

BIOLOGICAL REGIONALISM: OSVEGO RIVER & LAKE ONTARIO Central New York, USA

ALBERTO REY

with Essays by:

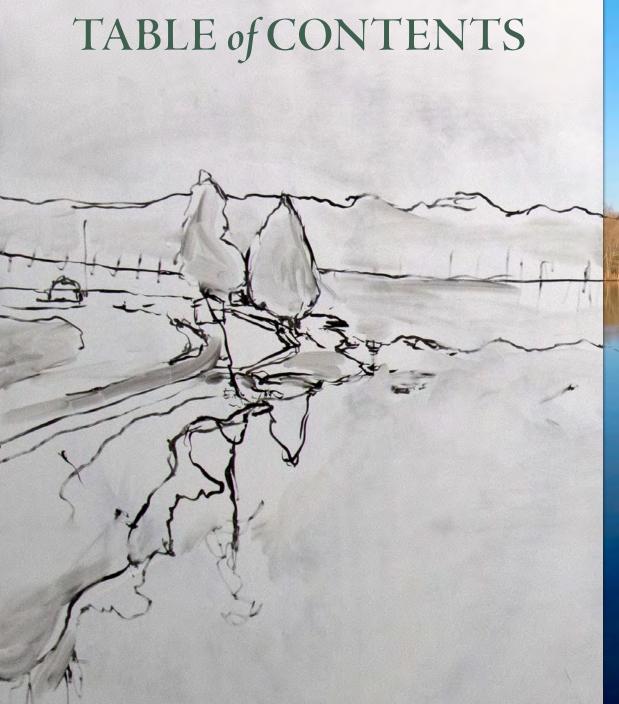
C. ERIC HELLQUIST

KRISTEN HAYNES

KAMAL I. MOHAMED

& Book Design by:
MATTHEW MATEOSIAN





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A Note from the Curators

Upon discovering Alberto Rey's creative endeavors several years ago, it was quickly clear that a collaboration with SUNY Oswego's Tyler Art Gallery was a logical if not pre-ordained next step. His Biological Regionalism series of exhibitions based new artworks on intense study of and focus on specific places with waterways as a broadscale feature. Given the importance of Oswego resting at the juncture of the Oswego River and Lake Ontario, it has long been hailed as "The Port City". Simultaneously, the college's Grand Challenges educational theme at that time was "Freshwater for All".

An extended series of creative research visits and meetings ensued that were necessary for Alberto to gain a deep understanding of this local subject and determine the best approach to a newly-created series of artworks and this attendant publication.

Throughout the extensive process, Alberto's prior experience, dedication and full commitment were evident and impressive; yielding widely impactful results. We sincerely hope this exhibition will serve as a point of reflection and appreciation for all viewers and its contents will continue to do so for many years to come as these works become part of the college's permanent art collection.

Of course, a project of this scale requires the assistance of many contributing partners. Perhaps most important of these were Rice Creek Field Station and members of the college's Biological Sciences Department. Contributing greatly to various project activities were Rice Creek Field Station Director Kamal Mohamed and Associate Director Kristen Haynes. Eric Hellquist, Rick Back, and other biology faculty contributed as well. David White, Associate Director of New York Sea Grant, contributed valuable resources from that organization. Oswego County Soil and Water's District Manager Joe Chairvolotti and Sr. District Technician

Erica Schreiner were willing partners. The H. Lee White Marine Museum's Executive Director Mercedes Niess and Curator Michael Pittavino were eager to assist. Oswego County Historian Justin White and Erie Canal Museum Executive Director Natalie Stetson discussed local history with Alberto. The Anthropology Department's Michael Chaness discussed significant first nation connections to the region. Mindy Ostrow and Bill Reilly of River's End Bookstore hosted a catalog signing event. Artists Suzanne Beason and Anita Welych taught topical public art workshops. Art professor Benjamin Entner and the Office of Sustainability staff gathered their students to create an outdoor sculpture that spread public awareness about the importance of freshwater. Lastly, School of Communication, Media and the Arts Dean Julie Pretzat and Art Department Chair Kelly Roe provided their advice and support throughout the project.

Financial support for Biological Regionalism: Oswego River and Lake Ontario came from many sources and was reliant on the expert help and advice from the Office of Research and Sponsored Projects. Vital support came from ARTSwego, CNY Arts, Grand Challenges SUNY Oswego, NOAA Sea Grant, Rice Creek Association, Richard S. Shineman Foundation and the Student Art Exhibition Committee/Student Association.

Michael Flanagan

Director

TYLER ART GALLERY

Miranda Traudt

Director of Arts Programming

ARTSWEGO

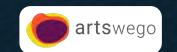














Also Supported by A SUNY OSWEGO GRAND CHALLENGES FRESHWATER FOR ALL GRANT



THE OSWEGO RIVER

Essay by C. Eric Hellquist Associate Professor Department of Biological Sciences STATE UNIVERSITY OF NEW YORK OSWEGO

Artwork by Alberto Rev Distinguished Professor Department of Visual Arts & New Media STATE UNIVERSITY OF NEW YORK FREDONIA

its surrounding watershed. The history of any river is reunite with the ocean. Every location on the eventually move to the lowest elevations of its basin via addition of pollutants will be perpetuated additively sends water out to Lake Ontario like an open nozzle.

along the elevation gradient that water travels. Whether it's moving rapidly or slowly or imperceptibly,

water is always going somewhere. The story of the Oswego River is ultimately the story of the origin of its water, its movement, and its connectivity to the central New York landscape. Whether sailing on Canandaigua Lake, exploring Watkins Glen State Park, bass fishing on Oneida Lake, attending class high above Cayuga's waters in Ithaca, attending the State Fair in Syracuse, or salmon fishing in Oswego, you are in the Oswego River watershed interacting with its water. The Oswego River watershed is a 5,100 square mile bowl irregularly defined by topographic boundaries

and water below the surface, are the circulatory systems bringing water into ponds, lakes, and aquifers for temporary storage in each watershed. **As** Having resided in the lowest elevations with all of watersheds for days, decades, centuries rivers, the history of the Oswego or even millennia, water will eventually drain River is defined by its natural attributes and those of into the next lowest watershed and ultimately also the history of the society that resides on its banks. land is located in at least several watersheds depending Watersheds unite the air to the land to the water via on the scale of interest. The quality of our water is the perpetual motion of the water cycle. Watersheds determined by the conditions that surround it. Water quality

gravity.

Streams and

rivers on the surface,

shaped by bedrock, glaciers, and human engineering. The watershed is tipped over 600 feet from south to north pouring its water into Lake Ontario. The watershed collects water from the Appalachian Plateau, the Tug Hill Plateau, and the Lake Ontario coastal plain. All water that drains into the Finger Lakes from surrounding uplands eventually drains into the Clyde River, Seneca River, Oneida River and the New York State Barge Canal. At the confluence of the Oneida and Seneca Rivers, the Oswego River officially begins collecting 96% of the water from the watershed. The 23 mile long channel of the Oswego River are irregularly shaped networks of interlocking basins is only as clean as the air above it and the integrity of flows through a narrow constriction at the northern that capture, store and move water from basin to basin. the surrounding land. Any damage, whether forest extent of the greater watershed. Along this stretch the Rain and snow that lands within one watershed will removal, creation of impermeable surfaces, or the water is concentrated by high elevation contours that

submerged and replaced by eight locks. The river drops another 125 feet directing central New York's water downhill to Lake Ontario where it will remain for about six years until it passes into the St. Lawrence River on its way to the Atlantic Ocean. The 23 mile long Oswego River reach streams across three distinct bedrock types that are approximately 440 million years old. These sedimentary formations date back to a time when the region was covered by a vast ocean. However, the identity of the modern Oswego River begins with ice. The most recent continental ice sheet began its irregular retreat from central New York between 14,000-15,000 years before present. As the tremendous mass of ice receded northward, its meltwater sculpted the basins and steep banks of what would become the Oswego River reach and watershed in addition to the massive basins that would become the footprints of the modern Great Lakes. Glacial Lake Iroquois (ca. 14,500 years before present) was the first lake to occupy where Lake Ontario is now. By 13,500 years, Glacial Lake Iroquois would have covered the entire Oswego River reach. To the north, Glacial Lake Iroquois' waters met the wall of the retreating continental ice sheet. On its southern shoreline, the land would have been strewn with rocky debris, a haphazard chaos of braided stream channels forming networks of sediment laden deltas. Scattered remnants of ice would be above and below the surface of plains of gravel deposited by glacial meltwater. Thousands of spoon-shaped and linear drumlin hills gave contour to the land, all pointing in the direction of ice retreat. In other areas, narrow, steeped sloped, subglacial casts of stream channels (eskers) snaked across the land. Basins in this landscape would accumulate water to eventually define the boundaries of today's wetlands and water bodies. It is through this landscape that the ancestral Oswego River cut its first channel.

It was once a wild river with a channel cut by unimpeded water. Today the dozens of rapids and falls have been



"A river, though, has so many things to say that it is hard to know what it says to each of us."

Norman Maclean

As human generations pass, we lose the stories related by earlier generations. Our forefathers knew a world that no longer exists. Memories of experience and abundance fade from today's reality. The depleted reality of today appears less dire, because the memory of what was is gone.

At first glance, the Oswego River looks just fine. But we've inherited a river where the runs of Atlantic Salmon are gone, the salmon that do run are from the Pacific Ocean, but the fish can only go as far as an engineered channel with allow. Along the cement and steel reinforced banks at the mouth of the Oswego River, fish from the Black Sea eat mussels from the Black Sea. The beaver have returned, but they swim among invasive plants from other regions. The bald eagles perch over the river to hunt or scavenge fish laced with the chemicals from industrial research laboratories. Today, we see a river that has been burdened by its human history, but we also see a river that can be released from those impacts and restored to more of what it once was.

How someone regards the river (clean, polluted, damaged, recovered) depends on personal



Biological Regionalism: Oswego River, Oswego, Central New York, USA OILS ON WOOD PANEL 36in.x48in.

context. If you don't know what has been lost, how do you prevent further depletion? What defines success for one generation would be another generations definition of failure. The story of the Oswego River and its watershed is a story of change, shifting baselines, and expectations. Today's residents only can refer to what they've inherited. Simultaneously, they are faced with passing on a watershed at the precipice of the greatest environmental challenge ever faced by global humanity.

...But the Oswego River wasn't always in such a predicament. There were people who knew the river when it was young.



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region, human occupation of the Oswego River basin began. By 13,000 years and balsam fir. The Oswego River was now surrounded by boreal forest. After ago the ancestors of Haudenosaunee arrived in the Oswego River watershed. another 3000 years of warming, spruce were replaced by pines. Forest canopies They traveled in bands and left behind their stone tools with enough frequency were closing and new species of animals were moving in. The people of the region to reveal that they occupied the Oswego River watershed in some of the highest concentrations known in present day New York. Their population densities were low, bands were small, and they were highly mobile. They followed herds continued to live throughout the Oswego watershed as its forests continued

of caribou across a landscape similar to the modern Arctic with sparse, low vegetation characterized by grasses, sedges, stunted willows and other woody species.

These first peoples carried stone tools quarried from bedrock within the region that would have been used for hunting and domestic purposes. Their occupation sites suggest short seasonal

stays in locations where access to food was likely in a landscape that was greening by a diverse mixed deciduous forest courtesy of our modern climate. The as the climate warmed. One excavated encampment was located on the highest Haudenosaunee settled extensively throughout the entire Oswego River point of a drumlin overlooking the drainage of an Oswego River tributary. This watershed. Forests of beech, maple, oak, birch, pine and hemlock provided food, vantage point likely provided access to migratory prey such as caribou that raw materials for housing and transportation and attracted an abundance of passed through the lowlands between drumlins. It was occupied on at least eight animals for hunting. Within permanent villages, the Haudenosaunee worked different occasions indicating its access to animals was reliable enough to warrant pottery and developed an agricultural culture based on corn, beans, and squash. repeat visits.

ice, and temperate species moved in from the south. As the ice moved farther of the lake.

When the continental ice sheet of the last glaciation left the central New York northward, coniferous trees began to arrive, especially spruce with scattered larch would have shifted their diets to moose and deer with caribou now absent.

Ancestors of the Haudenosaunee, specifically the Onondaga Nation,

to change in response to an increasingly benign, temperate climate. The river and tributaries and the forests sustained the people. Haudenosaunee ancestors began to travel less as their environment warmed and stabilized. They became partially nomadic hunters and fishers and adopted burial rituals to honor their dead.

The Oswego River became surrounded

During these 13,000 years of change, the Oswego River would continue to By 11,000 years before present, climate warming was becoming more provide the Haudenosaunee people with a wealth of fish as well as an ideally pronounced. Sub-arctic assemblages of plants and animals moved north with the placed travel corridor. The river linked the abundance of the forest to the vastness



"Sometimes, if you stand on the bottom rail of a bridge and lean over to watch the river slipping

slowly away beneath you, you will suddenly

know everything there is to be known."

A. A. Milne

"The Oswego, below the falls, is a more rapid, unequal stream than it is above them. There are places where the river flows in quiet stillness of deep water, but many shoals and rapids occur; and at that distant day, when everything was in its natural state, some of the passes were not altogether without hazard... then, indeed, not only vigilance, but great coolness, readiness, and strength of arm became necessary, in order to avoid the dangers."

James Fenimore Cooper

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The first Europeans arrived at the Oswego River in 1615 and encountered stunning, vast, forests and a convenient, but formidable river to access the wealth of wood and fur-bearing animals. They also encountered the Haudenosaunee who lived in the forests and fished the river. During the contact period, small indigenous settlements were located in the vicinity of the Oswego Falls at present day Fulton and another on an island in the river near present day Phoenix. At these locations, fishing was central to daily life.

While the Haudenosaunee saw the Oswego River as a source food as well as a travel artery, the Europeans saw the Oswego River as a strategic bottleneck. If you controlled Oswego and its river, you could control an inland empire and maybe the continent beyond. The environment was not a home to the Europeans so much as it was an opportunity for economic expansion and domination. The forests, water, and biodiversity could be converted to products to generate capital.

Ecology and economics are inextricably intertwined. Natural resources are converted to capital, and waste is returned to the environment that supplied the resources. As capital grows, the environment degrades. The river initially supported subsistence economies, but it would be transformed to support an extractive European economic system on a scale that would magnify through the centuries. The Oswego River became an expedient passage for the movement of capital as well as the colonists needed to produce it, and the soldiers needed to protect it. Over the next 375 years, the river's water quality, biota, and its channel would begin a process of transformation and "improvement" culminating in the modern river of 2022.

Transformation into the modern river began with incremental impacts associated with the quest to control the river between European colonial rivals. The Oswego River would be at the center of a geopolitical struggle between countries on the other side of the Atlantic that would last almost two centuries. Initially, the

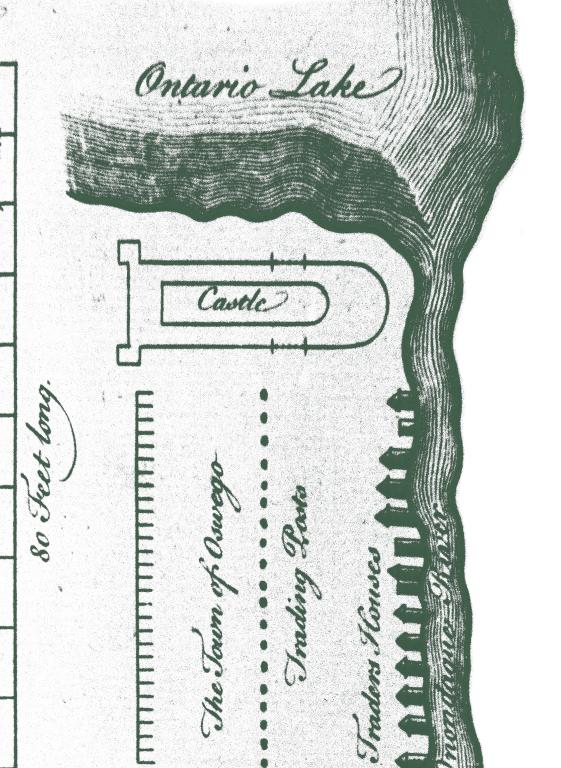


Collection of the OSWEGO MARITIME MUSEUM

Biological Regionalism: Oswego River, Fulton, Central New York, USA OILS ON WOOD PANEL 36in. x 48in.



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French controlled access to the Great Lakes via the St. Lawrence River. However, the English were encroaching into the Great Lakes watershed from the south with the help of their alliance with the Haudenosaunee. The Oswego River provided the ideal bypass around the French and the perfect access point to the natural wealth of the continent. In 1743, the legendary botanist John Bartram traveled to Oswego via the river as part of a botanical expedition in Pennsylvania and New York. Bartram was impressed by the swiftness of the river, its many rapids, and its falls at present day Fulton. During his stay at Oswego, he swam in Lake Ontario and botanized along the shoreline of river. Here, Bartram found the striking crimson beebalm (Monarda didyma) known as Oswego tea. Oswego tea was highly desireable for English gardens, but had been lost to European cultivation. Bartram collected seeds in present day Oswego that later flowered in cultivation in England in 1745.

Despite its notoriety to gardeners in Europe, Oswego tea would not build an empire's wealth. The first natural commodity of the region to be extracted and overexploited were furbearing animals such as beaver, fox, otter, muskrat, and racoon that were in high demand by

Trading Castle Plan, Circa 1743 Collection of the RICHARDSON-BATES HOUSE MUSEUM

beaver pelts made Oswego a crucial trading center that processing and eventual shipment. was bringing the French and English colonial powers the natural commerce of the region.

the Atlantic.

a noted shipbuilding port. Lumber would increase in

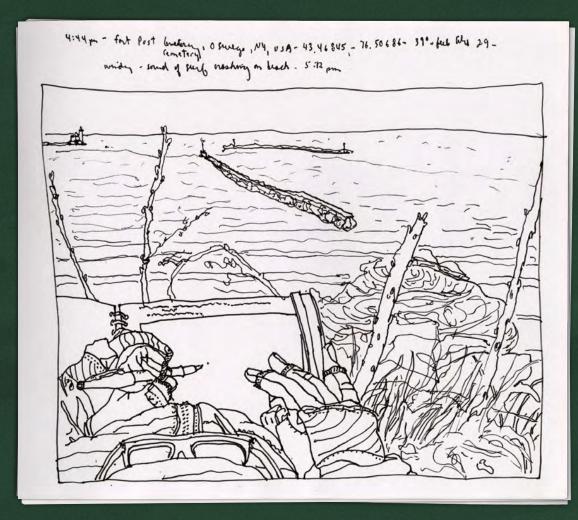
fashion conscious Europeans. For European colonists, from the 1840s to the 1920s. As preferred local the turn of the 20th century. The shoreline was cut, beaver pelts effectively became a currency to obtain trees were harvested, Oswego then became a major straightened, reinforced and made conveniently linear valuable European goods. By the 1700s, the wealth of port that received timber from the west that needed for the mills and other industry that used the river.

into military conflict. Within decades the outlet of the Canal (1825), the Oswego River and its communities and industrial buildings defined the mouth of the Oswego River became militarized to ensure control of were in danger of being by-passed. The canal's river. By the 1850s, the river provided the energy and relatively benign east-west channel made commercial water power that generated Oswego's greatest wealth. By the late 1700s, wars in Europe and in its transport quick and cost efficient. Although the Warehouses, lumber mills, tanneries, and mills for colonies had divided up North America. The British Oswego River could move products to the open waters corn starch and flour production replaced the shoreline controlled Canada and in 1796 ceded Oswego to of the Great Lakes in a shorter distance, its rapids habitat vital for salmon and birds. Eventually 20 flour the United States. The Americans turned to their and portages made it inconvenient and expensive. As mills would line the lower Oswego River, including the natural resources to build the economic foundation of Oswego had by-passed Montreal during the fur trade, largest one in the nation in 1870. their new nation. Due to its geographic importance, now Rochester and Buffalo were doing the same to Oswego was designated the first freshwater port of Oswego. In a matter of a few years, the Oswego Canal and Oswego Canal continued through the 1960s, entry to the United States and the first port west of Corporation was formed. The forest and biota of culminating in the canal system now known as the the river and its watershed had been used to fuel the New York State Barge Canal. The Oswego River, Oswego became an even greater commercial economy, and now the river itself would be physically once defined by dozens of rapids that made for a asset to a young nation looking to expand its economic "improved" for economic ambition. With the opening swift, challenging passage were flooded or bypassed, footprint westward. By the mid-1840s, the forests of the Oswego Canal in 1829, the domestication and sediments dredged, and locks excavated. Only a surrounding the river became ships as Oswego became industrialization of the Oswego River was underway. few places remained where one could imagine what

importance and become central to Oswego's economy led to Oswego's greatest era of prosperity through to repurposed for people and their economic ambitions.

The symmetric hook-shaped gravel bars that marked Meanwhile, with the opening of the Erie the entry to Lake Ontario were long gone. Wharves

Repeated modifications to the Erie Canal The improved Oswego River and Canal the river once was. The river had been pacified and



Oswego Reference Sketch, PEN ON ARCHIVAL PAPER, 10in. x 12in.



Biological Regionalism: Oswego River, Lake Ontario, Central New York, USA, OILS ON WOOD PANEL, 36in.x 48in.

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stressors were acknowledged to impact the Oswego one set of baselines for its narrow delineation, the on the south shore of Lake Ontario were functionally prevailing conditions above and below its watershed extinct. Shorelines of spawning rivers and streams position would inevitably influence the further were cleared, forest canopies removed. Salmon recovery of the river and harbor.

Following various remediation efforts, the Oswego Fisheries impairments to the river were a focus of the impeded migration. Overfishing dropped Atlantic Harbor and River AOC was officially delisted in AOC delisting process. The Oswego River was once salmon populations rapidly, but the constellation of 2006. According to the baselines of the AOC delisting a great Atlantic salmon river. The Haudenosaunee watershed alterations ensured the populations would process, the Oswego River and Harbor AOC was would gather at the Oswego Falls or other rapids not naturally recover. recovered. However, the impairments that existed in where they could spear Atlantic salmon as they leaped the upper reaches of the watershed and in adjacent into the cataracts. In 1742, Bartram noted that the Oswego River was essentially without salmon. What Lake Ontario were acknowledged to be beyond the Haudenosaunee caught "stout eels" in the Oswego salmon remained were further impacted by disease or purview of the AOC delisting process. Impairments River. During his time at Oswego Falls a "round and depredation from non-native species that had entered of ecosystem services continued to pinch the Oswego thick" fish over two feet long (presumably Atlantic the watershed through the increasingly connected River upstream and at its mouth. Positioned at the salmon) was caught. Similar fish were caught with Great Lakes basin. With the loss of Atlantic salmon bottom of the Great Lakes "stairway to the sea," Lake spears that were up to 20 feet long and tipped with and lake trout, the Great Lakes had lost their top Ontario is considered the most ecologically stressed metal points. In the early 1800s, during spawning predators. Forage fish, especially alewives, exploded Great Lake. Action across the Lake Ontario basin was season Atlantic salmon were clubbed, impaled with in abundance. When rafts of dead alewives began to acknowledged as necessary to further mitigate stresses pitchforks or seined with petticoats by Europeans. regularly wash up on Great Lakes shorelines, fisheries related to the Oswego AOC. Meanwhile, upstream The abundance of Atlantic salmon seemed unlimited. biologists were called to solve the problem. No native

> tributary streams warmed and became turbid with eroding sediments left behind after forests were cut. Wetland nursery habitat was filled and dams

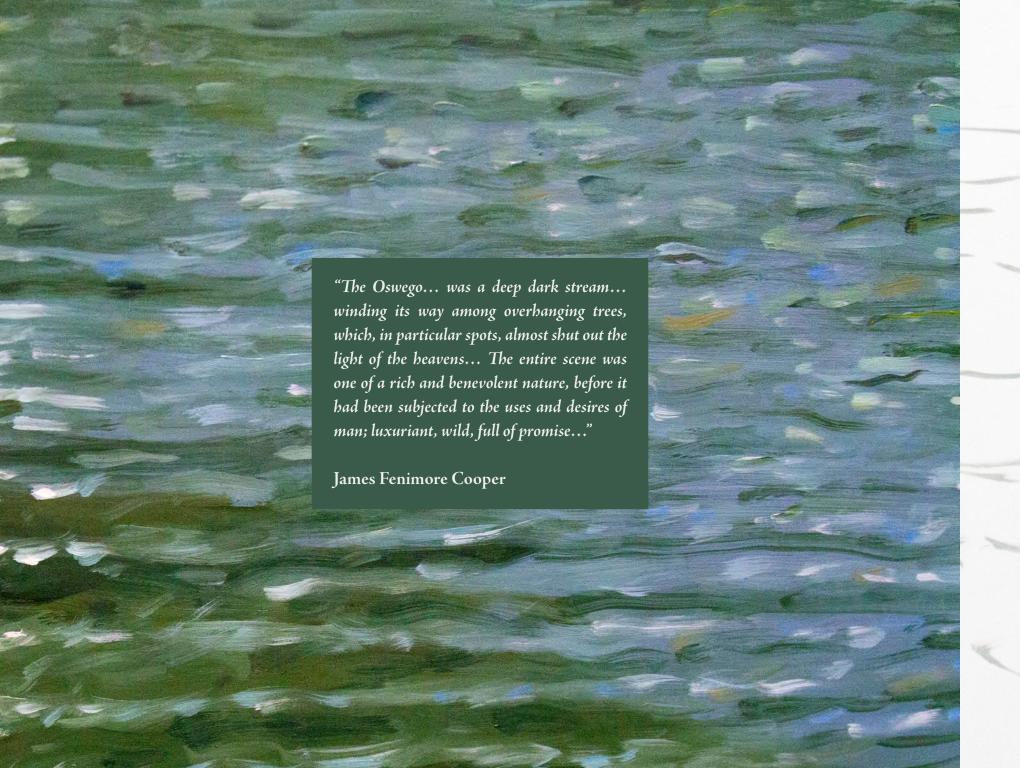
For the first half of the twentieth century the But only three decades later, salmon stocks top predators could be effectively substituted or reared AOC as well. There too, watershed level action was were collapsing. However, as the fish became scarce, in fisheries, so biologists turned to the Pacific Ocean. cited as necessary to reduce those stressors. Although the fishing effort intensified. By the 1890s, at the By the 1970s, Coho and Chinook salmon were the Oswego AOC was considered rehabilitated within height of Oswego's prosperity Atlantic salmon runs introduced from the Pacific Northwest. The hope



Diego Rey with a salmon caught from a Lake Ontario tributary. CIRCA 2013

for realigning the food web of Lake Ontario and its tributaries was placed on salmon that evolved on the other side of the continent. The bet paid off and the Pacific salmon rapidly adapted to their new home in the Lake Ontario watershed. Today, the Oswego River is again a celebrated salmon river, but for the "wrong" species of salmon. The baseline of the salmon fishery has shifted again.

The expedient choices of the past will remain evident to current and future generations that live along the river. The river carries a legacy of neglect that will take time to heal. Vigilance now and in the future is needed to maintain and improve upon what has been achieved. Sediments are still toxic. Even after the AOC delisting, sewage was still discharged into the river during storm events that overwhelmed wastewater infrastructure. The City of Oswego has improved their sewage treatment systems, but only after being cited by the Environmental Protection Agency. The native salmon fishery is gone. Fish still carry industrial toxins such as PCBs and dioxin as well as the pesticide mirex. Depending on the species, fish can only be sparingly eaten or should be completely avoided. These are not the characteristics of a fully rehabilitated harbor and river. Baselines for regulators may not match baselines for citizens or nature itself.



the Oswego River. In the past, improvement of the across the world. No watershed is an island. Oswego River meant changing the river for human enterprise. Moving forward, improvement of the river watershed's climatic baseline will continue to recalibrate will need to focus on restoration of what was sacrificed as a result of unabated human carbon relocation to enhance ecosystem services and climate resiliency. into the atmosphere via fossil fuel combustion. Just The recession of industrialization has given the river when we are recognizing the benefits of living next time to recover. Improvement in the future will be to a cleaner river with greater ecological function, centered around improving how people live with the ecological threats on a global scale are beginning to river. With wise choices combined with regulations emerge within the Oswego River watershed. The coal and enforcement, remaining contaminant threats can that was once shipped out of Oswego now haunts the be limited and the river will gain additional space to modern watershed. Under current carbon emissions, improve for the benefit of those that live in and along by 2100, annual temperatures in the Oswego River the river. A healthy, responsibly managed river will watershed will warm approximately 8°F. Under grow healthy communities where people will want to current carbon emissions, by 2100 the Oswego live and work.

make. However the future of the Oswego River and climate is another's disaster.

Water is the heritage of the communities along all rivers, will also depend on the choices people make

Moving forward, the Oswego River

River watershed will have average summer high Today, where the cacophony of industry temperatures (currently 79.5°F) that are equivalent once dominated the shoreline of the river, people to Hattiesburg, Mississippi today (90.7°F). While now walk along the river with their dogs. Fishermen some might celebrate such a change in temperature, cast their lines and sailboats moor in the harbor. In other parts of the world including America, will be summer, kayaks and paddleboards skim through the submerged, ablaze in perpetual fire seasons, ravaged harbor. In the winter, birdwatchers scan the roiling by drought, and will wither in nearly uninhabitable currents for sea ducks, as do bald eagles. The modern conditions. The average summer temperatures of Las river is becoming the focal attraction of people for Vegas will resemble present day Saudi Arabia, Phoenix aesthetic, recreational, and residential purposes. The (Arizona) will resemble present day Kuwait, and the future of the Oswego River will continue to depend on Middle East may become essentially uninhabitable. the people that live along the river and the choices they One person's whimsical enthusiasm for a warmer





Clay Reference Sketch, pen on archival paper, 8in. x 12in.



iological Regionalism: Oswego River, Clay, Central New York, USA, 01LS ON WOOD PANEL, 36in. x 48in.

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WHERE'S THE FIELD STATION?

Rice Creek Field Station: Cultural & Natural History

In 1957, Professor John A. Weeks arrived at SUNY Oswego and asked, "Where's the field station?" As a field biologist, John knew the value of offering students and faculty a dedicated site for hands-on learning and research. Almost ten years later, John's vision became a reality. The college acquired roughly 350 acres of agricultural land located a mile south of SUNY Oswego's main campus and began the process of building a facility and transitioning the landscape from farmland to forests, fields, and wetlands. The intention was to restore the ecological communities that would have occupied this land prior to European settlement. To this end, John designed and supervised the construction of an earthen dam and fish ladder in Rice Creek, which created Rice Pond and its surrounding wetlands. Most of the adjacent upland areas were allowed to naturally revegetate; in certain areas, pine and spruce plantations were installed to assist in the process of reforestation.

The field station officially opened in 1966 and began serving SUNY Oswego and the surrounding community as a hub for college instruction, research, and public education related to the natural sciences—a threefold mission that persists to this day. In 1986, a group of community members and college faculty formed Rice Creek Associates (RCA), the support group for the field station, which raises funds through memberships and donations to support programs like the Rice Creek Reflections speaker series, the Small Grants Program that supports research and scholarly projects (over 100 to date), the Ruth Sachidanandan Herb Garden, trail improvement projects, and scholarships for Rice Creek's Exploring Nature children's camp. With RCA's support, each year the field station currently offers over 75 public nature programs, funds 3+ research and scholarly projects, and maintains 5 miles of trails. Regular public program offerings include guided nature walks, canoeing/kayaking on the pond, sustainable art workshops, wildlife viewing, and a children's story hour.





In 2013, the original field station facility was replaced with a new LEED Gold main building as well as an astronomical observatory and wired pavilion on the grounds. The opening of the new facility has invigorated the field station by expanding the ways Rice Creek can serve the SUNY Oswego campus and surrounding community. With ample classroom and laboratory space and updated equipment, Rice Creek currently hosts 14+ SUNY Oswego classes each year, primarily field courses in biology and zoology. The field station also serves as a retreat center for campus departments, offers a focal point for nature-based wellness events on campus, and creates a peaceful place for recreation and reflection for the SUNY Oswego community and the public alike.

Although the Rice Creek Field Station property was chosen primarily for its proximity to the main campus, the location is significant in several ways. From a geosciences perspective, Rice Creek and Rice Pond sit at the low point between two drumlins—elongated mounds left behind by glaciers—within one of the largest drumlin fields on Earth, offering natural research opportunities for SUNY Oswego geology faculty and students. From a biological sciences perspective, one of the most significant aspects of Rice Creek Field Station's location is its importance to migrating birds. The near-shore areas of Lake Ontario are a critical migration route for millions of birds each year. Songbirds pile up near the lake, fueling up and waiting for favorable conditions before or after crossing the lake at night. Raptors hug the shoreline, using updrafts and thermals to migrate with far less effort. All of these birds require safe places to rest and refuel during their energy-intensive journey, and natural habitats like Rice Creek fill a critical role.

Today, the traces of Rice Creek Field Station's cultural history are harder to read on the landscape. Rice Pond and its surrounding wetlands have matured and support an abundance of plant and animal life: beavers, osprey, muskrats, snapping turtles, cattails, pickerel weed, green frogs, damselflies, and more. Dense young forests have succeeded the open areas, sheltering ruffed grouse, white-tailed deer, and fishers. All told, Rice Creek is home to 718 species of plants, 218 species of animals, 61 species of fungi, over 60 species of butterflies (and counting). Yet a careful observer can still see signs of the past in the stone walls lining what used to be farm fields, in the occasional plantation of non-native spruce, in the areas of open fields maintained by rotational mowing, and in the encroaching invasive multiflora rose that used to serve as a natural field boundary for livestock. Rice Creek Field Station and its mosaic of habitats—some more "natural," like the older-growth woodlot, and some more human-influenced—remind us that landscapes rich in biodiversity and ecological function come not only from land "untouched" by humans (if such a place indeed exists): they can also be found in reclaimed landscapes and "novel ecosystems."



CANAL FOREST RESTORATION PROJECT

1800s rocketed New York State to its preeminent lightweight wood was also used to frame houses. economic and political position in the young United Today, these species are far less common in the States, opening an efficient trade route from the port upstate New York landscape than they were several of New York City to the Midwest. Just as "Clinton's hundred years ago. White oaks in particular remain ditch"—along with its several off-shoot canals—left a exceedingly rare, and the lack of seed-producing trees lasting economic legacy in New York State, so too the makes natural revegetation impossible in many areas. canals forever changed the natural landscape of the The absence of these trees is a loss both ecologically upstate region. Large forested wetlands were drained and culturally. Mature white pine trees are the favored during canal construction. The forest clearing begun nesting tree for Bald Eagles, while white oaks produce by European-American settlers in the 1700s and early acorns lower in tannins, and therefore more nutritious 1800s accelerated along the canal corridor as villages, for wildlife, than red oaks. Countless other organisms towns, and cities swelled in size. And large, old-growth depend on these trees for habitat. Culturally, both trees were felled to supply boats, barrels, locks, and white oaks and white pines were also important to docks along the canals.

hit: trees in the white oak group (white oak [Quercus a source of food, while white pine trees provided not alba], swamp white oak [Quercus bicolor], burr oak only a tea rich in vitamin C, but also were considered [Quercus macrocarpa]), being strong and water- the "Tree of Peace." According to legend, the five resistant, were favored for boats and barrels. White Haudenosaunee nations came together in a treaty pines (Pinus strobus) with their tall, straight trunks of peace under the spreading branches of a white

The construction of the Erie Canal in the early interior boat components, and their soft, strong, and the indigenous communities of upstate New York: A few tree species in particular were hard the Haudenosaunee peoples. White oak acorns were were felled to create masts on canal schooners and pine tree, whose needles grouped in bundles of five





symbolized the peaceful confederacy they had formed.

Inspired to action by the legacy of these tree species, George and Jane Pauk, who call the Erie Canal home during summers, founded in 2017 the Canal Forest Restoration Project (CFRP): a grassroots effort to restore white oaks and white pines to New York State's canal regions. The Pauks began collecting seeds and propagating these trees and giving them away for free all along the Erie and Oswego Canals. They acquired additional trees from the New York State nursery and enlisted the help of a nursery in Newark, New York to house their trees. In 2019, the Newark nursery closed, and the Pauks went looking for a new, permanent home for the project. They found a willing partner in Dr. Kamal Mohamed, the director of Rice Creek Field Station, a property located just miles away from the Oswego Canal. Since then, the Rice Creek Field Station staff has taken the lead in coordinating this conservation project: from seed collection, to tree distribution, to public education. The project still provides free trees to the public and offers educational opportunities including their annual Arbor Day webinar series.

Since 2017, the project has given away hundreds of trees, from Albany to Buffalo, and the Finger Lakes to the north country. To learn more about the project and how to support the CFRP, please visit www.oswego. edu/rice-creek/canal-forest-restoration-project.

THE CFRP'S CURRENT PROJECT GOALS LOOK TO THE PAST AND THE FUTURE:

- 1 Replenish the upstate New York region 3 Collect seeds, produce seedlings for with a future of white oak and white pine plantings, and engage the support and trees of ecological proportion and cultural collaboration of individuals and organizations significance.
- and visitors of New York's canal region.
- in the canal region.
- 2 Foster strong awareness and appreciation 4 Foster a new generation of long-lived tree of the unique characteristics and value of species that will store carbon and mitigate the white oaks and white pines among residents effects of climate change, ensuring a brighter future for New York State and the planet.

Photo taken at the RICE CREEK FIELD STATION



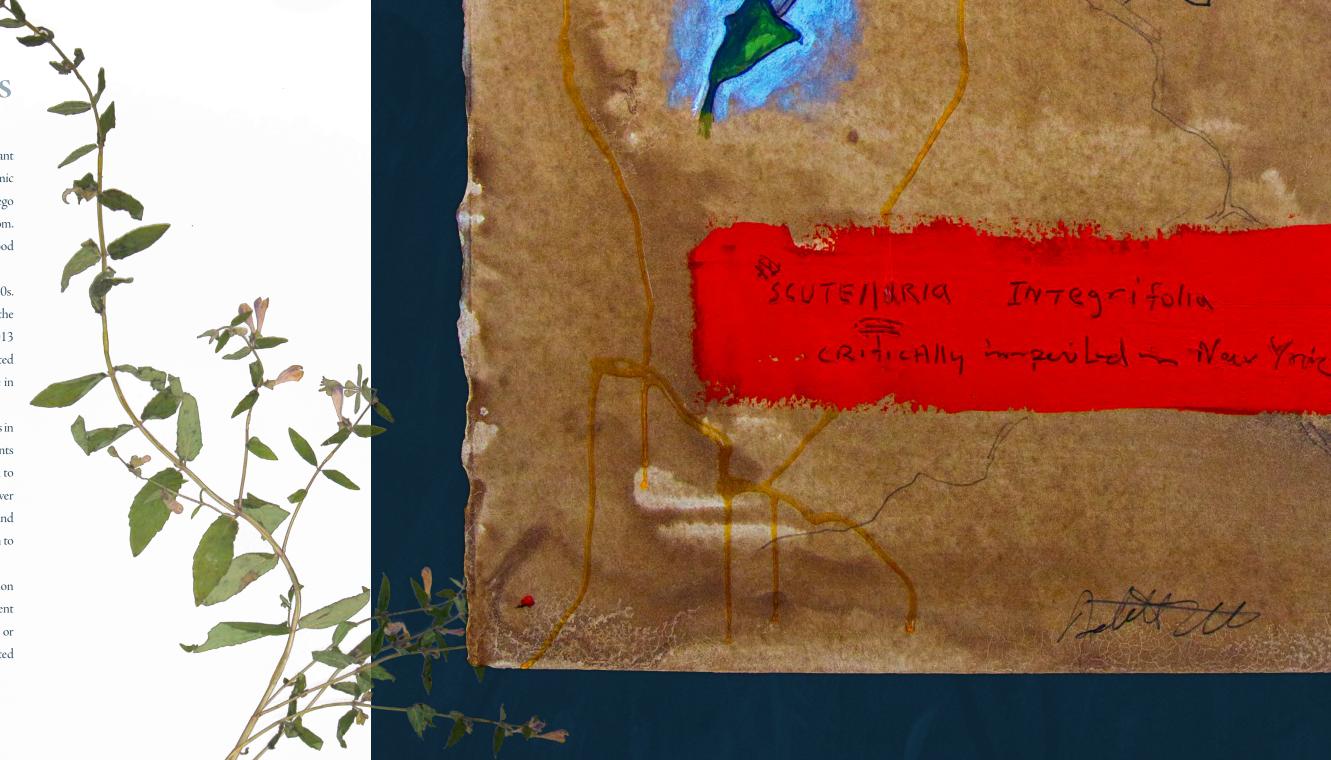
Endangered & Threatened Plants in the Herbarium at State University of New York at Oswego

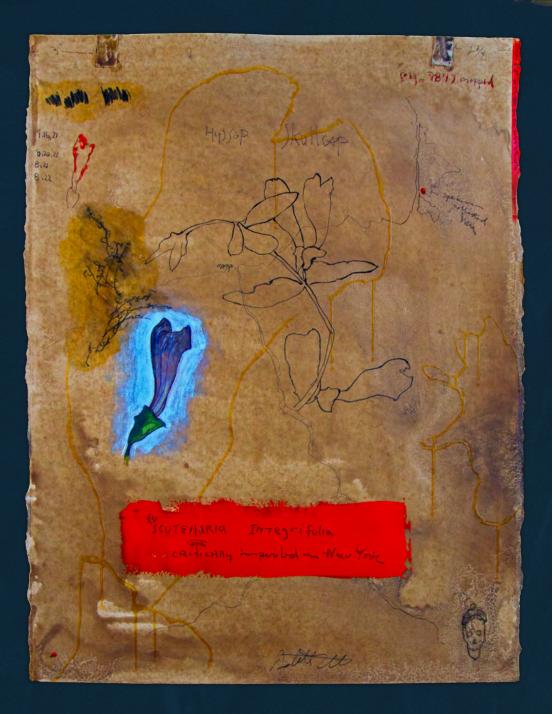
The SUNY Oswego Herbarium is literally the plants museum. It houses a collection of dried and pressed plant specimens. In the herbarium and for easy access, specimens are arranged according to plants' higher taxonomic categories, within each category they are arranged alphabetically by family, genus, and species. SUNY Oswego herbarium (OSW) has an estimated 50,000 specimens providing a good representation of the plant kingdom. These specimens were collected from a wide geographical range within the United States and with a good international representation.

OSW is composed of salvaged collections transferred from Syracuse University in the mid 1970s. This collection of 35,000 specimens sat in boxes, inaccessible to researchers and suffering damage in the basement of the original science building, until the construction of a new science building at Oswego in 2013 provided a dedicated space for the herbarium. In that year a small group led by an emeritus professor started sorting, curating/repairing, cataloguing, and digitizing the collection. Now the herbarium is open for use in teaching and research though the work on databasing and digitization is still in progress.

Students use the Herbarium to study plant biology and systematics. The herbarium helps students in keying unknown plants thus aiding them in plant identification. From plant records in the Herbarium students and researchers learn more about plants geographic distribution. Our herbarium holds plants dating back to the early 1880s. These older specimens are very helpful in providing a record of change in vegetation over time. Herbaria serve as references for name changes and they are key in writing of field guides, manuals and floras. As well, herbaria hold voucher specimens which are representative samples of plants used in research to authenticate the sources of data, chromosome counts, and molecular data.

According to NY Department of State, "The endangered native plants are in danger of extirpation throughout all or a significant portion of their ranges within the State and requiring remedial action to prevent such extinction. Listed plants are those with five or fewer extant sites, or fewer than 1,000 individuals, or restricted to fewer than four U.S.G.S. 7½ minute series maps, or species listed as endangered by the United States Department of Interior in the Code of Federal Regulations".





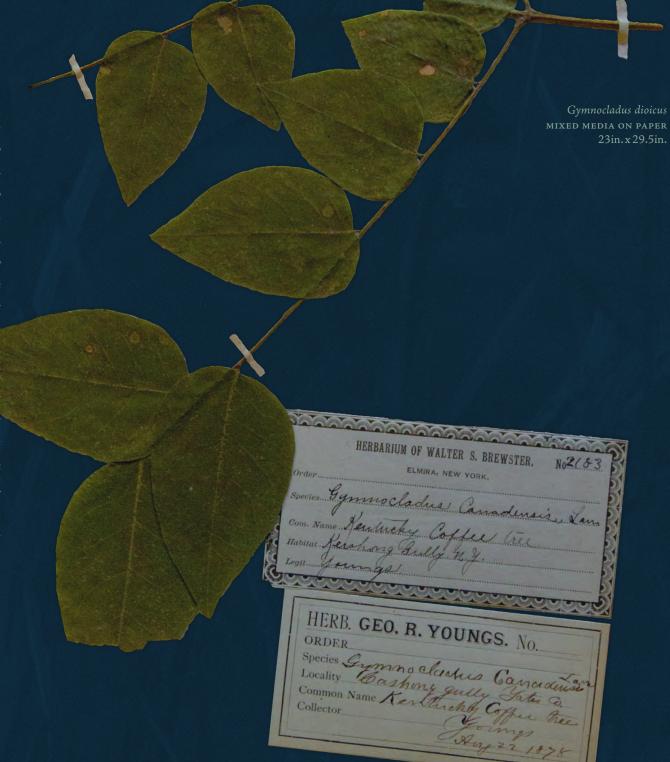
Scutellaria Integrifolia MIXED MEDIA ON PAPER 23in. x 29.5in. **Scutellaria integrifolia** (Lamiaceae, Mint Family). Known by many local names including hyssop skullcap and helmet skullcap. This plant is native to Eastern and S.E. United States. Its range extends west to Texas and inland to southern Ohio, Missouri, and Kentucky. However it does not do well at its northern and western limits. It is generally found in low nutrient meadows and fields, often in wetlands and adjacent fields.

In some of its range hyssop skullcap is known to be fire dependent or at least needs some disturbance to maintain its population. Like many in its family, this plant may be able to clone itself but it is unlikely to establish a persistent seed bank, and growth can be limited by light availability. However most threat to this species came from habitat changes and deforestation at the turn of the last century, which affected the ideal habitat for this species and favored its competitors. Development and changes in land use may have destroyed populations or altered habitats. As this species favored wetlands, filling and draining of wetlands may have changed the ecotone (transition zones between habitats) areas into a more drier ecosystems. Additionally, lowland habitats may have increasingly received run-off containing fertilizers, which favored their competitors. As well, Agriculture may have displaced this species. Particularly in New York, most historical populations were destroyed by development. It has been cited that human activity remains the main threat because most populations of hyssop skullcap live in man-made habitats in New York.

Many species in the genus Scutellaria have been used in traditional Native American medical systems as a strong emmenagogue to stimulate menstrual flow. Although most of the medical studies focused on the skullcap (Scutellaria lateriflora) but other species, including hyssop skullcap serves the same purpose. One reason could be that this species is used because its more available than the other species. The dried shoot of skullcap has been traditionally used as a sedative and to treat various nervous disorders such as anxiety, and as antispasmodic (relieve spasm of involuntary muscle) to treat epilepsy. The Cherokee used helmet skullcap in much the same way as the original skullcap as a nervine tonic and to calm the pain of menstrual cramps. It is sold as a tea, capsule or a tonic to ease anxiety and tension.

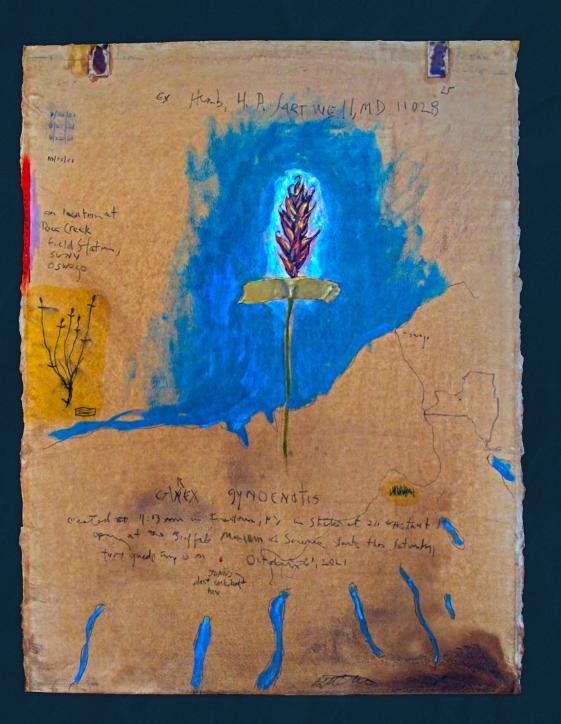
Gymnocladus dioicus (Fabaceae, Beans Family). This species is known as Kentucky coffee tree. The name came from the fact that Native Americans of the Great Lakes region used to roast the beans and utilized them as coffee substitute when coffee was expensive and hard to find at the time. Once real coffee became available, the Native dropped its use for coffee. This tree may have been brought into NY by Native American where it became naturalized. Beside coffee, Native Americans in the Great Lakes region used the large beans (up to 10 inches) for food, making bowls, and dice for games. Because the beans and pod are poisonous, they must be roasted for three hours before they can be safe to eat. The beans were known to have cytisine, a partial agonist of nicotine acetylcholine receptors which could can be harmful or even fatal if the beans were consumed raw. Earlier Native Americans in the Great Lakes region used the plant for medicine. For example. The Omaha used the root bark in hemorrhage, from the nose and during childbirth. The root powder mixed with water was administered to women during protracted labor.

Seed production in Kentucky coffee tree is unusual and can be explained by its unusual physiology. There is strong evidence that the tree produces relatively smaller crop of seeds each year compared to trees like oaks and beeches. This is in part due to the fact that only food made by the leaves on the fruiting branch directly support fruit development. This means the fruit development is unlikely to be based on stored resources rather on food drawn directly from the leaves. Additionally, the seeds have hard outer shells making it difficult for the seeds to germinate naturally. Seeds do not disperse farther from the parent tree since Squirrels do not cache them. Seed dispersal exclusively depends on flowing water. Today the distribution of Kentucky coffee tree coincide with former Native American settlement reflecting the importance of culture in shaping the current range of this species. Overharvesting of the trees was also cited as a reason for rarity of the trees.





Carex Gynocrates
MIXED MEDIA ON PAPER
23in. x 29.5in.



Carex gynocrates

(Cyperaceae, Sedge Family). It is known as the Northern bog sedge. The epithet "gynocrates" means the dominant female due to the thick terminal spikes. This is another species with a specific habitat requirements. In New York State, it is confined to openings, rich swamps, and swamps neighboring fens. Within these habitats, it is usually confined to the edges and tops of hummocks, often in association with conifer swamps particularly northern white cedar.

The main threat to this species stems from alterations to its habitat hydrology and water chemistry. Invasive species can also constitute a potential threat to the Northern bog sedge. There are no known uses for this species.



Arethusa bulbosa (Orchidaceae, the Orchid Family). Arethusa is named after a beautiful Greek nymph, for its beauty flowers. No wonder it has been described by some as an orchid with the most beautiful flower in the Flora of North America. The specific epithet bulbosa is the Latin meaning "bulb" referring to is roots. This orchid is known by the common name dragon's mouth. Its a monotypic genus (only one species in this genus. In New York State, it is found in counties of central and upper New York and the western counties along the Atlantic. Within these counties its common in peat bogs and fens sometimes with healthy but localized populations.

Very little is known about its medicinal value. In some parts of North America, Folk remedy used the roots of Arethusa bulbosa to relieve toothache and in cataplasms for tumors. Because of its beautiful red flowers, this species is known to attract bumblebees. The dragon's mouth flowers produce very little nectar as a reward and experienced bees tend to avoid it. This means pollination when it occurs is done by unexperienced emerging bees, a factor that may reduce pollination success in this species.

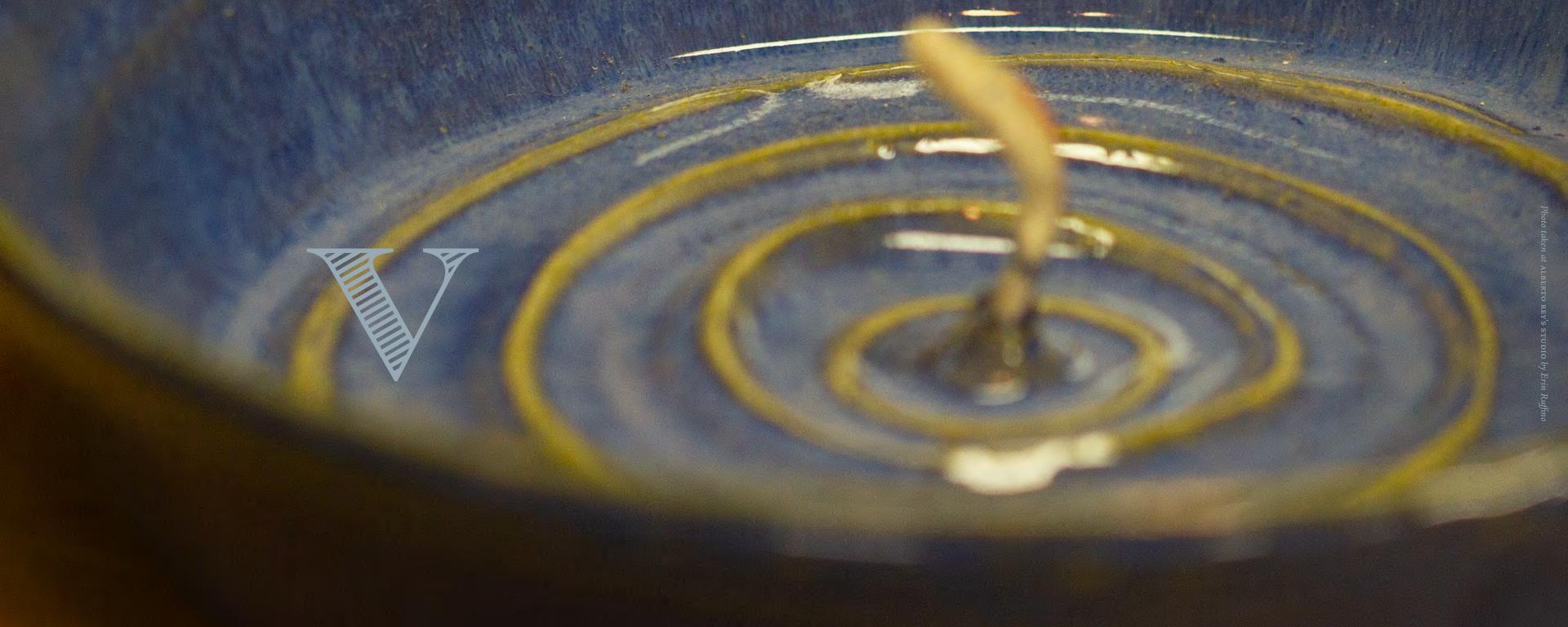
Dragon's Mouth showed a steady decline overtime and only few populations restricted to bogs and fens are known today. Populations in the Adirondacks and central New York have been relatively stable with three collection records in our herbarium.

In our area, populations are protected in isolated bogs and fens away from residential areas but other sites may be threatened by development including habitats loss or hydrologic changes that may affect wetlands. Management strategies include reducing shrub cover to maintain an open canopy. Limiting of human visitations as a precaution to limit illegal collection and spread of invasive species were found to be helpful. Also establishing of buffer zones around known populations will protect them from expansion of developments.

Arethusa Bulbosa MIXED MEDIA ON PAPER 23in.x29.5in.









About the Artist

Alberto Rey has developed an affinity toward moving water since the day he was born on the coast of Cuba in 1960. Over the decades, his work has investigated a wide range of topics related to his immigration to the United States and to the issues related to new environment.

Alberto's paintings and videos can be found in over twenty museum collections and have been in around 200 exhibitions. In addition to being an artist, Alberto is a fly fishing guide, the founder and director of a youth fly fishing program and a distinguished professor at the State University of New York at Fredonia.

Other books published by Alberto in conjunction with art projects:

outlook of the river and nearby community.

Life Streams: Alberto Rey's Cuban and Lost Beauty II: The Art of Museum Stories Scajaquada Creek in Buffalo, NY.

Extinct Birds Project The project investigates the cause for the extinction of seventeen bird species, the lives of the collector's, methods used for collecting these species and the politics and economics of classifying species as endangered or extinct.

Complexities of Water: Biological Regionalism: Lost Beauty: Icebergs The book investigates the Bagmati River, Kathmandu Valley, Nepal The project history, the process of creating the paintings, work investigated the cultural importance of the river, the designer's thought process in the layout of the the causes of its pollution, the challenges and future publication and the dramatic effects of climate change on the Breiðamerkurjökull glacier and the world.

American Art This publication examines Alberto's Alberto selected fifteen very small but culturally or life and his investigation into the long history of the scientifically important items from the 750,000 items from the Buffalo Museum of Science.









