INTRODUCTION

A Mitigation Banking Instrument (BI) was approved and executed in April of 2007 for G.D.E. Investments LA, LLC to establish guidelines and responsibilities for the establishment, use, operation, protection, monitoring, and maintenance of the G.D.E. Investments LA, LLC Mitigation Bank. This BI also defines performance standards, monitoring protocol and remedial actions so as to ensure the mitigation bank success.

The goal of the G.D.E. Investments LA, LLC Mitigation bank was to restore an agricultural area back to a self-sustaining forested wetland ecosystem by re-establishing and maintaining functions, values, and services from historical agricultural uses of the subject property according to the plan contained in the BI.

All of the acreage was rice fields at the time the BI was executed. The old rice levees were flattened and the dirt spread out using a tractor with a disk and a bulldozer to approximately 4 to 6 inches above grade to help retain water. No culverts were installed or removed. This has proved to be very successful in altering the hydrology back to one associated with a natural wetland as opposed to a very easy to drain and flood agricultural field.(#2)*

At the time of the planting, fire lines *(photo 6)* were installed along the edges of the planted areas for protection in the event of wildfire. Portions of the mitigation bank falls inside a high fenced area *(photo 2 & 8)* in which the owner has food plots, feeders, and ponds for the wildlife.

In January 2007, the owner planted 244 acres with a mixture of bottomland hardwood one year old bare root seedlings. In January of 2009, an additional 181 acres was planted using a mixture of bottomland hardwood one-year-old bare root seedlings. Species planted were: Willow Oak (*Quercus phellos*), Nuttall Oak (*Quercus texana*), Overcup Oak (*Quercus lyrata*), Sweet Pecan (*Carya illinoinensis*), Bitter Pecan (*Carya x lecontei*), Green Ash (*Fraxinus pennsylvanica*), Red Maple (*Acer rubrum*), Mayhaw (*Crataegus opaca*), Sugarberry (*Celtis laevigata*), American Elm (*Ulmus americana*), and Persimmon (*Diospyros virginiana*). The trees were planted on a 9'x9' spacing yielding 538 trees per acre.

Interim success criteria state:

1. Hydrology: By Year 3, site hydrology shall be restored such that the site meets the wetland criterion as described in the Corps 1987 Wetlands Delineation Manual.

2. A) For a given planting, a minimum of 300 seedlings per acre must survive through the end of the fourth year (i.e. Year 5) following successful attainment of the one-year survivorship criteria. Trees established through natural recruitment may be included in this tally; however, a range of 120 to 135 hard mast-producing seedlings per acre must be present. Exotic/invasive species may not be included in this tally.

   B) By Year 5 following successful attainment of the one-year survivorship criteria, the bank acreage and the perimeter of that acreage shall be virtually free (approximately 5% or less on an acre-by-acre basis) of exotic/invasive vegetation.

   C) Planted tracts must exhibit characteristics and diversity indicative of a viable native forested wetland community commensurate with stand age and site conditions by Year 5. Achievement of a wetland vegetation community where more than 50% of all dominant species are facultative ("FAC")

or wetter, excluding FAC-plants, using "routine delineation methods: as described in the "Corps of Engineers Wetland Delineation Method," Technical Report 87-1 ("1987 Manual").

LOCATION

The Bank encompasses approximately 517.3 acres and is located off Louisiana State Highway 106 in the Community of Beaver approximately 5 miles west of Oakdale, and approximately 20 miles northwest of Ville Platte, Louisiana in Sections 5, 8, 9, and 16, T3S, R2W in Evangeline Parish. According to the BI, with certainty 278.3 acres of the site was eligible to be restored to forested wetlands.

METHODS

In August of 2012, 12 permanent 1/50th –acre circular survey monitoring plots *(photos 1 & 3)* were established. These 12 plots covered a total area of .25 acres (12 x .02 acres = .24 acres). The GPS coordinates were taken at plot center of each plot and then plot center was marked using an 8-foot PVC pipe anchored with metal T posts. A map of the mitigation bank denoting the location of each plot is attached to this report (Attachment 1). All trees within the survey plot were permanently marked and numbered. The number, species, height, diameter at breast height (if applicable), and origin (planted or volunteer) of the tagged trees within each plot were documented. A spreadsheet for each individual plot listing the measurements for each plot (Attachment 2-13) is also attached to this report. The number of trees was then divided by the area of the plot to obtain the number of trees per acre.

RESULTS

A total of 80 planted trees and 164 volunteer trees were located within the 12 monitoring plots. It should be noted that 74 of the 164 volunteer trees were exotic species and do not count toward survival goals; therefore, only 90 volunteers are used in computing trees per acre. The planted trees are averaging 333 trees per acre thus resulting in a survival rate of 62% (80 trees / .24 acre = 333.33 trees per acre / 538 trees per acre planted = 62%). When the 90 volunteer trees are added with the planted trees, the Bank is averaging 708 trees per acre total (170 trees / .24 acre = 708 trees per acre). The volunteer species are comprised of mainly Sweetgum (*Liquidambar styraciflua*) and Loblolly Pine (*Pinus taeda*).

The invasive/exotic species are averaging 308 trees per acre (74 trees / .24 acre = 308 trees per acre) which equates to 44% (308 exotic trees per acre / 708 total trees per acre = 44%) of the total trees per acre. This is well above the 5% threshold, so an herbicide treatment will need to be applied to control these stems. In the 2007 planting, the exotics make up 71% of the stems per acre, while in the 2009 planting they only account for 7% of the stems per acre. The exotics are more numerous along the edges of the mitigation bank. This is due to them moving in from adjacent properties that have a high amount of large seed bearing trees on them. The exotics do not appear to be having any effect on the growth of the other trees in the plots as the planted trees and the other volunteers are all taller than the exotics. It is recommended that the 2007 planting be treated in 2 years when the planted trees and other volunteers have reached canopy closure. By doing this, the chemical can kill any existing exotic species and the canopy closure will shade out any exotics that may germinate. If the tract were to be sprayed now, there is enough sunlight touching the forest floor that any seeds that may germinate would be free to grow. This would mean that another herbicide treatment would be needed in 2 to 3 years. The recommendation for the 2009

planting is that it also be sprayed when it reaches canopy closure in 4 to 5 years for the same reasons listed for the 2007 planting.(#3)*

Vines and other vegetation are very well established on all the plots. Vegetation that was observed includes: Goldenrod (*Solidago sp.*), Dog Fennel (*Eupatorium capillifolium*), Dewberry (*rubus sp.*), Purple Vervain (*Verbena bonariensis*), Sedges (*Cyperus sp.*), and Baccharus (*Baccharus halimifolia*).

Included with this written report is an excel spreadsheet for each individual plot listing species, height, diameter at breast height (when applicable), volunteer/planted, and exotic/natural. The gps coordinates of each plot are also given along with the year established, planting rate, herbaceous species observed, and visual cover estimates. There is also an aerial photograph of the north half and the south half of the mitigation bank showing the location of the plots, each reforested plot of the bank with the acreage and planting date, the location of the ponds, food plots, high fence, fence corners and gates, and roads. The following aerial photographs are also included:

1. Fence and establishment year location aerial map.
2. Fire line location aerial map.
3. Food plot location aerial map.
4. Road and pond location aerial map.

Labels, dimensions, and acreages are given in table form on the maps when needed.

OBSERVATIONS

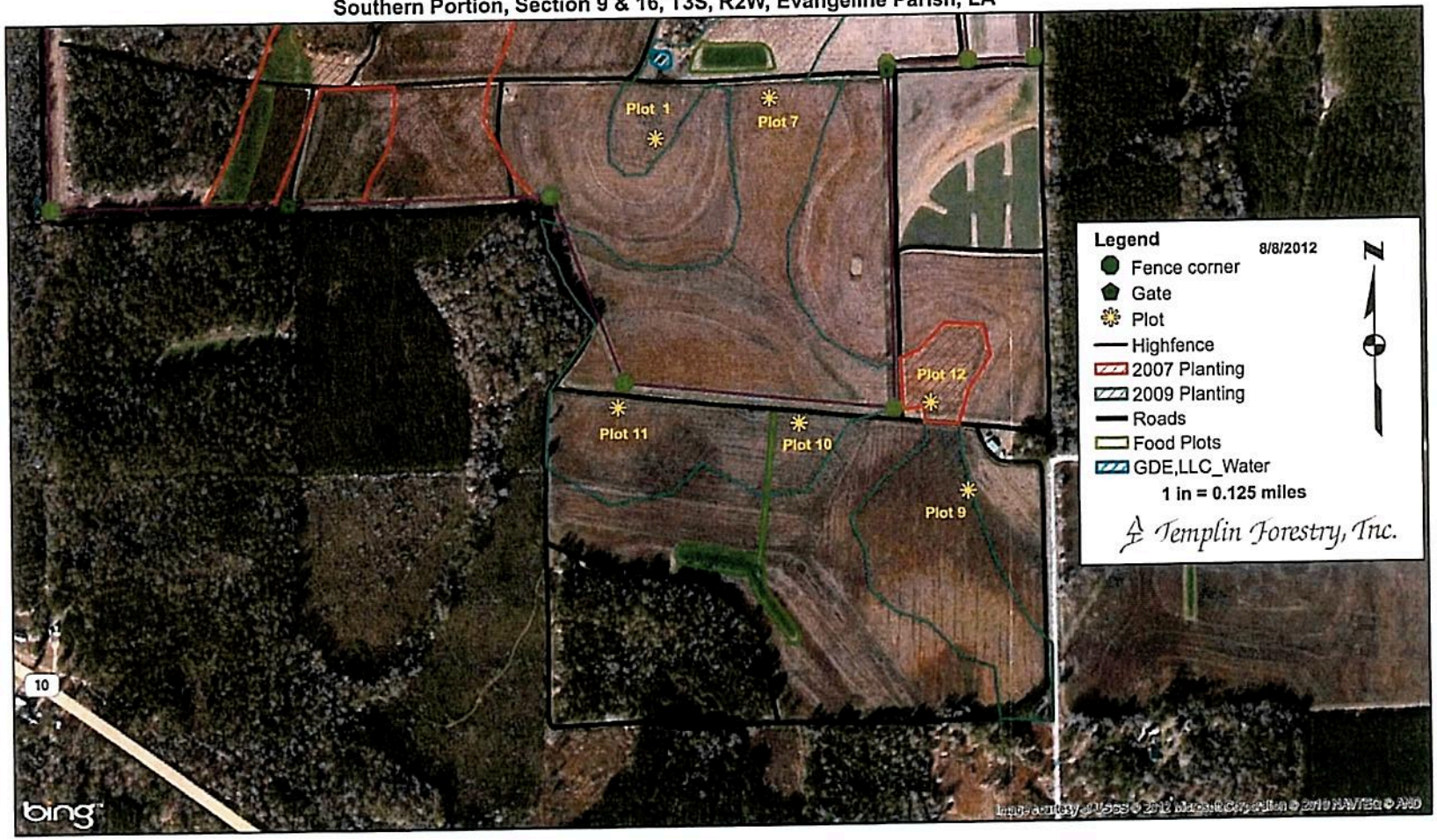
All of the trees both planted and natural are healthy and appear to be thriving thanks in large part to the hydrological changes that were put in place. The majority of the area in the mitigation bank and that area that adjoins the mitigation bank is comprised of shallow areas of standing water and moist soil conditions.

There is an abundance of wildlife present *(photos 7 and 8)* and utilizing the subject property for cover and feeding. Thanks to the 19.73 acres of food plots (9.78 acres of food plots in the bank and 9.95 acres on adjoining planted areas) along with the wild game feeders *(photos 4 & 5)* that are present, there was very little browsing noted on the planted seedlings while measuring the monitoring plots. The wildlife are also utilizing the 4 ponds *(photos 4 & 5)* that are located in or near the mitigation bank. There were multiple white tail deer, turkey, raccoon, and rabbit sightings while measuring the plots. There is also an abundance of songbirds and insects using this ecosystem.

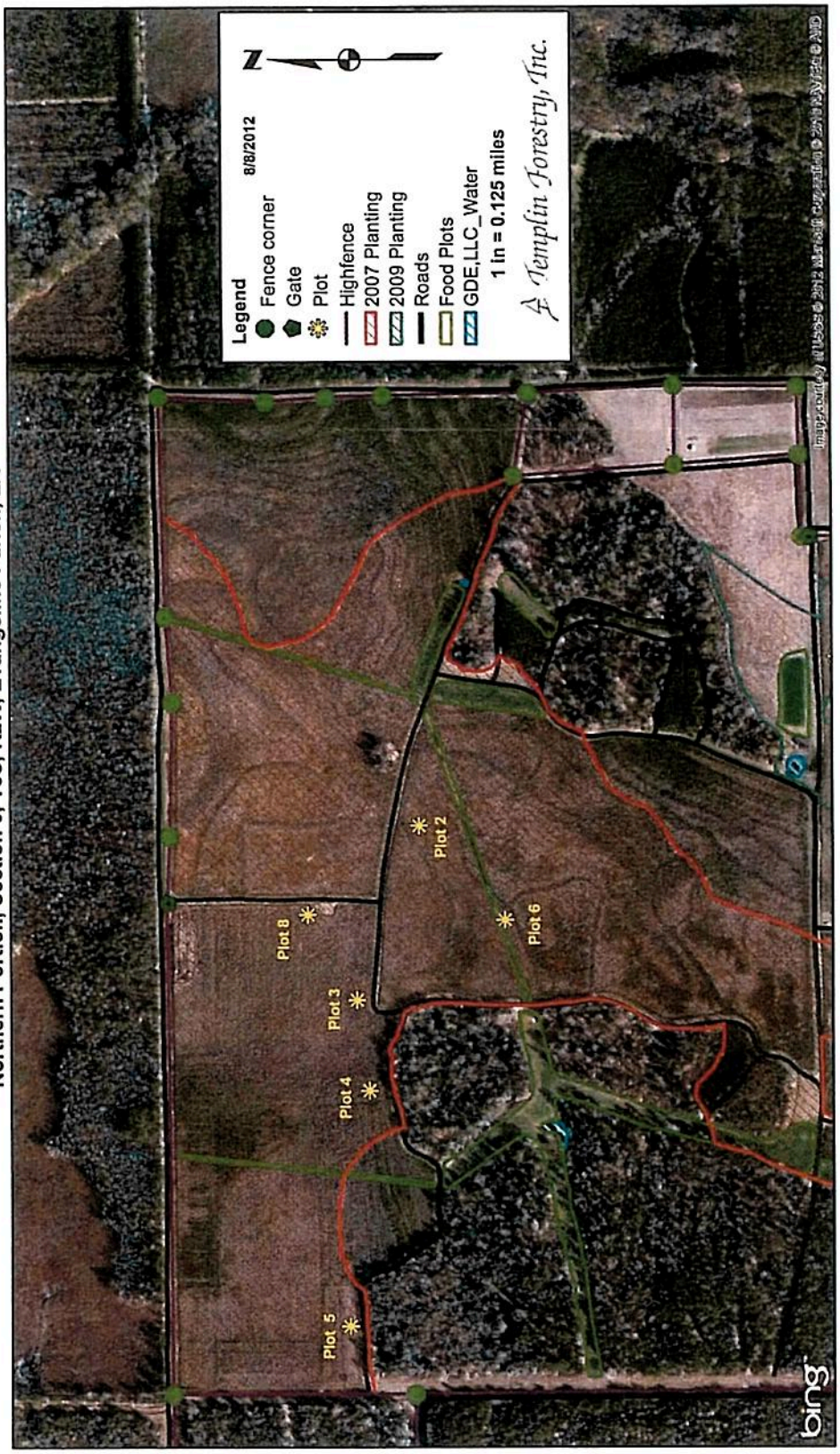
CONCLUSION

The effort to restore an agricultural area back to a self-sustaining forested wetland ecosystem by re-establishing and maintaining functions, values, and services from historical agricultural uses on the subject property appears to be working very well. The area adjacent to the mitigation bank that presently is not in the mitigation bank but has been treated the same from the beginning appears to have the same vegetation layers, vegetation characteristics, and soil conditions as the mitigation bank. The owner is well on his way to reaching his ultimate goal of a self-sustaining forested wetland ecosystem to be enjoyed by man and nature alike.

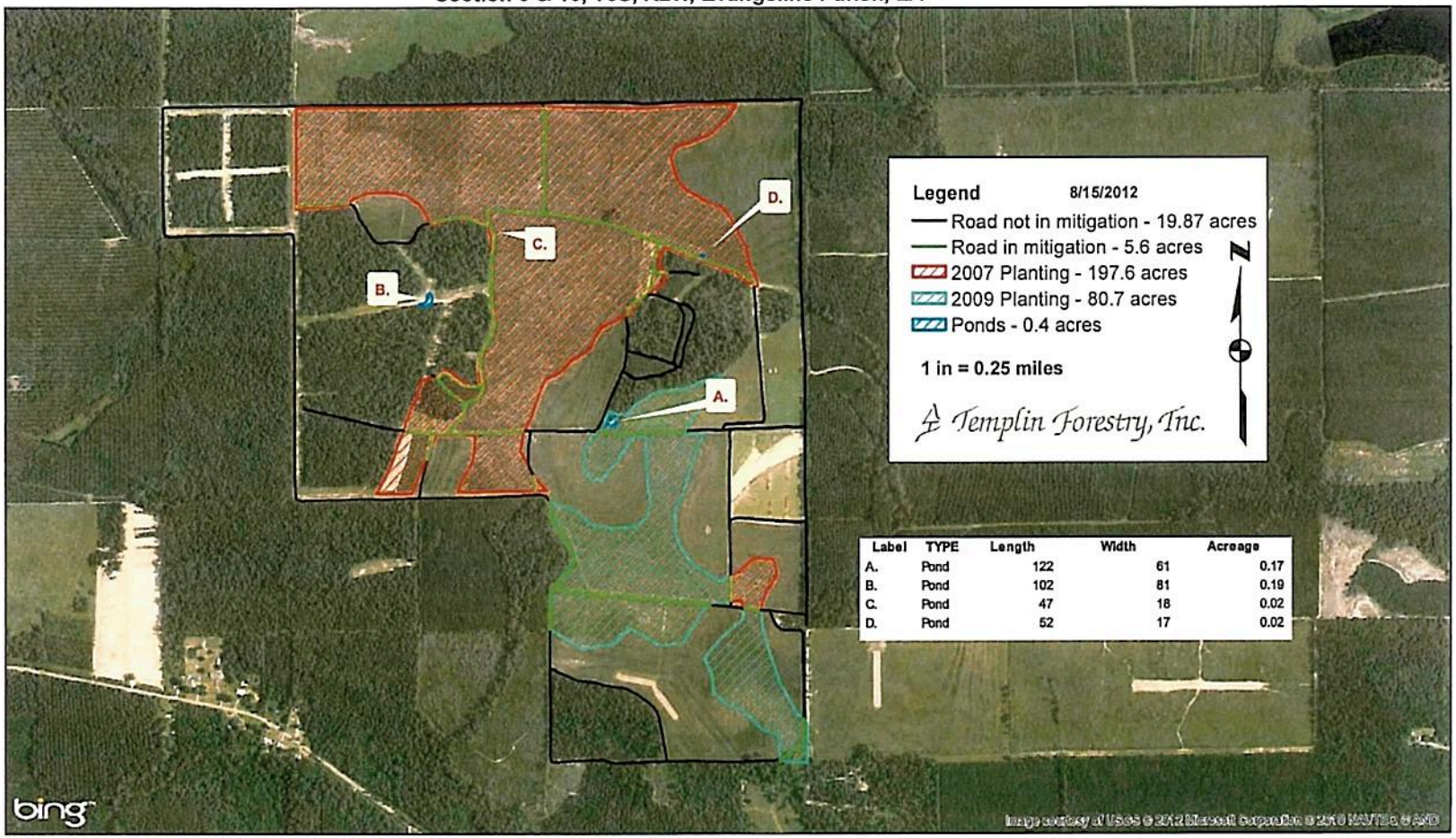
GDE Investments LA, LLC Mitigation Bank
Southern Portion, Section 9 & 16, T3S, R2W, Evangeline Parish, LA



GDE Investments LA, LLC Mitigation Bank
Northern Portion, Section 9, T3S, R2W, Evangeline Parish, LA

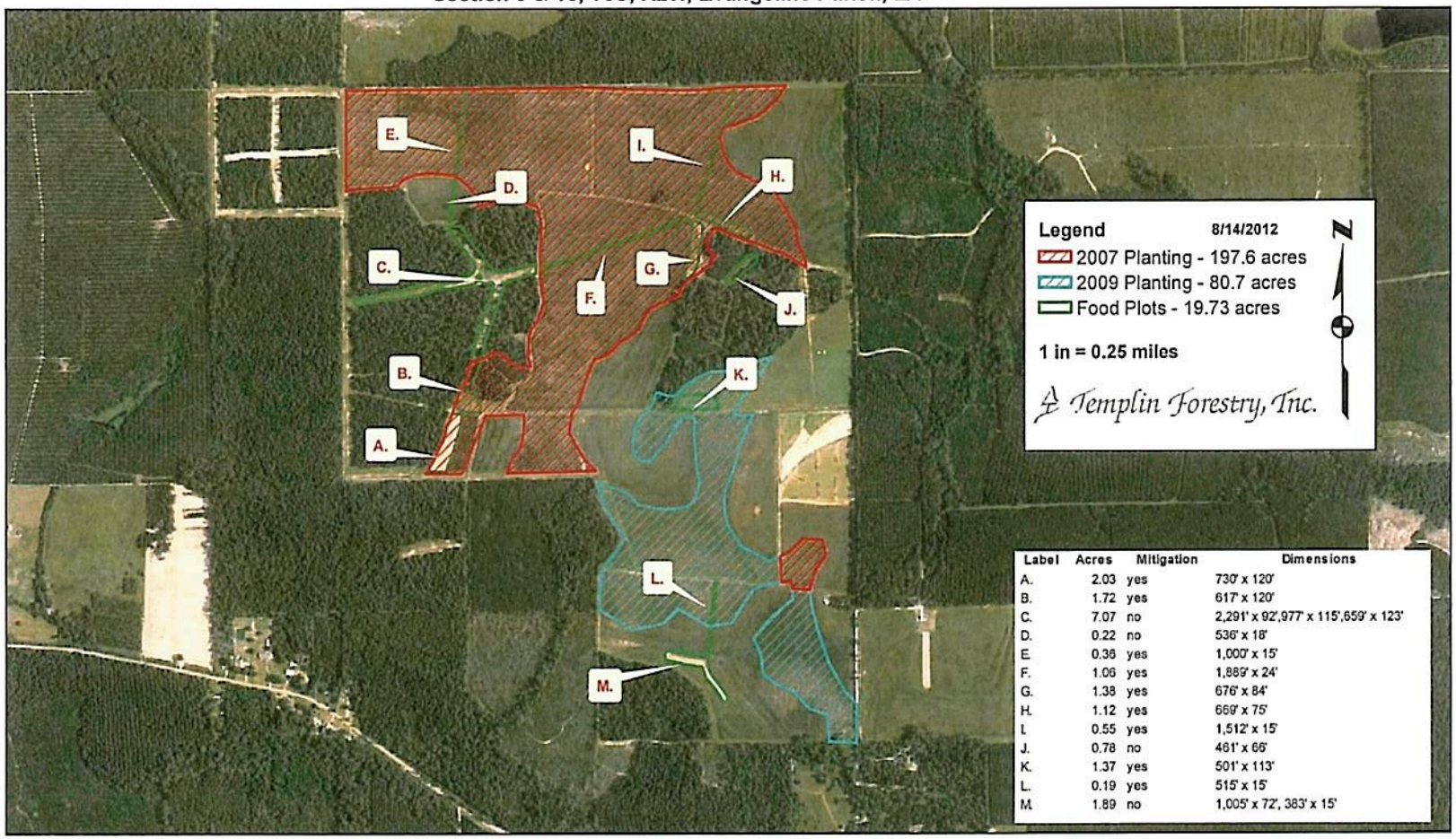


GDE Investments LA, LLC Mitigation Bank
Section 9 & 16, T3S, R2W, Evangeline Parish, LA



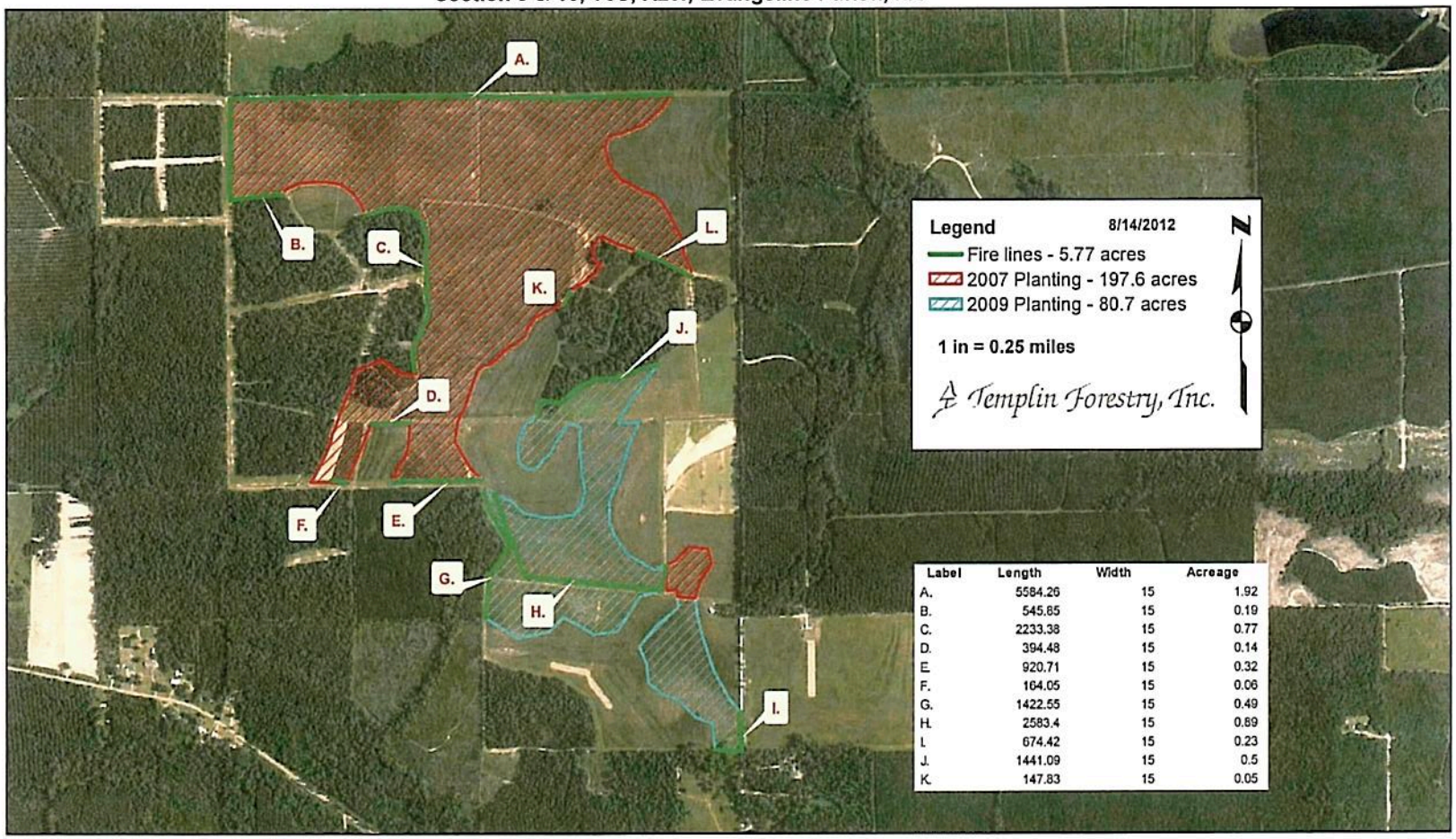
Label	TYPE	Length	Width	Acreage
A.	Pond	122	61	0.17
B.	Pond	102	81	0.19
C.	Pond	47	18	0.02
D.	Pond	52	17	0.02

GDE Investments LA, LLC Mitigation Bank
Section 9 & 16, T3S, R2W, Evangeline Parish, LA



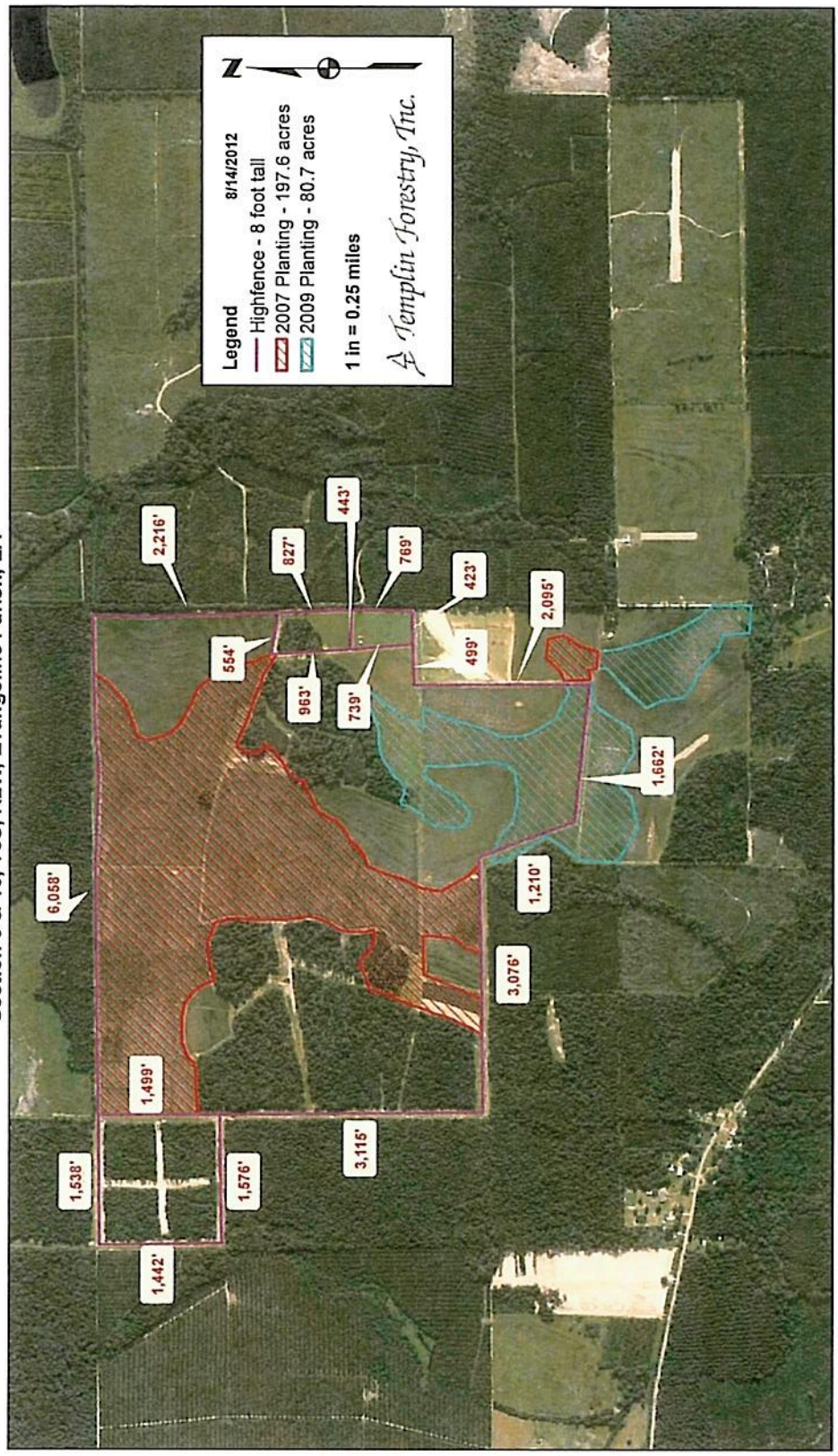
Label	Acres	Mitigation	Dimensions
A.	2.03	yes	730' x 120'
B.	1.72	yes	617' x 120'
C.	7.07	no	2,291' x 92',977' x 115',659' x 123'
D.	0.22	no	536' x 18'
E.	0.36	yes	1,000' x 15'
F.	1.06	yes	1,889' x 24'
G.	1.38	yes	676' x 84'
H.	1.12	yes	669' x 75'
I.	0.55	yes	1,512' x 15'
J.	0.78	no	461' x 66'
K.	1.37	yes	501' x 113'
L.	0.19	yes	515' x 15'
M.	1.89	no	1,005' x 72', 383' x 15'

GDE Investments LA, LLC Mitigation Bank
Section 9 & 16, T3S, R2W, Evangeline Parish, LA



Label	Length	Width	Acreage
A.	5584.26	15	1.92
B.	545.85	15	0.19
C.	2233.38	15	0.77
D.	394.48	15	0.14
E.	920.71	15	0.32
F.	164.05	15	0.06
G.	1422.55	15	0.49
H.	2583.4	15	0.89
I.	674.42	15	0.23
J.	1441.09	15	0.5
K.	147.83	15	0.05

GDE Investments LA, LLC Mitigation Bank
Section 9 & 16, T3S, R2W, Evangeline Parish, LA



GDE Investments LA, LLC Mitigation Bank
Field Investigation Photographs
Monitoring Report August 2012

Photo1. Sample plot of 2007 hardwood mitigation planting with both planted and volunteer trees flagged.

Photo 2. High fence and fire lines around 2009 mitigation bank planting.

Photo 3. Sample plot of 2009 hardwood mitigation planting with both planted and volunteer trees flagged.

Photo 4. Pond with feeders along edge of mitigation bank.

Photo 5. Pond and food plot in mitigation bank.

Photo 6. Fire line between existing woods and mitigation bank.

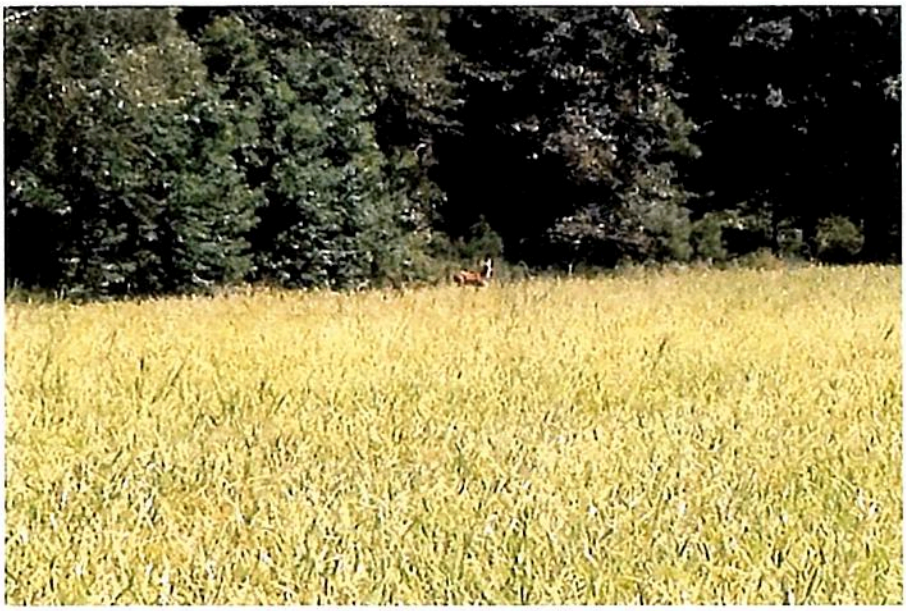


Photo 7. Deer in food plot in mitigation bank.

Photo 8. Pair of doves sitting on high fence bordering mitigation bank.