Mason Farm Biological Reserve: Yesterday, Today, and Tomorrow

Johnny Randall
Director of Conservation Programs
A Brief History

- 12,000 BP to 1730 AD - Native American occupants and later settlements throughout the Morgan Creek Valley
- 1741 - Mark Morgan establishes first European farm in Orange County
- 1792 - Mary Elizabeth Morgan Mason wills 800 acres to the University
- 1792-1935 – the land leased to local Orange County farmers
- 1935-1953 – Soil Conservation Service plant testing nursery starts
- 1940s – Al Radford, Laurie Stewart (Radford) and others start native shrub garden and research projects at Mason Farm
- 1965 – Ritchie Bell has Botany Pond constructed and uses ca. 80 acres for botanical research
- 1971 – University Trustees set aside 195 additional acres for botanical research
- 1984 – Mason Farm Biological Reserve established by UNC Trustees thanks to Haven Wiley proposal, unifying 367 acres
- 1984-present – MFBR used by many academic units AND available for the quiet enjoyment of nature by the general public
Ice Age relict rhododendron bluffs along Morgan Creek
Anemone berlandieri - Southern anemone
John Lawson, 1709, *A New Voyage to Carolina*
Shakori style village of the Morgan Creek Valley (c. 1670-1690)
Late Paleo-Indian Spearpoints from Hardaway

- **Hardaway Side-Notched** (8000 BC)
- **Hardaway-Dalton** (8,500 BC)
- **Hardaway Blade** (9,000 BC)

From Mason Farm
Typical foods of Native American groups of Orange Co. based on subsistence remains from Haw River Phase - UNC Laboratories of Archaeology

Plants
- maize
- beans
- squash
- chenopodium
- maygrass
- little barley
- sunflower
- hickory nuts
- walnuts
- acorns
- persimmon

Animals
- white-tailed deer
- black bear
- raccoon
- skunk
- weasel
- squirrel
- rabbit
- turtle
- catfish
- sunfish
- gar
Conical Woodland Cooking Pots from Stanly County (left) and Finley Golf Course, UNC (right)
Lower Trading Path approximation along Morgan Creek
DeLisle, 1718 (in Cumming, 1962)
“There are many spacious tracts of meadow-land...burdened with grass six feet high.”

“The buffaloes ranged in droves feeding upon the open savannas morning and night.”

Mark Catesby, 1763

“In February and March the inhabitants have a custom of burning the woods...an annual custom of the Indians in their huntings, of setting the woods on fire many miles in extent.”

John Lawson, 1709

A New Voyage to Carolina
Pickard Mill - 5
The Pickard Mill is at the base of Pickard Mountain. The Pickard Mill was in operation in 1880 and is mentioned in the Manufacturing Census for that year.

The site is the subject of a conservation easement owned by the Triangle Land Conservancy:

Lloyd Mill - 4
This mill was located about 1/2 mile north of where NC 54 highway crosses Morgan Creek just west of Carrboro. The last remnants of the former mill dam are still standing and the abandoned mill race is definitely discernible along the west bank.
Morgan Creek at Pickard's Mill dam

William Burlingame
Morgan and Mason Family Cemetery
Solomon Morgan’s headstone and the fieldstone of an unnamed slave who both occupy the Morgan/Mason family cemetery
Archaeological Site Analysis
Mason Farm Biological Reserve and surrounding lands - 25 October, 1940
“I first saw the Mason Farm of the University of North Carolina at Chapel Hill in February 1961. Crossing Morgan Creek over a concrete dam, I walked under the winter sun on a road that led over a grass-grown levee, built to hold back the spring floods. I had no thought of what might lie beyond. When I reached the top of the dike, I gasped. For two miles straightaway, and from east to west, windswept fields and woods lay under an enormous vault of blue.”
Mason Farm 1957 and Soil Conservation Service use
CHAPTER III

How a Vulture Finds Its Prey
North Carolina Botanical Garden and other State-Owned Properties

- Mason Farm Biological Reserve * – 367
- Parker Preserve - 118
- Hunt Arboretum – 124
- Gray bluff Garden- 8
- Piedmont Nature Trails – 50
- Coker Pinetum – 26
- Battle Park – 93

  • Total = 786

Botanical Garden Foundation Properties

- Stillhouse Bottom Nature Preserve* – 23 acres
- Laurel Hill Nature Preserve* – 75 acres
- Laurel Hill Residence and Grounds – 2
- Highland Pond (Chatham Co.) – 3
- Creekside Bluff (Orange Co.) – 1
- Gordon Butler Nature Preserve (Cumberland Co.) – 12
- Villa Pinea – 12

  • Total = 128

Botanical Garden Foundation Conservation Easements

- Morgan Creek Easements (12 parcels) – 6 acres
- Laurel Hill Easements – 12
- Stillhouse Bottom – 5
- Villa Pinea – 12
- Morgan Creek Preserve – 92

  • Total = 127

Botanical Garden Foundation Managed Lands

- Penny’s Bend Nature Preserve * - 84 acres

  * Outstanding rating according to NCNHP (2013)

Total = 1,125 acres
Crossing the ford (or not)
Mason Farm Biological Reserve

- MFBR proper is 367 acres (ca. 500 with Parker)
- 500-acres of adjacent undeveloped private land
- 41,000-acre New Hope Gamelands to the south
- 800 species of plants
- 216 species of birds
- 29 species of mammals
- 28 species of fish
- 28 species of reptiles
- 23 species of amphibians
- 67 species of butterflies
MFBR Management Plan: fundamental guidelines

- Allow and encourage the function of natural processes to the greatest extent possible
- Rehabilitate sites of impaired ecological function
- Actively manage areas that can benefit from human intervention
- Maintain habitat diversity primarily by retaining a mix of natural woodlands and early successional habitats
Forests of Continuity — P.S. White
Big Oak Woods and Southern Shagbark Hickory Slope
Q: How is the Mason Farm Biological Reserve funded?

A: Grants and contracts for specific projects; BGF Mason Farm Account (expendable); and BGF Mason Farm Endowment (payout)
All bird photos taken at Mason Farm by Mary Sonis unless otherwise noted
What species is Woody Woodpecker?
Yellow-billed Cuckoo
Coccyzus americanus

LEGEND
- Year Round
- Summer (breeding)
- Winter (non-breeding)
- Migration

Map by Cornell Lab of Ornithology
Range data by NatureServe
ADDITIONAL DRIVERS OF BIRD DECLINES

Habitat loss is by far the greatest cause of bird population declines. Humans also kill billions of birds in the U.S. annually through more direct actions, such as allowing outdoor cats to prey upon birds. Canadian bird mortality estimates show remarkably similar patterns. Data-driven assessments of how different human-caused sources of bird mortality contribute to population declines are essential for developing strategic conservation objectives and science-based policies.

Reducing or eliminating direct sources of mortality could save millions, if not billions, of birds annually. The best ways to reduce bird mortality include:

- **CATS**: Keeping pet cats indoors and implementing policies to eliminate feral cat colonies.
- **COLLISIONS**: Following bird-friendly window practices, reducing night lighting in and on tall buildings, warning auto drivers in high-collision areas, installing flashing rather than steady-burning lights on communication towers, and locating wind turbines away from areas of high bird concentrations (especially areas that pose threats to particular species such as eagles).
- **CHEMICALS**: Limiting the broadcast spraying of pesticides and insecticides and introducing integrated pest management practices (which reduce or eliminate chemical applications) in agricultural areas.

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**Bar chart based on independent assessments of direct human-caused mortality in the United States and Canada. This data is adapted from LoGi SR, Will U, Mabla PT: Direct human-caused mortality of birds. Annual Review of Ecology, Evolution, and Systematics In prep.**
Walker Duling Eagle Scout wildlife habitat project and great horned owl nest box installation donation by Modern Tree Service
The once and future Piedmont Savanna
Seed collection, processing, and storage
Seed collecting with NC Wildlife Resources Commission harvester through the US Fish and Wildlife Service
Seed desiccation room and vacuum sealer all supported by USFWS grants
Scats of Mason Farm
Presettlement fire frequency

[Map of presettlement fire frequency regions of the United States]

Vegetation that is topographically elevated and relatively less moist is supported by fire. In the context of our climate, successions such as from native grassland to woodland and from deciduous to coniferous forests are greatly influenced by fire. Patches of exposed soil surface from succession are colonized by lichens, sedges, and other early colonizers. The successional stage that results can be from 1-3 to 100 or more years. After about 100 years, old field, barrens, and stands of the prairie stage may have a very different appearance from the original savannah stage.
The *real* Smokey Bear
Fire management at Mason Farm
Prescribed fire – Mason Farm Biological Reserve - 19 March, 2010
New tractor and bush hog!
Holiday Parade
Simple habitat creation
Bobwhite quail reintroduction - 2012
Bobwhite release of approximately 100 birds in two separate locations after 5 weeks

24 September
AKA: timberdoodle, bogsucker, night partridge, brush snipe, hokumpoke, and becasse
Rusty Blackbird numbers have plummeted a staggering 85-95% since the mid-1900’s (Greenberg and Droege, 1999).
How do we get the work done?
Green Dragon volunteers and Conservation Interns
Fescue field conversion to native plant meadow - 2008 Honors Thesis – JC Poythress
- spray fescue with herbicide during winter
- burn field in spring
- plow and level
- selectively spray Lespedeza
- plant both plugs and seeds
- voila!
From roadside to biological reserve

Principal Components Analysis, with biplot vectors and roadside plot position from environmental data
Leatherwood (*Dirca palustris*) matched habitat translocation from Kit Creek (detention basin) to Mason Farm Biological Reserve.
Berm perforation and floodplain restoration at the Mason Farm Biological Reserve by NC Ecosystem Enhancement Program
Mason Farm Biological Reserve berm perforation and floodplain restoration project
Mason Farm Biological Reserve berm openings after 6” rain – 27 May, 2011
“The Parker Property is valuable to the community in so many ways,” said the chancellor. “Under the Botanical Garden’s management, the land will be preserved in its undeveloped state, yet remain accessible to researchers, students and others with an interest in what it has to teach us.”

Chancellor Holden Thorp
Lone Field
1955 vs 2016
Restoring the wetland by building a boardwalk
The monarch, the milkweed, and the goldenrod...
Island Biogeography Theory & Design

- Large is better than small
- Undivided is better than divided
- If divided, close is better than far
- If divided, distances should be equal
- Corridors are better than no corridors
- Circular is better than narrow (low perimeter to area ratio)
Regional Macrosites

Mason Farm
Lands Managed by the North Carolina Botanical Garden

Property Ownership:
- Botanical Garden Foundation, Inc.
- RFF, Inc.: Conservation Easement
- State of North Carolina
- UNC-Chapel Hill

Legend:
- Creek
- Pond
- Trail
- Street
- UNC-Chapel Hill Building

North Carolina Botanical Garden and New Hope Gamelands

Mary Sonis
NCBG

Mason Farm Biological Reserve
Corridors, connectivity, and conserving biological diversity