growers.
Shellfish Farmers: Number of legal size pieces of shellfish sold for consumption (typically) purposes.
Finfish Hatchery: Number of eggs, fry, and/or fingerlings produced from spawns that were sold or stocked.
Finfish Farms: Pounds produced for restoration and/or consumption purposes, includes aquaponics.
Seaweed Nurseries: Number of kelp spools produced.

Seaweed Farmers: Pounds of sugar kelp produced and harvested.

Aquaponic Plants: Pounds of consumable produce/terrestrial plants. Pounds of fish in finfish farm category.

Product Distribution Methods

Survey participants were asked to choose which method(s) they use to distribute their products and how often.



Direct to Consumer: Selling product directly to individual(s) consuming the product.

Restaurants: Selling directly to restaurants, caterers or other food service companies.

Wholesaler: Selling directly to business that distributes at wholesale prices to other businesses.

Retail Outlet: Selling directly to a store that sells to customers.

Direct to a Grower: Sell juvenile shellfish or fish (eggs, fry, fingerlings) to farmers that will raise product.

Restoration: Putting shellfish seed or fish in public waterbodies for restoration and stocking purposes.

Other: Includes distribution to other state hatcheries (rarely) and to food pantries (occasionally).

Aquaculture and Seafood Resources

New York Sea Grant staff have created a variety of additional resources. To learn more about aquaculture and seafood safety, visit the various links listed below.

NY Sea Grant Aquaculture: www.nyseagrant.org/aquaculture

NY Aquaculture Fact Sheet: bit.ly/AquacultureFacts

NY Aquaculture: Status, Updates & Opportunities: bit.ly/Aquaculture_Report

NY Aquaculture Needs Assessment Summary: bit.ly/NeedsSummary

NY Aquaculture Needs Assessment Report: bit.ly/NeedsReport

NY Aquaculture Workgroup Site: <u>blogs.cornell.edu/aquaculture-pwt/</u>

Annual New York Seafood Summit Event: www.nyseagrant.org/seafoodsummit

Seafood Processing & Marketing Resources: <u>www.nyseagrant.org/seafoodguides</u>

Seaweed Processing & Marketing Resources: www.nyseagrant.org/seaweedguides

Seafood Marketing and Education: <u>www.nyseagrant.org/seafoodmarketing</u>

Seafood Nutrition Cards: blogs.cornell.edu/nysgmarketing/nutrition/

Seafood Marketing Resource Cards: blogs.cornell.edu/nysgmarketing/marketing

Seafood Safe Handling Resource Cards: blogs.cornell.edu/nysgmarketing/seafood-cards/

Visit the NY Sea Grant homepage to learn about all our other work: www.nyseagrant.org/



This survey and publication was funded through NOAA Sea Grant: Aquaculture Supplemental, award NA22OAR4170230.

New York's Sea Grant Extension Program provides Equal Program and Equal Employment Opportunities in association with Cornell Cooperative Extension, U.S. Department of Agriculture and U.S. Department of Commerce and cooperating County Cooperative Extension Associations.

New York Sea Grant is part of a nationwide network of 34 university-based programs working with coastal communities through the National Oceanic Atmospheric Administration (NOAA). Sea Grant research and outreach programs promote better understanding, conservation, and use of America's coastal resources. Sea Grant is funded in New York through SUNY and Cornell University and federally through NOAA.