



North Carolina Department of Cultural Resources  
State Historic Preservation Office

Ramona M. Bartos, Administrator

Governor Pat McCrory  
Secretary Susan Kluttz

Office of Archives and History  
Deputy Secretary Kevin Cherry

April 7, 2014

Lynn L. Hicks  
US Forest Service  
160 Zillicoa Street, Suite A  
Asheville, NC 28801-10082

MA0719

RE: Historic Structure Documentation and Assessment of the Houston Dam,  
Nantahala Ranger District, Nantahala National Forest, Macon County, CH 14-0031

Dear Mr. Hicks:

Thank you for your letter of March 20, 2014, transmitting the above-referenced assessment. We have reviewed the report and the proposed removal of the Houston Dam. We concur with the Forest Service's assessment that the dam is not historic and its removal will not affect any historic properties.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, contact Renee Gledhill-Earley, environmental review coordinator, at 919-807-6579 or [renee.gledhill-earley@ncdcr.gov](mailto:renee.gledhill-earley@ncdcr.gov). In all future communication concerning this project, please cite the above referenced tracking number.

Sincerely,

*Renee Gledhill-Earley*

for Ramona M. Bartos



United States  
Department of  
Agriculture

Forest  
Service

National Forests in North Carolina  
Supervisor's Office

160 ZILLICOA ST STE A  
ASHEVILLE NC 28801-1082  
828-257-4200

**File Code:** 2360-3 / 1500

**Date:** March 20, 2014



Ms. Ramona Bartos  
SHPO Administrator  
Div. of Archives & History  
4619 Mail Services Center  
Raleigh, NC 27699-4619

CH 14-0031

A- (NO)  
on structure -  
LGH/lff  
3-26-14

PRB 4/1/14  
2 copies  
OSH  
2 HPD  
ER Letters

Dear Ms. Bartos:

Enclosed for your review and comment is the report *Historic Structure Documentation and Assessment of the Houston Dam, Nantahala Ranger District, Nantahala National Forest, Macon County, North Carolina.*

Sincerely,

Duc 4/15/14

LYNN L. HICKS  
Engineering, Heritage Resources and  
Recreation Staff Officer

cc: Nantahala Ranger District  
Nantahala Zone Archaeologist  
Nantahala NEPA Planner

Enclosures: 4

MAR 25 2014



**Historic Structure Documentation and Assessment of the Houston Dam  
Nantahala Ranger District, Nantahala National Forest,  
Macon County, North Carolina**

National Forests in North Carolina  
Asheville, North Carolina



Andrew M. Triplett  
March 2014

Distribution:  
Supervisor's Office  
Ranger District  
NC SHPO  
EBCI THPO  
Other

MAR 25 2014



## MANAGEMENT SUMMARY

---

In compliance with Federal laws and regulations, Sections 106 and 110 of the National Historic Preservation Act of 1966, as amended, (NHPA) and the Programmatic Memorandum of Agreement (PMOA) with the State Historic Preservation Officer (SHPO), documentation and assessment was completed for the historic Houston Dam on the Nantahala Ranger District of the Nantahala National Forest in Highlands, Macon County, North Carolina. It is proposed to remove the dam because of structural integrity concerns that have made this a high hazard dam responsibility for the U.S. Forest Service.

Given it is not unique, and in a very deteriorated state of condition, it has been determined that the Houston Dam is *not eligible* for listing in the National Register of Historic Places (NRHP [36CFR60.4]). ***The proposed removal of the dam will have no effect on a NRHP eligible property.*** A copy of this report will be sent to the SHPO for review and comment.

*Andrew M. Triplett*

ANDREW M. TRIPLETT  
Nantahala National Forest, Zone Archaeologist



## INTRODUCTION

The Houston dam at Highlands Reservoir is located approximately one mile north of Highlands, North Carolina, along State Highway 1538 ( Plate 1 and Figure 1). The Forest Service proposes to remove the earthen dam structure, and at a later date, restore natural drainage patterns in order to eliminate a high hazard dam responsibility. The first part of the project consists solely of the documentation of the earthen dam. The second part of the project, the removal of the dam and subsequent stream restoration, will take place once funding has been secured for the project, possibly sometime in FY 2015. Before the second part of the project begins a cultural resources survey will be conducted in the areas in which the stream stabilization and restoration will take place (the area now inundated by Highlands Reservoir). The findings of that report will also be submitted to the SHPO for review and comment.



Plate 1. View north, showing the 12-foot tall earthen Houston Dam at Highlands Reservoir. North Carolina State Highway 1538 is in the foreground. Note eroding face of the dam in left foreground.



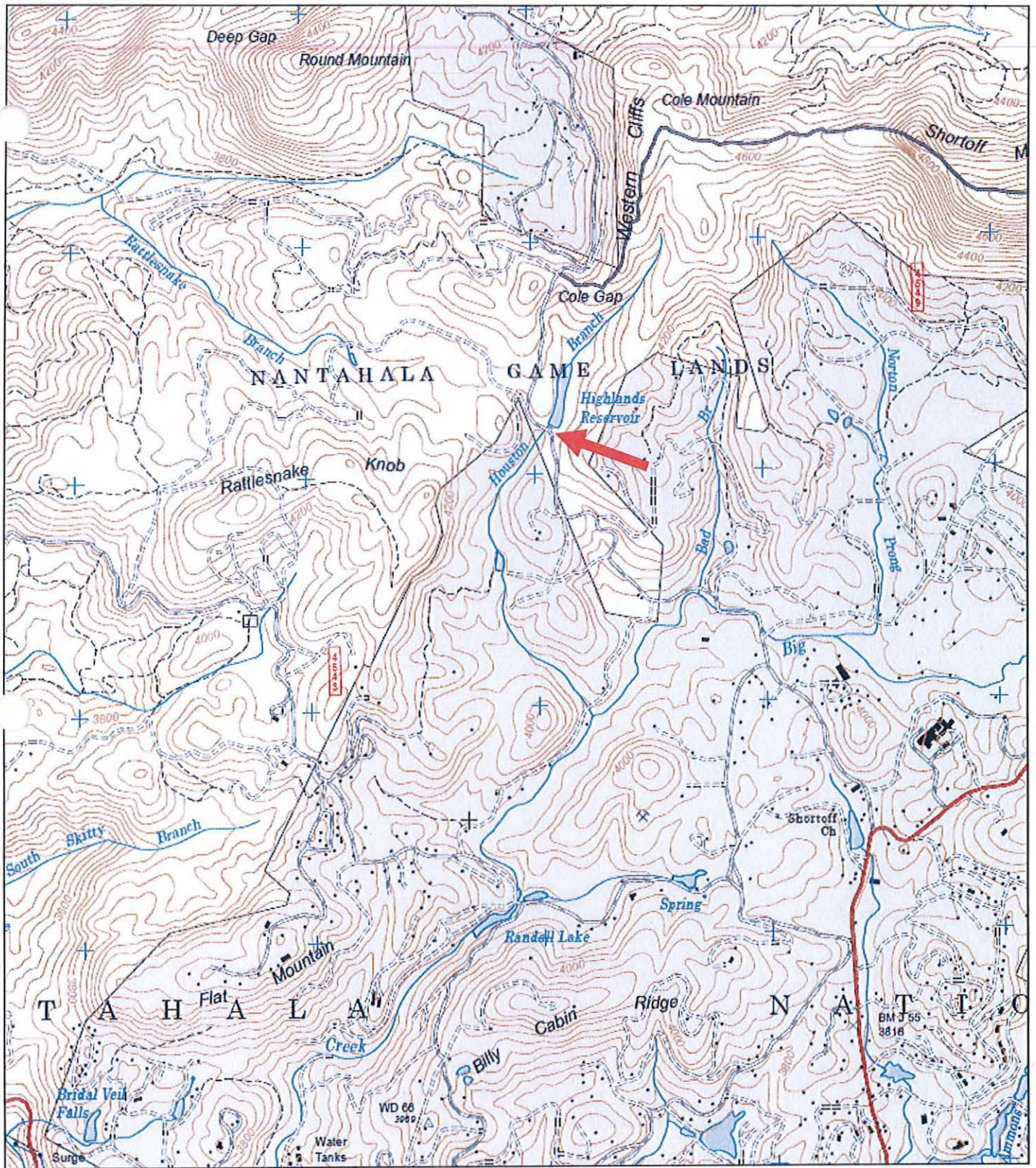


Figure 1. Highlands quad, 1:24,000 scale, showing the location (red arrow) of the Houston Dam on Highlands Reservoir.



## EARTHEN DAM CONSTRUCTION

The Houston dam is thought to be constructed of dirt covering a core of cement, based on a letter from a Mayor of Highlands, NC, in the 1970's, to the Forest Service stating that it was constructed in such a manner. The screen shots below are taken from *Earth Dams: a Study*, written by Burr Bassel, and published by the Engineering News Publishing Company of New York City in 1904 ([https://npdp.stanford.edu/sites/default/files/other\\_materials/earth\\_dams.pdf](https://npdp.stanford.edu/sites/default/files/other_materials/earth_dams.pdf)).

**CHAPTER V.**

*Different Types of Earth Dams.*

There are several types of earth dams, which may be described as follows:

1. Homogeneous earth dams, either with or without a puddle trench.
2. Earth dams with a puddle core or puddle face.
3. Earth dams with a core wall of brick, rubble or concrete masonry.
4. New types, composite structures.
5. Rock-fill dams with earth inner slope.
6. Hydraulic-fill dams of earth and gravel.

Figure 3. List of the different types of earth dam construction. Copied from page 33, Bassel, 1904.

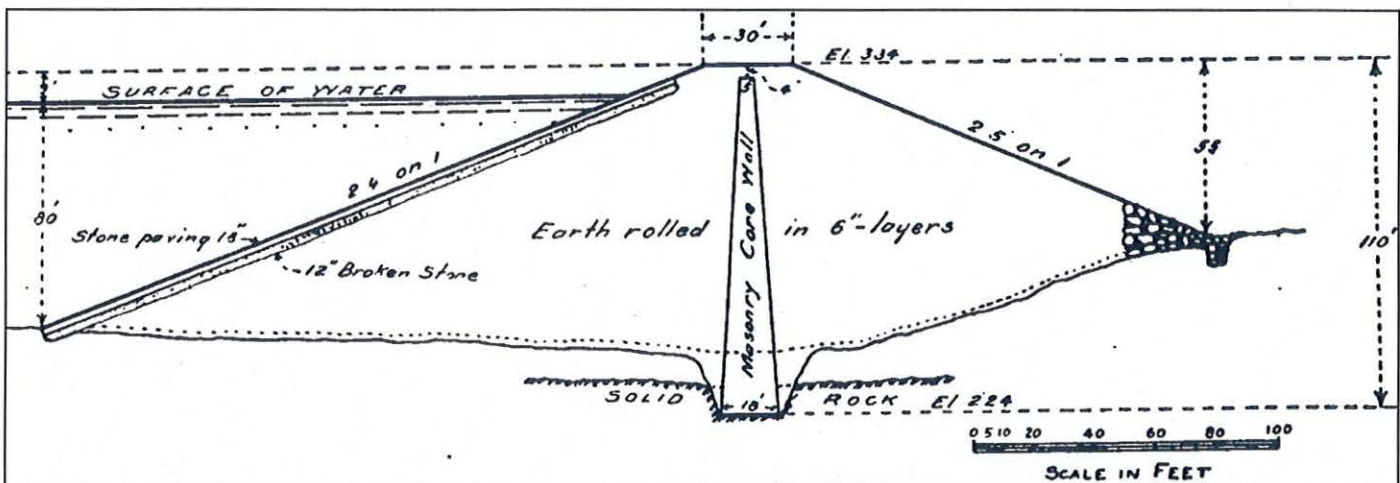


Figure 4. A cross-section diagram showing the construction of a typical earthen dam. The description of this dam states, "In the center is built a wall of rubble masonry, generally founded upon solid rock, and intended to stop the free seepage of water, but not heavy enough to act alone as a retaining wall for either water or earth." Copied from page 40, Bassel, 1904.



## BACKGROUND OF THE HOUSTON DAM

A thorough search for documents concerning the Houston Dam was conducted by the author, and the engineers involved with the project, at the Nantahala Ranger District office in Franklin NC, and the National Forests in North Carolina Supervisor's Office in Asheville, NC. Additional information was provided by employees of the town of Highlands, North Carolina. Very little documentation for the construction of the dam exists, but it is known that the dam was built in 1926, and then reconstructed in 1952. It was constructed of earthen fill over a concrete core with a core wall made of clay. The dam is approximately 12.3 feet high and impounds a reservoir of approximately 4.5 acres.

The tracts of land on which the dam is located (Tracts S-2-M-8 and S-2-M-42 in Figure 2) were purchased by the U.S. Forest Service from the Macon County Land Company in May of 1917 and January of 1919, respectively. In 1940, a Special Use Permit request was submitted by the town of Highlands, NC to the Nantahala National Forest to use this reservoir as a public water source. The permit included the operation of the earthen dam, the three acre reservoir, pipe lines and a security fence. In 1995, the town of Highlands requested termination of their special use permit for the Highlands Reservoir. Since that time the reservoir and dam have been unused except for the occasional attempt at fishing by local residents.

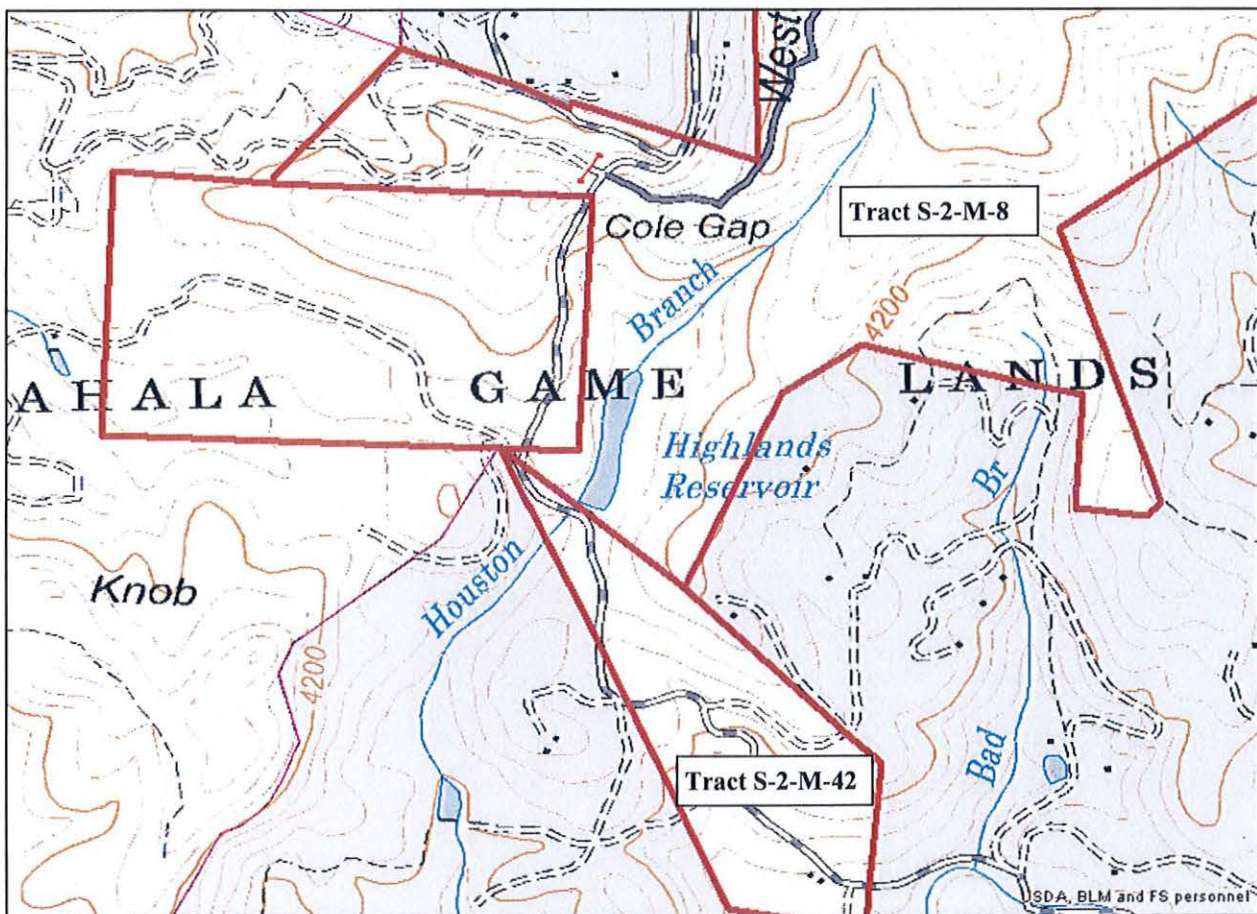


Figure 2. Highlands quad, 1:12,000 scale, showing the locations of Tracts S-2-M-8 and S-2-M-42 in relation to the Houston Dam/Highlands Reservoir.



For the past decade or so, the yearly inspections of the dam have shown indications of increasing structural and seepage problems with the dam and related facilities. The State Highway 1538 is just below the dam and the current spillway is a 5 foot by 1 foot channel that empties into a ditch that goes beneath the highway through a culvert. The 12 inch diameter metal culvert under the dam has deteriorated and collapsed and a large boil is present below the dam that has been noted in prior inspections (Plate 1). The plumbing that exists needs to be removed and needle grass (indicator of saturated soils) is growing all over the dam.



Plate 2. View south, showing the earthen dam in the background and the bedrock floor of the drained reservoir. Picture was taken about 3 - 5 years ago.





Plate 3. View north, showing the bedrock floor of the drained reservoir. Picture taken at the same time as the previous picture.

#### HIGHLANDS, NC-AREA NRHP PROPERTIES

A search of the North Carolina Department of Cultural Resources' (NCDCCR), Historic Preservation Office's (HPO) website (<http://www.hpo.ncdcr.gov/NR-PDFs.html#M>) for NRHP listed properties in the vicinity of Highlands, NC turned up a total of 11 properties: the Baldwin-Coker Cottage, Cabin Ben, the Church of the Incarnation, the Edwards Hotel, the First Presbyterian Church, the Thomas Grant Harbison House, the Highlands Inn, the Highlands North Historic District, the Playmore-Bowery Road Historic District, the Satulah Mountain Historic District, and the Jerry Wilson Log Home. The Houston dam/Highlands Reservoir is not associated with any of these properties, nor is it in close proximity to any of them.

A search for the phrase "earthen dam" on the HPO website resulted in a total of 61 results, but all of them are mentioned in association with a listed house, mill, or other such structure. From the research conducted for this project it is determined that the Houston dam is a deteriorating, obsolete structure that holds no historical, architectural, or cultural significance for the US Forest Service or the town of Highlands, North Carolina.



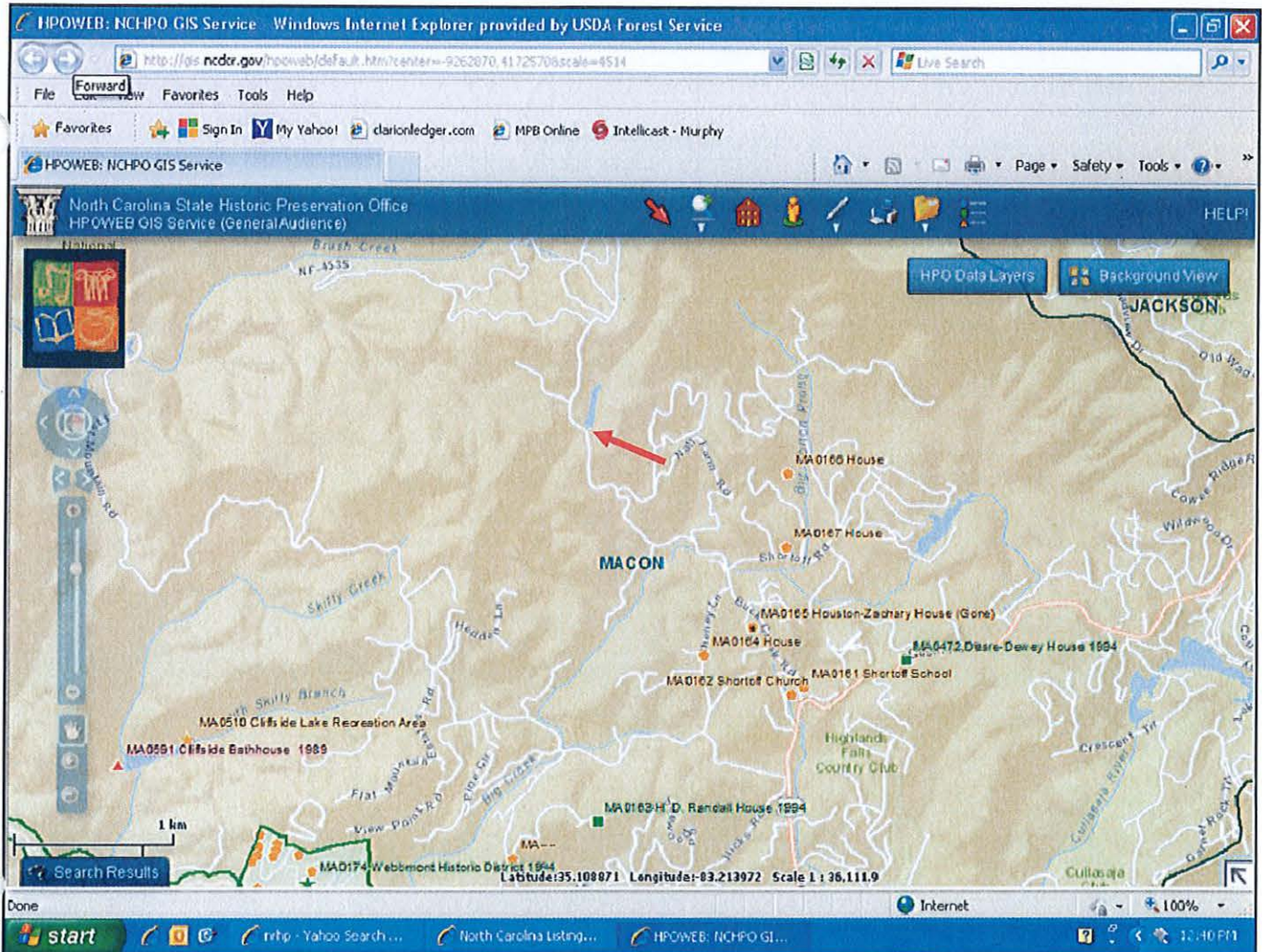


Figure 3. The map from <http://gis.ncdcr.gov/hpoweb/default.htm?center=-9262870,4172570&scale=4514> of the area surrounding the Houston dam (which is indicated by the red arrow) showing the NRHP surveyed properties in the general vicinity of the dam. These houses (orange dots) have been surveyed, but so far no determination of eligibility has been made, and none are associated with the Houston dam.

## DAMS ON U.S. FOREST SERVICE PROPERTY

Nation-wide there are 1,745 dams on Forest Service lands that meet the requirements of the National Inventory of Dams. The Forest Service owns and operates 499 of these dams. The remainder are non FS owned dams owned and operated under Special Use Permit or other authorities.

The FS owns a variety of dam types, including concrete arch, concrete gravity, timber crib, and even steel. However, embankment dams made of either earth or rock fill constitute more than 80 percent of the FS owned dams. Eighty percent have normal reservoir storage less than 500 acre feet. Recreation, wildlife, and fire are the primary purposes for the dams. Over half of FS owned dams are more than 50 years old. Non FS owned dams are owned and operated by other Federal, State, and local government agencies, public utilities, and private parties. Information gathered from: <http://www.fs.fed.us/eng/dams/>



## DAMS IN THE HIGHLANDS, NC-AREA

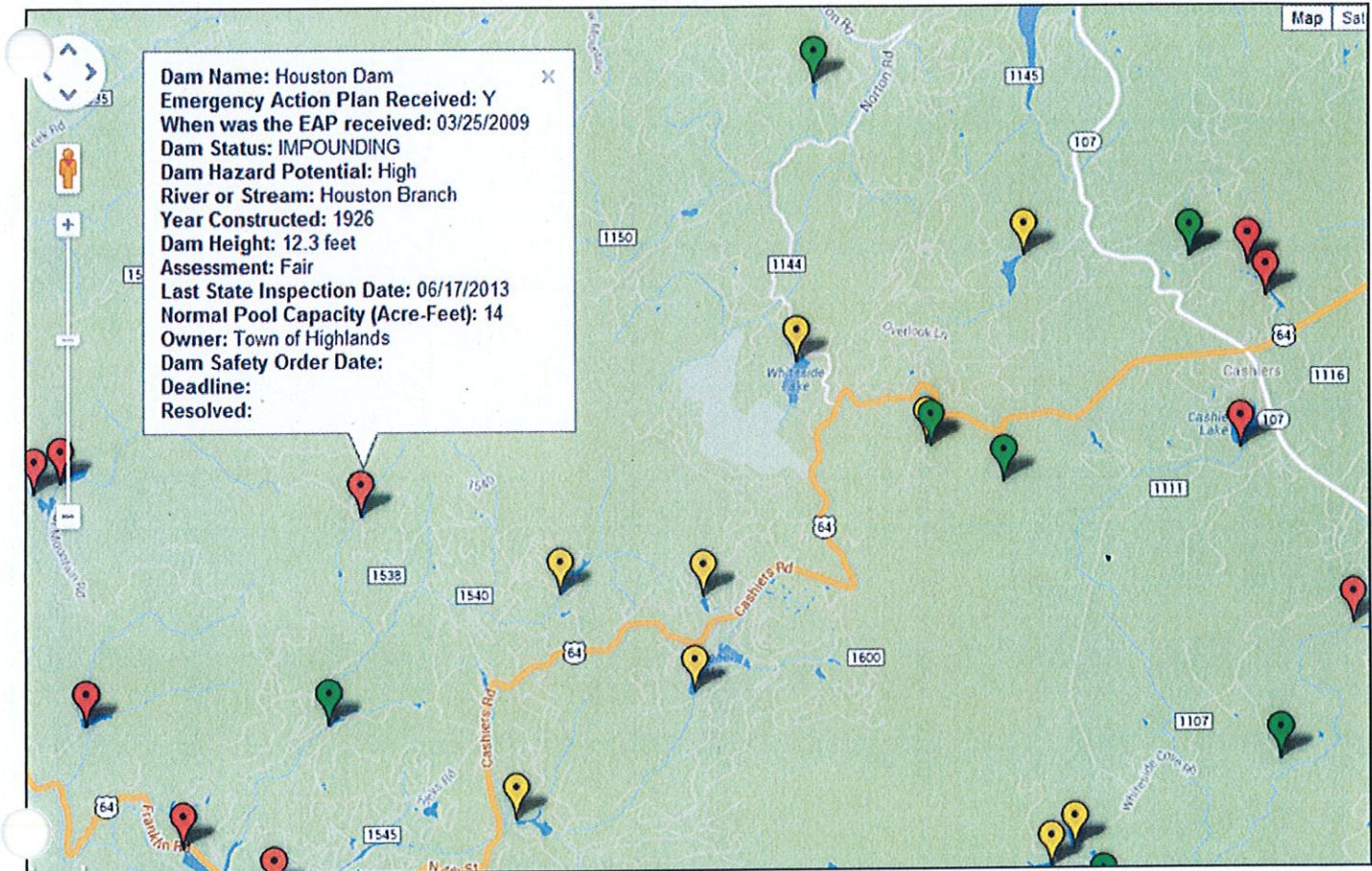


Figure 4. A small screenshot showing a portion of an interactive map indicating all of the known dams in the Highlands, NC area. This view is of the dams that are to the northeast of the town, and shows the information available for Houston Dam. This map was taken from: <http://www.wcnc.com/news/iteam/North-Carolina-has-more-than-5000-dams-232338021.html>

The online version of the interactive map shown above was used to survey the name, age and ownership of all of the dams in the general vicinity of Highlands, NC. The survey area encompassed all of the dams from the Georgia/North Carolina border to the south, Scaly Mountain to the west, the Town of Franklin, NC to the north, and the town of Cashiers, NC to the east. A total of 34 dams are located within this area (Figure 5).

The vast majority of these dams are privately-owned, with only two belonging to the Town of Highlands, and three owned by the U.S. Forest Service. Of the 34 dams the date of construction is known for only 10 of them, with half of those being owned by the Forest Service or the Town of Highlands.



Dam Name	Year Constructed	Ownership
Adventure Trek Camp	???	Blue Ridge Glen, Inc.
Anderson Lake	???	Private
Balfour Lake Lower	???	Balfour Land, Co.
Balfour Lake Upper	???	Balfour Land, Co.
Brooks Creek	???	Irving Galleries
Brush Creek Lower	???	Private
Brush Creek Upper	???	Private
Cashiers Lake	???	MPE Enterprises, Inc.
Cliffside Lake	1936	U.S. Forest Service
Club Lake	???	Highlands CC
Cold Springs Saddle Club	1976	Cold Springs POA
Cranston Pond	???	Private
Farmyr, Inc.	???	Private
Fisher Pond	???	Private
Highlands Biological Station	???	Highlands Biological Station
Holly Berry Mountain	???	Holly Berry Mountain Estates
Houston	1926	Town of Highlands
Lake Emerald	???	Holly Berry Mountain Estates
McCord	???	Private
Mirror Lake	1958	Mirror Lake Improvement Co.
Mountain Camp	???	SFGC, LLC
Osage Lake	1948	Rocky Knob HOA
Pearson	???	Private
Randall Lake	???	Private
Ravenell Lake	1965	Cullasaja Club
Rocky Knob	1988	Spring Lake Co.
Sequoyah	1926	Town of Highlands
Wildwood Mountain	???	Private
Whiteside	1949	Whiteside Estates
Wilson Creek Lower	1986	U.S. Forest Service
Wilson Creek Upper	1986	U.S. Forest Service

## FINAL RECOMMENDATIONS

After research and documentation of the history of the Houston Dam it has been determined that the dam is *not eligible* for listing in the National Register of Historic Places (NRHP) (36CFR60.4). In general, an earthen dam such as this is rather ubiquitous across the landscape of western North Carolina as shown by the list above. The Houston Dam is not associated with any significant event, significant person, distinctive characteristic or method of construction, nor could it provide significant information concerning the history of the Town of Highlands, the US Forest Service, or western North Carolina. In particular, the Houston Dam is over 50 years of age, being constructed in 1926, but due to its age, and it no longer being used by the town of Highlands, it has begun to deteriorate to a dangerous condition. The proposed demolition of the dam will have no effect on a property eligible to the NRHP.