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# 2020 Chinook Salmon Stocking

March 18, 2020

# Outline

- Background on Chinook salmon stocking and the pen-rearing program
- Lake Ontario salmon and trout stocking strategy
- Description of the Chinook salmon fishery
- Chinook salmon coded wire tagging study results
- How stocking influences the Chinook salmon fishery
- Fisheries management outcomes for Chinook salmon stocking
- 2020 Chinook salmon stocking numbers by site
- Frequently asked questions



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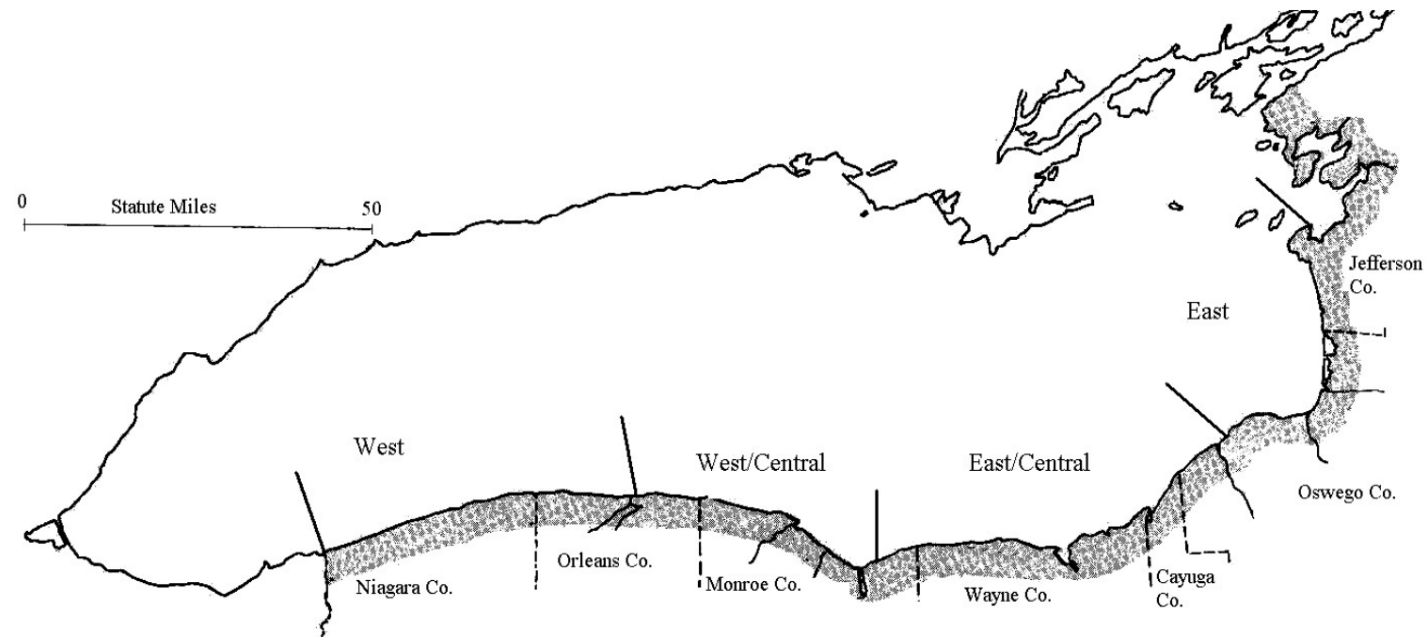
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# Lake Ontario geographic areas

DEC monitors the Lake Ontario fishery annually and reports results based on four geographic lake areas

- West
- West Central
- East Central
- East



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# Examples of ports within each geographic area

## West

- Fort Niagara
- Wilson
- Olcott
- Oak Orchard

## West central

- Sandy Creek
- Genesee River
- Irondequoit Bay

## East central

- Sodus Bay
- Little Sodus Bay
- Oswego

## East

- Little Salmon River
- Salmon River
- Association Island Cut



# Chinook salmon stocking

- Chinook salmon stocking numbers were reduced in 2017, 2019, and 2020 due to concerns over predator prey balance in Lake Ontario
- More information on why stocking numbers were reduced can be found here: <http://www.dec.ny.gov/outdoor/111196.html>
- New York's 2020 stocking target for Chinook salmon is 845,568
- Most of the Chinook salmon stocked in 2020 will be raised in the pen-rearing program



# Pen-rearing program

- Chinook salmon and steelhead are stocked into holding pens and cared for by volunteers for 21 days prior to being released
- Pen-rearing Chinook salmon has been shown to increase post stocking survival by 2X compared to direct stocked fish
- Pen-reared Chinook salmon also tend to have improved imprinting, resulting in improved adult returns to the stocking location at most sites



# 2020 Chinook Salmon Stocking Overview

- 545,368 Chinook salmon will be raised in the pen-rearing program in 2020
- The remaining 300,000 Chinook salmon will be stocked in the Salmon River as broodstock
  - These fish are held in the hatchery until they reach a size of 60 fish per pound
  - These fish are typically larger than pen-reared Chinook salmon and have post stocking survival similar to pen-reared fish



# Lake Ontario Stocking Strategy

- DEC is developing a new Lake Ontario salmon and trout stocking strategy
  - A plan that outlines where, when, how many, and what life stage we will stock each species of salmon and trout in Lake Ontario
  - DEC is working with the Lake Ontario Fisheries Management Focus Group (8 open lake anglers and 8 tributary anglers) and consulted the Group for initial public feedback on this Chinook salmon stocking strategy





# Lake Ontario stocking strategy

- Why do we need a new salmon and trout stocking strategy?
  - Current Lake Ontario salmon and trout stocking allocations were set decades ago based on shoreline distance within each DEC Region
  - Current allocations do not necessarily account for:
    - Angler preferences
    - Fishing effort in a particular area
    - Geographic and seasonal differences in fish distribution
    - Potential to benefit both open lake and tributary fisheries



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# An outcome based approach

- DEC is using an “outcome based” approach to develop new Lake Ontario salmon and trout stocking strategies:
  - Define the specific fisheries management outcomes that we want to achieve from our salmon and trout stocking program
  - Develop stocking allocations that contribute to achieving those outcomes



# Chinook salmon

- Fisheries management outcomes for the Chinook salmon stocking were based on the following:
  - DEC's management philosophy for Chinook salmon
  - How the Chinook salmon fishery currently operates
  - How stocking location influences the Chinook salmon fishery



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# Chinook salmon

- Chinook salmon management philosophy
  - Chinook salmon provide the primary fishery in Lake Ontario and are an important component of the fall tributary fishery



# Chinook salmon fishery

The Chinook salmon fishery has three distinct phases:

## Open lake mixed fishery

- The mixed fishery occurs from April – July when fish from all stocking and wild production sites are mixed throughout the lake.

## Staging fishery

- The staging fishery occurs during August and September as mature fish move toward/stage near, and ultimately return to their stocking location or natal stream.
- Note - the transition between the open lake mixed fishery and the staging fishery is gradual and does not necessarily occur on August 1.

## Tributary fishery

- Chinook salmon are the most abundant and most sought after salmonine species in Lake Ontario tributaries during September and October.



## How stocking influences the Chinook salmon fishery

- Pen-reared and direct stocked Chinook salmon stocked in 2010, 2011, and 2013 were adipose fin clipped and coded wire tagged, allowing us to identify the specific stocking location for angler caught fish in the open lake, staging, and tributary fisheries.
- Results of the study indicate:
  - Pen-reared Chinook salmon survive, on average, twice as well as direct stocked fish
  - Pen-rearing also provided improved imprinting, and adult returns, to the stocking location at some sites and in some years



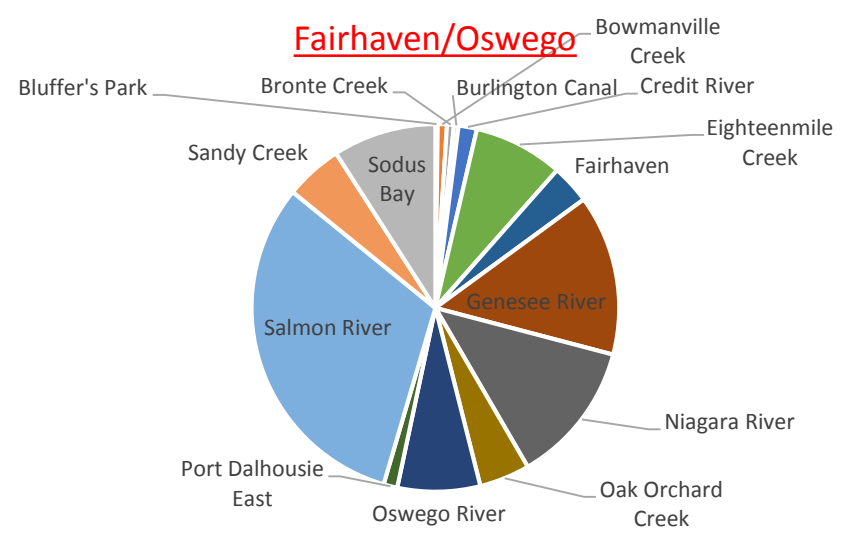
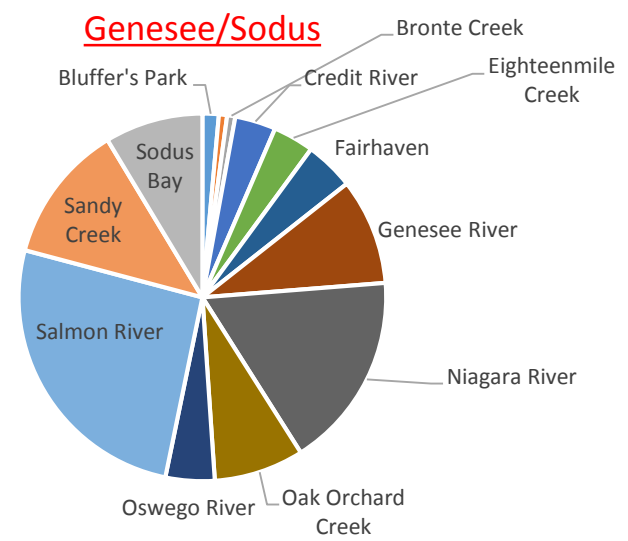
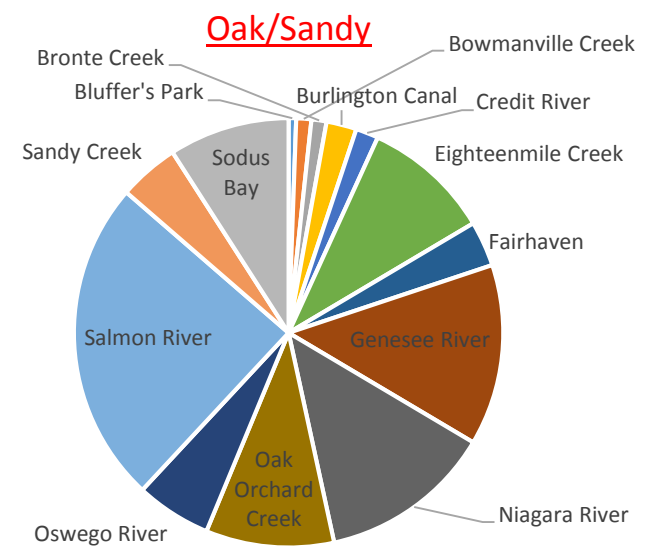
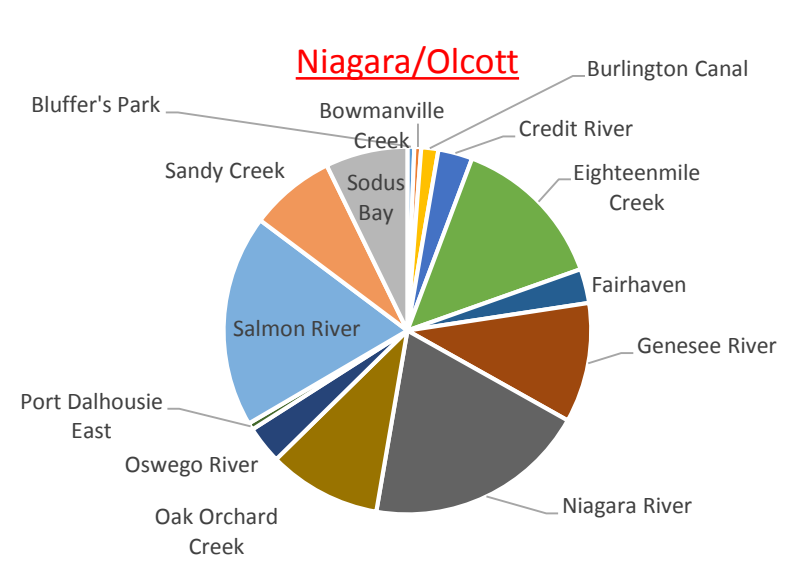
## How stocking influences the Chinook salmon fishery: Open Lake

- **Chinook salmon harvested by anglers at a given port from April – July were comprised of fish stocked at sites throughout the lake, indicating a well mixed population**
  - On average, only 10% of the Chinook salmon harvested at a specific port, from April – July, were stocked at that port
  - The majority of Chinook salmon harvested at a specific port from April – July were stocked at locations greater than 20 miles away (see next page)
  - Pen rearing improves the open lake fishery only due to improved fish survival
- Complete reports on the coded wire tagging study is available in Section 3 of the 2016 and 2017 Lake Ontario annual reports
  - 2016 [https://nysl.ptfs.com/data/Library1/Library1/pdf/889897048\\_2016.pdf](https://nysl.ptfs.com/data/Library1/Library1/pdf/889897048_2016.pdf)
  - 2017 [https://nysl.ptfs.com/data/Library1/Library1/pdf/889897048\\_2017.pdf](https://nysl.ptfs.com/data/Library1/Library1/pdf/889897048_2017.pdf)



# Chinook salmon population is mixed April-July

## Stocking locations of fish caught in four areas



- Total recoveries of coded wire tagged Chinook salmon from the 2010 year class from April – July
- The underlined label at the top of each pie chart (for example Niagara/Olcott) indicates the port where the fish were harvested. The labels on each color of the pie indicate where the fish was stocked
- **At every locale, the vast majority of Chinook salmon harvested in a given area from April through July were not stocked there.**



## How stocking influences the Chinook salmon fishery: Staging and Tributary

- **Staging and tributary fisheries are greatly influenced by stocking location**
  - Chinook salmon straying is relatively low in Lake Ontario
  - Chinook salmon tend to return to the tributary where they were stocked
  - Chinook salmon that do stray tend to stray to nearby sites
  - Straying back to Salmon River Hatchery is generally low, only about 10% of the stocked Chinook salmon sampled at the hatchery are from other stocking locations
    - Stocking locations without significant tributaries (Sodus Bay and little Sodus Bay) tend to stray back to the hatchery more than other sites
  - Pen-reared Chinook salmon tend to imprint and return to the stocking site better than direct stocked fish



# Fisheries management outcomes

- Desired fisheries management outcomes for Chinook salmon stocking are primarily based on the staging and tributary fisheries because stocking location has no influence on where Chinook salmon are caught in the open lake mixed fishery from April - July



# 2020 Chinook salmon stocking strategy

Given our current stocking target of 845,568 Chinook salmon we have two options:

1. Continue to distribute stocked fish evenly around the lake
  - May result in poorer survival of stocked fish and lower catch rates in staging/tributary fisheries at many locations
2. Concentrate our stocking at fewer locations
  - Should provide higher catch rates in staging/tributary fisheries at a few locations
  - **Concentrating stocking and providing high catch rate fisheries is the best use of stocked Chinook salmon**



# 2020 Chinook salmon stocking strategy

Desired fisheries management outcomes for Chinook salmon stocking:

1. Provide sufficient adult returns to Salmon River Hatchery so that Chinook salmon egg take targets can be met for all Lake Ontario stocking sites
2. Provide a minimum of one high catch rate staging and tributary fishery within each of the four Lake Ontario geographic areas:
  - West: Eighteenmile Creek
  - West Central: Genesee River
  - East Central: Oswego River
  - East: Salmon River
3. Provide additional staging and tributary fisheries at Niagara River, Oak Orchard Creek, and Black River



# 2020 Chinook salmon stocking strategy

- Chinook salmon stocking will be concentrated at seven locations in 2020
- These stocking locations all have a history of high fishing effort in both the open lake and staging/tributary fisheries
- Some locations where Chinook salmon have traditionally been stocked will not be stocked in 2020
- The decision to stop stocking some locations, including some pen-rearing projects, was not taken lightly and was done with the best interest of the overall Lake Ontario fishery in mind



# 2020 Chinook salmon stocking numbers

## Concentrates stocking at high fishing effort locations

- Eighteenmile Creek
- Oak Orchard Creek
- Genesee River
- Oswego River
- Salmon River

## Provides a lower number of fish two additional locations

- Niagara River
- Black River

## No stocking

- Wilson (pen)
- Sandy Creek (pen)
- Sodus Bay (pen)
- Little Sodus Bay (pen)
- South Sandy Creek (direct)

Lower Niagara River	50,000 (Pen)
Wilson	0
Eighteenmile Creek	111,392 (Pen)
Oak Orchard Creek	111,392 (Pen)
Sandy Creek	0
Genesee River	111,392 (Pen)
Sodus Bay	0
Little Sodus Bay	0
Oswego River	111,392 (Pen)
Salmon River	300,000*
South Sandy Creek	0
Black River	50,000 (Pen)
<b>Total</b>	<b>845,568</b>

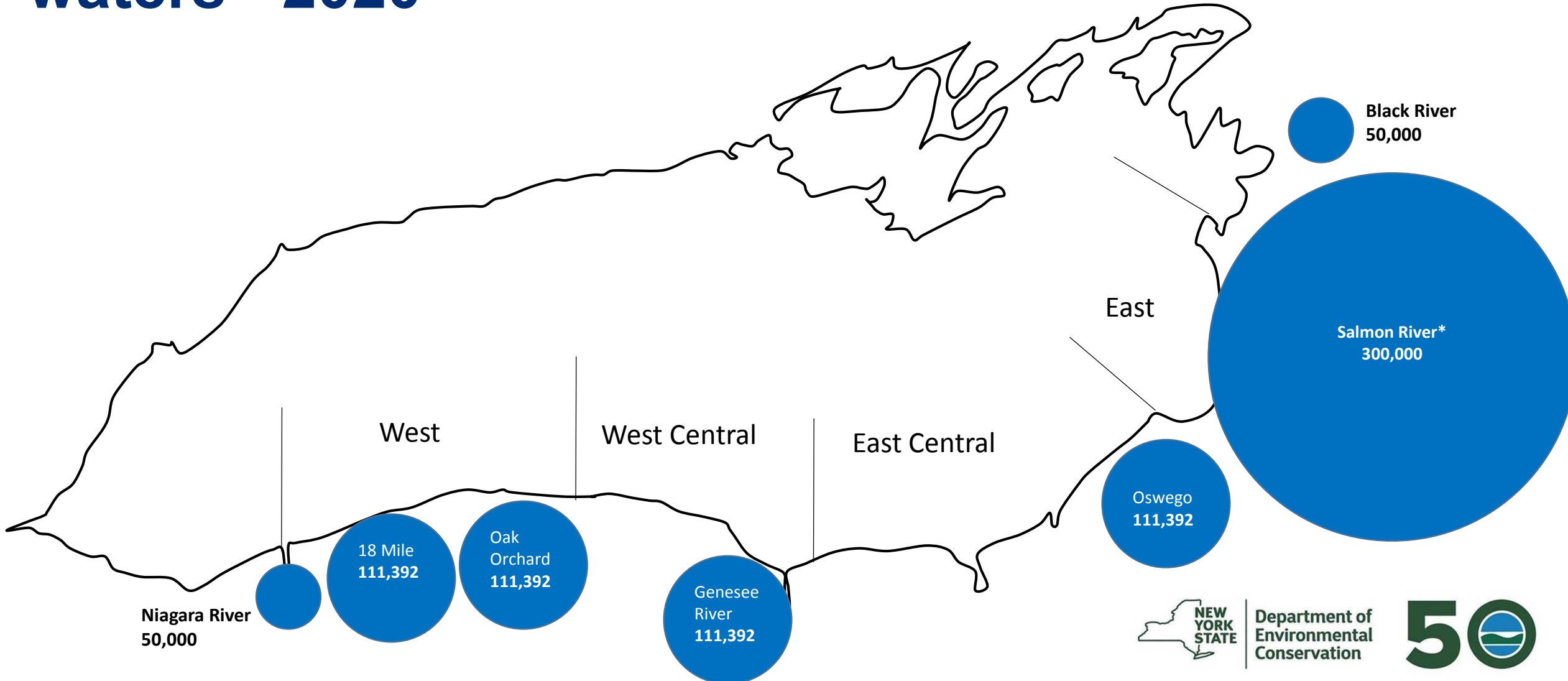
\*Salmon River has a higher stocking number due to egg collection needs at Salmon River Hatchery



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# Concentrated Chinook salmon stocking at top waters - 2020



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# Frequently asked questions

- Why does Salmon River need to have a higher stocking number than the other locations?
  - Chinook salmon stocked in the Salmon River support Salmon River Hatchery (SRH) egg collections for stocking at all NY sites. Only about 10% of “wild” Chinook salmon enter the SRH. DEC is taking a risk averse approach to help meet egg collection targets.
- Why do lower stocking numbers potentially result in poor post stocking survival?
  - Recently stocked fish are highly susceptible to predation by both fish and birds. Stocking large numbers of fish creates a buffer, where there are simply more stocked fish than predators can consume. When fewer fish are stocked, a greater proportion of the stocked fish are likely to eaten by predators





# Frequently asked questions

- Does raising fewer Chinook salmon in a pen produce larger fish that have better post stocking survival?
  - Chinook salmon rearing density differs between pen projects depending on logistical constraints at each site. Some sites have held Chinook salmon at lower densities, and it has not meaningfully improved growth compared to sites rearing fish at higher densities. Also, lower stocking numbers can reduce post stocking survival.
- Do some pen-rearing projects produce larger fish and/or have better post stocking survival?
  - All pen projects have been able to consistently raise Chinook salmon that have met or exceeded the target size for release from the pens (90 fish per pound). Survival varies across sites and years, but overall study results showed improved post stocking survival at all pen project sites



# Thank You

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