TOWN OF RED HOOK BUILD-OUT ANALYSIS

ESTIMATING THE IMPACTS OF GROWTH UNDER EXISTING, PROPOSED, AND ALTERNATIVE LAND USE CONTROLS

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TOWN OF RED HOOK BUILD-OUT ANALYSIS

Introduction

A build-out analysis is a planning tool that "*estimate[s] the impact of cumulative growth upon a town's land areas once all the developable land has been consumed and converted to uses permitted under the current regulatory framework.*"[1] A build-out analysis provides a peek into the future by examining probable future development intensities and patterns. It helps residents to visualize the patterns of growth permitted by the Zoning and is a "test" to see if the goals of the community's *Comprehensive Plan* are working. For example, if a community priority is to preserve greenspace and farmland but the Zoning regulations allow for development of residential uses across all lands (including farmland and other large land holdings), then farmland and greenspaces are likely to disappear and the goal will not be attained, unless changes are made.

As you drive into towns around the State, you often see a sign "Zoning Enforced" or "Zoning in Effect." These signs may reassure many residents that they are being protected against unwanted development. But not everyone understands that zoning regulations generally prescribe development of all buildable land. Zoning regulations are the primary means that a community uses to determine how land is to be developed. A build out analysis "tests" those regulations to see if they will achieve goals established by the community for its future.

A build-out analysis can assist residents and decision-makers in understanding, ahead of time, the impacts development may eventually have on the community. It identifies increased fiscal expenditures for public services and infrastructure that may need to be built, expanded or improved to accommodate growth, and can help Town officials estimate the costs and revenues required by local government. It also helps to identify other impacts such as traffic congestion, loss of open space, and impacts to other natural resources such as groundwater and surface water. A build-out analysis helps in the selection of policy alternatives to accommodate or mitigate new development that will occur, but more in line with community goals. It can also foster identification of appropriate land uses and densities in the community.

This build-out analysis was undertaken by the Town of Red Hook to assess the impacts of the current Zoning, the proposed Centers and Greenspaces amendments, and the various alternatives to the proposed amendments that are outlined in the Final Scoping Document for the Draft Generic Environmental Impact Statement (DGEIS) for the proposed amendments.

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[1] *Manual of Build-Out Analysis*, Center for Rural Massachusetts.

Summary

The build-out analysis indicates that the current Zoning would permit the development of 3,588 new single family dwelling units in the Study Area[2]. The impact of this build-out would be an increase in the Town's population of 11,089 new residents including an additional 2,479 school age children, an additional 7,176 vehicles making 34,337 additional vehicle trips per day on local roads, an additional 1,148,160 gallons of water consumed and an equal amount of sewage to be disposed of per day, and the need to add 22 new police officers and 18 new firefighters. There are currently 1,128 dwellings in the Study Area[3], and in 2008 the Town's population was approximately 8,455 persons.[4]

In comparison, if the existing Zoning were amended as proposed, the total number of dwelling units, population, school-aged children and infrastructure impacts would be reduced as compared to the above figures as follows: there would be potentially 1,388 new dwelling units and 4,226 new residents, including 940 children needing to go to school, an additional 2,776 vehicles making 12,436 additional vehicle trips per day on local roads, an additional 435,280 gallons of water per day consumed, and the need to add 8 new police officers and 7 new firefighters.

If the Town does nothing to refine its current planning and zoning practices, the consequences will likely take the form of the build-out analysis results described in this report. Table F in this report summarizes the results of the current zoning, the proposed action, and the various alternatives analyzed. The results indicate that all of the alternatives to the existing Zoning that have been studied will have substantially reduced environmental impacts.

Steps in the Build-out Analysis Process

The steps to undertaking a build-out analysis are relatively straightforward. First, public lands and lands that are encumbered with a conservation easement are deducted from the gross acreage under study. On the remaining acreage, lands not suitable for development are subtracted. This includes lands that are subject to environmental constraints that, by their very nature or due to laws restricting development (like wetlands), are not likely to be developed in the future. Different constraints are deducted depending on the requirements of the regulations under study. An additional deduction is made to account for development-related infrastructure (such as roads and drainage) and inefficiencies in lot layout. The result is a net buildable acreage. Existing dwelling units are deducted from this acreage. The Zoning regulations are then applied

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[2] The Study Area is defined on page 3.

[3] There are an additional 1,090 dwelling units on lands in Study Areas C and D which were not included in the build-out analysis since they are already fully developed; see discussion on pages 5 - 6.

[4] Source: US Census Bureau estimate for 2008. The Town population cited here does not include the two Villages.

as if all lands both suitable and available for development were to be developed with their 'highest and best' use. In this way, a reasonable estimate of potential new residential development can be made. Build-out analyses typically use reasonably conservative assumptions to consider the greatest impact scenarios and to equally compare various options. The time frames for a full build-out are often considered 20 years or longer.

The last step is to translate the estimate of potential new dwelling units into important trends such as population growth, traffic, water consumption, and the cost of providing community services, such as education, fire and police protection, for this added population.

Methodology

The Town of Red Hook build-out analysis was aided by a Geographic Information System (GIS) consisting of relevant geospatial data including tax parcels, New York State Protected (DEC) wetlands, Federal Jurisdictional (ACOE) wetlands,[5] streams, waterbodies, slopes, and Federal (FEMA) 100-year floodplains.

The Study Area includes the following: lands to be included in the proposed Agricultural Business (AB) District (Study Area A); lands to be included in the proposed Traditional Neighborhood Development (TND) Residential Subdistrict (Study Area B); lands not included in either of the preceding that are currently zoned R1 and R1.5 where the water bonus is proposed to be deleted (Study Area C); remaining lands in the Town exclusive of: educational institutions (Bard College, Mill Road Elementary School, the Devereaux Foundation); the NYS property on Turkey Hill Road; lands in the Hamlet Districts; and existing or proposed commercial districts (Study Area D) since purpose of the build-out analysis was to determine the permitted number of additional residential dwellings.[6] See Figure 1.

The gross (total) acreage of lands was first calculated.

Next, the acreage of easement protected and public lands was calculated and deducted from the gross acreage. The build-out analysis was conducted on the remaining lands (the Net Unprotected Acres). See Figure 2.

The combined area of environmental constraints was subtracted from the Net Unprotected Acres to yield the Net Developable Acres.

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[5] As shown on the US Fish and Wildlife Service's National Wetland Inventory (NWI) maps, but such maps merely illustrate potential wetland areas based on aerial photographs. Actual Federal wetlands may be more or less than what the NWI Maps show. For the purposes of this study, it was assumed that all wetlands shown on NWI maps were actual wetland areas.

[6] Some residential development could occur in the commercial districts, but it is not a significant amount and would be similar in all of the alternative zoning scenarios studied.

The Net Developable Acres was further reduced by a percentage specified in each alternative to account for necessary infrastructure (roads and drainage) and inefficiencies in lot layout. The percentage was taken from Column D (the Net Unprotected Acres) and was deducted from Column F (the Net Developable Acres), as shown by example in Table 1 in Appendix A (page 32). This is the methodology required by the current Zoning and it was used in the other alternatives to be consistent.[7] This yielded the Buildable Acres.

Buildable Acres were then divided by the minimum lot size or density standard resulting in Total Lot Count (decimals truncated).

From this number, the existing dwelling units were subtracted to determine Potential New Lots.

For the purpose of the analysis, existing dwelling units on the Net Unprotected Acres were tallied using the following assumptions for a conservative estimate:

(1) Mobile homes were calculated as single family dwellings.

(2) Multiple family structures (based on the classification of the real property tax codes) were calculated as the equivalent of two single family dwellings.

(3) Multiple use structures were calculated as the equivalent of one single family dwelling.

For instance, if the GIS data indicated that there were 6 single family dwellings, 2 mobile homes, 2 multiple family dwellings, and 1 multiple use, that would yield the equivalent of 13 single family dwellings.

With the exception of the proposed TND District, where a minimum of three different housing types is required, all new development is assumed to be single-family dwellings. This type of development is one of the primary principal uses in the Study Area and the most common form of residential development proposals in the Town. Single family dwellings typically produce the greatest impact to municipal/school services[8].

Additional methodology specific to each alternative is discussed below along with the results of the build-out analysis.

1. Current Zoning (No Action Alternative)

(a) Lands in the Study Area are currently Zoned as follows:

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[7] As discussed below, no deduction for infrastructure was made if it was not required by the Zoning Law or if land would be conserved and therefore no infrastructure would be installed (as in the "conservation option" of the AB District).

[8] See Rutgers University, Center for Urban Policy Research, *Residential Demographic Multipliers*, June 2006.

- Study Area A: Limited Development (LD), Rural Development 5 (RD5), Rural Development 3 (RD3), Residential 1.5 (R1.5), and Institutional (I). See Figure 3.
- Study Area B: R1 and R1.5. See Figure 4.
- Study Area C: R1 and R1.5. See Figure 5.
- Study Area D: RD3, RD5, LD, Waterfront Conservation (WC), and Institutional. See Figure 6.

(b) Lands in each of the above Zoning Districts within the Study Area were analyzed separately, as shown in Table 1 in Appendix A (page 32).

(c) The Town's current requirements for the deduction of environmental constraints in the calculation of permitted density in § 143-23 of the Zoning Law can only be applied on a lot-by-lot basis. Since this is beyond the scope of a build-out analysis, the formula method for calculating permitted density found in § 143-33 of the Zoning Law was used instead. The combined area of the following environmental constraints listed in § 143-33B(b) was deducted:

(i) DEC regulated wetlands

(ii) FEMA 100-year floodplains

(iii) Streams (calculated as 10′ wide)

(iv) Waterbodies

(c) To account for necessary infrastructure (roads and drainage), and for inefficiencies in lot layout, the percentages specified in § 143-33B(1)(b)[3] of the Zoning Law were used as a basis, as follows: 4% in the LD and RD5 Districts, 6% in the RD3 District, and 10% in the R1.5 and R1 Districts. The current Zoning Law does not specify a deduction for the I and WC Districts. Since permitted density in the I District is the same as in the LD and RD5 Districts (1 dwelling unit per 5 acres), the infrastructure deduction for the LD and RD5 Districts (4%) was used for the I District. Since permitted density in the WC District is half the permitted density as in the LD and RD5 Districts (i.e., 1 dwelling unit per 10 acres), a 2% deduction for infrastructure was used for the WC District. For the proposed TND District (Study Area B), the 10% deduction specified for the R1 and R1.5 Districts was used. This resulted in the calculation of Buildable Acres.

(d) All R1 and R1.5 lands assume the water bonus as currently permitted by the Zoning Law.

(e) Many parcels in Study Area C are currently developed at their fullest permitted density. To yield the most accurate build-out calculation, fully developed parcels were not included in the build-out analysis. Lands in this area were studied as follows:

- For lands Zoned R1, the build-out analysis studied all parcels greater than 1 acre in size (excluding two parcels already developed as mobile home parks) since a minimum of 1 acre would be necessary for subdivision in the R1 District with the water bonus (which would permit 1 dwelling unit per ½ acre). See Figure 7.
- For lands Zoned R1.5, the build-out analysis studied all parcels greater than 2 acres in size since a minimum of 2 acres would be necessary for subdivision in the R1.5 District with the water bonus (which would permit 1 dwelling unit per 1 acre). See Figure 8.

(f) Many parcels currently Zoned RD5 and LD in Study Area D are currently developed at their fullest permitted density. To yield the most accurate build-out calculation, fully developed parcels were not included in the build-out analysis. Lands in this area that were studied include vacant parcels and parcels greater than 10 acres in size, since a minimum of 10 acres would be necessary for subdivision in these Districts (see Figure 9). Since both of these Districts have the same permitted density (1 du/5 acres), they were studied together.

(g) Lands in educational use (Bard College, Mill Road Elementary School, and the Devereux Foundation) and the NYS property on Turkey Hill Road were not included in the analysis since they are unlikely to be developed for residential uses. Similarly, lands in the Hamlet Districts were excluded from analysis because these small areas are nearly built-out and would permit little additional development. Finally, because the purpose of this build-out analysis was to determine the permitted number of additional residential dwellings under the Zoning, the existing or proposed commercial districts were not included.

The results of the above calculations are presented in Table 1 in Appendix A (page 32). The build-out analysis has found the potential for **a total of 3,588 new single family dwellings in the Study Area under the current Zoning regulations**. This would result in over four times more homes than the 1,128 dwelling units that currently exist.

2. Proposed Amendments

(a) The combined area of the following environmental constraints listed in § 143-23 of the proposed Zoning Amendments was deducted from the Net Unprotected Acres in Study Area A for the conservation option[9] of the proposed AB District, and in Study Areas C and D:

(i) State DEC regulated wetlands and the regulated 100′ adjacent area

(ii) Federal ACOE regulated wetlands

(iii) Federal FEMA 100-year floodplains

[9] The limited development option of the AB District does not require deductions for environmental constraints.

(iv) Streams with a 60′ buffer[10]

(v) Waterbodies with a 50′ buffer

(vi) Steep slopes of 20% or greater

(b) For Study Area B, (the proposed TND Residential Subdistrict), § 143-49.1 G(1) of the proposed Zoning amendments would require the deduction of State DEC regulated wetlands and the regulated 100′ adjacent area, and Federal ACOE regulated wetlands. The combined area of these environmental constraints was calculated and deducted from the Net Unprotected Acres in Study Area B.

(c) No infrastructure deduction was made for the limited development option of the proposed AB District because the sliding scale is a flat density calculation (rather than being based on minimum lot size), and the proposed Zoning does not require a deduction for infrastructure. Similarly, no infrastructure deduction was made for the sale of development rights in the AB District since the conservation option would not entail development of infrastructure.

(d) The AB District offers landowners the option to sell their development rights based on the minimum acreage requirements established for the parcel on the 1999 Zoning Map while retaining a number of farmstead dwelling units based on the parcel size (the "conservation option"), or to develop their lands based on a sliding scale (the "limited development option"). For the purposes of this build-out analysis it was assumed that development rights would be sold from 50% of the lands in the AB District, and 50% of the lands would be developed under the limited development option. To calculate this, the conservation option was calculated for <u>all</u> AB District parcels, and similarly, the limited development option was calculated for <u>all</u> AB District parcels. The resulting numbers were then divided in half. See Tables 2a and 2b on page 33.

(e) For the AB District conservation option it was assumed that landowners retain all of the permitted farmstead dwelling units. Since the retained dwelling units in the conservation option are deducted from the number of development rights, Table 2a identifies the total number of development rights available, the number of retained dwelling units, and the net development rights available for sale.

(f) The number of retained farmstead dwelling units was based on an analysis of the size of existing parcels in the proposed AB District, as follows: there are 99 parcels under 40 acres (yielding 99 retained du), 25 parcels 40-80 acres in size (yielding 50 retained du), and 21 parcels greater than 80 acres (yielding 63 retained du), for a total of 212 retained farmstead dwelling units.

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[10] The proposed Zoning would require a deduction for the Sawkill, Lakes Kill, Stony Kill and Mudder Kill and those adjacent land areas within 100′ of the high water mark, and the adjacent land areas within 50′ of the high water mark for all other streams. Since the GIS data does not differentiate between the Town's major streams and their tributaries, all streams were conservatively studied with a 60′ buffer.

(g) The number of dwellings that could be created under the limited development option in the proposed AB District was based on an analysis of the size of existing parcels, minus existing dwelling units as shown in Table 2b on page 33.

(h) The TND District allows developers an increase in building potential in exchange for funds to be used exclusively to purchase development rights from lands in the AB District. This is the mechanism for transferring building potential to lands that have been identified for development (i.e., "centers") from lands that have been identified for conservation (i.e., "greenspaces"). The build-out analysis of the TND Residential Subdistrict includes a calculation of the potential new lots that could be created as-of-right (1 du/acre), and the potential new lots that could be created through the use of incentive zoning. For the purpose of this analysis, it was assumed that the TND Residential Subdistrict would be fully built-out through incentive zoning.

(i) The TND District requires a residential mix of at least three different housing types, none less than 20%. For the purpose of this analysis, it was assumed that the TND Residential Subdistrict was built out with 60% TND Houses (detached single family dwellings greater than 1,200 sq. ft. in size), 20% TND Duplexes/ Apartments, and 20% TND Townhouses. Since larger single family detached dwellings have the greatest impacts, this assumption yields the most conservative analysis. Moreover, the five existing single family dwellings were analyzed as TND Houses.

(j) As discussed previously, many parcels in Study Area C are currently developed at their fullest permitted density. To yield the most accurate build-out calculation, fully developed parcels were not included in the build-out analysis. For the proposed action, lands in this area were studied as follows:

- For lands Zoned R1, the build-out analysis studied all parcels greater than 2 acre in size (excluding two parcels already developed as mobile home parks) since a minimum of 2 acres would be necessary for subdivision in the R1 District without the water bonus. See Figure 10.
- For lands Zoned R1.5, the build-out analysis studied all parcels greater than 3 acres in size since a minimum of 3 acres would be necessary for subdivision in the R1.5 District without the water bonus. See Figure 11.

The results of the above calculations are presented in Tables 2a, 2b, 2c, 2d, and 2e, and are summarized in Table 2f in Appendix A (pages 33 to 35).

Based on the assumption noted above, that development rights would be sold from 50% of the lands in the AB District, and 50% of the lands would be developed under the limited development option, the build-out analysis has found that the proposed AB

District (Study Area A) could yield 297 new single family dwelling units[11] and there would be 441 development rights for sale.

The build-out analysis has found that the proposed TND Residential Subdistrict (Study Area B) could accommodate 57 new dwelling units as-of-right, and 297 dwellings[12] using incentive zoning, a difference of 240 dwellings. Funds contributed by developers to build the additional 240 dwellings would be used to purchase development rights from lands in the proposed AB District. If, for example, the incentive zoning fee per unit was in the $20,000-$25,000 range, the additional 240 units would provide $4.8 million to $6 million for purchase of farmland development rights.

The build-out analysis has found that Study Area C could accommodate 324 new single family dwelling units if the water density were deleted as proposed.

The build-out analysis has found that Study Area D could accommodate 470 new single family dwelling units if the proposed Zoning amendments were adopted.

Thus the build-out analysis has found that **the proposed amendments would result in approximately 1,388 new dwelling units in the Study Area**. Currently, approximately 3,588 new dwelling units could be constructed in the Town. The proposed amendments would result in 2,200 fewer dwelling units, a 61 percent reduction. The following Table A summarizes the number of dwelling units that would be allowed in the Study Area under the current Zoning and the proposed Zoning amendments.

Table A: Comparison of New Dwellings Permitted Under Current Zoning and Proposed Zoning Amendments

	New Dwellings	
	Current Zoning	Proposed Zoning
Study Area A	1,420	297*
Study Area B	92	297**
Study Area C	1,037	324
Study Area D	1,039	470
TOTAL:	**3,588**	**1,388**

* 106 retained du + 191 potential new lots. Assumes that development rights would be sold from 50% of lands in the AB District under the "conservation option," and 50% of lands would be developed under the "limited development option." In addition to the dwelling units, there would be 441 development rights for sale.

**Including 149 TND Houses, 74 TND Townhouses, and 74 TND Duplex/Apartment units.

[11] Consisting of 106 retained dwelling units and 191 potential new lots.

[12] Including 149 TND Houses, 74 TND Townhouses, and 74 TND Duplex/Apartment units.

3. **Modification to the Conservation Option of the AB District (Alternative B)**

   (a) This alternative analyzes the impacts of the proposed amendments but with a modification to the conservation option of the AB District that permits a purchase of development rights density bonus of: a) 1 dwelling unit per 5 acres; b) 1 dwelling unit per 6 acres.

   (b) The methodology for the build-out analysis of this option is the same as for the conservation option in the proposed action with the following exception: acreage for the 104 existing dwelling units was deducted from the Buildable Acres at a rate of 1 du/5 acres and 1 du/6 acres for each of the two options studied. The remaining acreage was then divided by 5 and 6 respectively to calculate the number of development rights.

The results of the above calculations are presented in Tables 3a and 3b on page 35.

The build-out analysis has found that **if development rights could be sold at a rate of 1 development right per 5 acres, the conservation option of the AB District would yield 186 development rights for sale** (based on the assumptions herein). **If development rights could be sold at a rate of 1 development right per 6 acres, the conservation option of the AB District would yield 129 development rights for sale**. A comparison of the proposed action with these two alternatives is presented in Table B below.

4. **Modification to the Conservation Option of the AB District (Alternative C)**

   (a) This alternative analyzes the impacts of the proposed amendments but with a modification to the conservation option of the AB District that requires different deductions for environmental constraints and for infrastructure/inefficiencies in lot layout, as outlined below.

   (b) From the Net Unprotected Acres in the AB District, the combined area of the following environmental constraints was deducted:

      (i) State DEC regulated wetlands

      (ii) Federal ACOE regulated wetlands

   (c) A 6% deduction was made to account for necessary infrastructure (roads and drainage), and for inefficiencies in lot layout.

The results of the above calculations are presented in Table 4 on page 36. The build-out analysis has found that under this alternative **the conservation option of the AB District could yield 531 development rights for sale** (based on the assumptions herein). A comparison of the proposed action with this alternative is presented in Table B below.

Table B: Agricultural Business District, Conservation Option*		
	Retained DU	Development Rights
Proposed Action	106 du	441
Alternative B(a)	106 du	186
Alternative B(b)	106 du	129
Alternative C	106 du	531
* Assumes that development rights would be sold from 50% of lands in the AB District under the "conservation option," and 50% of lands would be developed under the "limited development option."		

5. Modification to Limited Development Option of the AB District (Alternative D)

(a) This alternative analyzes the impacts of the proposed amendments but with a modification that the limited development option of the AB District is calculated at: a) 1 dwelling unit per 10 acres; b) 1 dwelling unit per 6 acres.

(b) The methodology for the build-out analysis of this alternative was the same as for the limited development option in the proposed action.

The results of the above calculations are presented in Tables 5a and 5b in Appendix A (page 37). The build-out analysis has found that, based on the assumptions herein[13], calculating **the limited development option at 1 du/10 acres would yield 223 new dwelling units in the AB District,** and calculating **the limited development option at 1 du/6 acres would yield 406 new dwelling units.** A comparison of the proposed action with these alternatives is presented in Table C on page 12.

6. Modification to Limited Development Option of the AB District (Alternative E)

(a) This alternative analyzes the impacts of the proposed amendments but with a modification that the limited development option of the AB District is calculated as: 1 dwelling unit for parcels 0 to 6 acres in size; 2 dwelling units for parcels > 6 to 40 acres in size; 1 dwelling unit per 20 acres for parcels greater than 40 acres in size (all using conservation subdivision design).

(b) The methodology for the build-out analysis of this alternative was the same as for the limited development option in the proposed action.

The results of the above calculations are presented in Table 6 in Appendix A (page 36). The build-out analysis has found that under this alternative **the limited development option of the AB District would yield 124 new dwelling units in the AB District**. A comparison of the proposed action with this alternative is presented in Table C below.

[13] Assumes that development rights would be sold from 50% of lands in the AB District under the "conservation option," and 50% of lands would be developed under the "limited development option."

7. **Modification to Limited Development Option of the AB District (Alternative F)**

   (a) This alternative analyzes the impacts of the proposed amendments but with a modification that the limited development option of the AB District is calculated at 1 dwelling unit per 40 acres (using conventional subdivision).

   (b) The methodology for the build-out analysis of this alternative was to divide the Net Unprotected Acres by 40 (the acreage required for each dwelling unit) to determine the Total Lot Count. Existing dwelling units were then deducted to yield the Potential New Lots. Consistent with the previous analyses of the AB District, it was assumed that that development rights would be sold from 50% of the lands in the AB District, and 50% of the lands would be developed under the limited development option.

The results of the above calculations are presented in Table 7 in Appendix A (page 37). The build-out analysis has found that under this alternative, **the limited development option of the AB District would yield 16 new dwelling units in the AB District.** A comparison of the proposed action with this alternative is presented in Table C below.

Table C: Agricultural Business District, Limited Development Option*

	New Dwellings
Proposed Action	191 du
Alternative D(a)	223 du
Alternative D(b)	406 du
Alternative E	124 du
Alternative F	16 du

* Assumes that development rights would be sold from 50% of lands in the AB District under the "conservation option," and 50% of lands would be developed under the "limited development option."

8. **Modification to Limited Development Option of the AB District (Alternative G)**

   (1) This alternative analyzes the impacts of the proposed amendments but with a modification that the limited development option of the AB District is deleted.

   (2) The methodology for the build-out analysis of this alternative is the same as for the calculation of the conservation option of <u>all</u> lands in the AB District in the proposed action since no limited development option would exist under this alternative.

The results of the above calculations are the same as Table 2a on page 33. If the limited development option were deleted, the AB District would yield **212 new dwelling units (retained farmstead units) in the AB District and 882 development rights for sale.**

9. Modification to Building Potential in the TND District (Alternative H)

(1) This alternative analyzes the impacts of the proposed amendments but with a modification to Table 1 in § 143-49.1G of the proposed Zoning amendments (see below) that would increase development potential in TND Residential Subdistrict through incentive zoning as follows:

SECTION 143-49.1G--TABLE 1: MAXIMUM HOUSING EQUIVALENT UNITS PER ACRE		
	By Right	**By Incentive Zoning**
Residential Neighborhood Subdistrict	1 unit per net acre	TND House: 6 units per net acre TND Cottage and TND Duplex: 8 units per net acre TND Town house and TND Apartment: 12 units per net acre

(2) The methodology for the build-out analysis of this alternative is the same as for the calculation of the TND Residential Subdistricts in the proposed action.

The results of the above calculations are presented in Table 8 on page 37. The build-out analysis has found that under this alternative, **the TND District could accommodate** 57 dwelling units as-of-right, and **463 dwellings using incentive zoning**[14], a difference of 406 dwellings. Funds contributed by developers to build the additional 406 dwellings would be used to purchase development rights from lands in the AB District. If, for example, the incentive zoning fee per unit was in the $20,000-$25,000 range, the additional 406 units would provide $8.12 million to $10.15 million for purchase of farmland development rights, substantially more than the proposed action.

10. Modification to the TND District (Alternative I)

(1) This alternative analyzes the impacts of the proposed amendments but with a modification that the TND District and the Open Space Incentive Zoning provisions are deleted.

(2) The methodology for the build-out analysis of this alternative is the same as for the calculation of the proposed amendments for Study Area C.[15]

The results of the above calculations are presented in Table 9 on page 37. The build-out analysis has found that under this alternative, **lands in Study Area B would accommodate 40 new dwelling units** if these lands were not Zoned TND District and were treated similarly to the other R1 and R1.5 lands in the Town, with the water bonus deleted. It should be noted that under this alternative, the Town would not convert the

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[14] 220 TND Houses, 146 TND Townhouses, and 97 TND Duplex/Apartment units.

[15] I.e., the same environmental constraints were deducted (DEC regulated wetlands and the regulated 100′ adjacent area, ACOE regulated wetlands, FEMA 100-year floodplains, streams with a 60′ buffer, waterbodies with a 50′ buffer, and steep slopes 20% and greater), a 10% deduction was made for infrastructure, and the water density bonus was deleted since lands in Study Area B under this alternative would remain Zoned R1 and R1.5.

existing zoning into a mixed-use TND neighborhood with significantly more commercial and economic development potential, as well as the additional residential units. The Town would also not receive any funds contributed by developers for the purchase of development rights from lands in the proposed AB District.

Table D below summarizes the results of the build-out analysis.

Table D: Summary of Build-out Analysis		
Alternative	**New Dwellings**	**Development Rights**
Current Zoning (Alternative A)	3,588**	--
Proposed Action*	1,388***	441
Alternative B(a)*	1,388***	186
Alternative B(b)*	1,388***	129
Alternative C*	1.388***	531
Alternative D(a)*	1,420***	441
Alternative D(b)*	1,603***	441
Alternative E*	1,321***	441
Alternative F*	1,213***	441
Alternative G	1,197***	882
Alternative H*	1,554****	441
Alternative I*	1,131**	441
* Assumes that in the proposed AB District, development rights would be sold from 50% of lands under the "conservation option," and 50% of lands would be developed under the "limited development option."		
** All single family units.		
*** Includes 149 TND houses, 74 townhouses and 74 duplex/apartment units. The remaining units are single family.		
**** Includes 220 TND houses, 146 townhouses and 97 duplex/apartment units. The remaining units are single family.		

Potential Impacts of the Build-out Analysis

The build out analysis was next subjected to an impact assessment. The analysis illustrates the potential impacts of the current Zoning Law, the proposed action, and the various alternatives that were studied. The analysis helps measure the long-range effectiveness of the different Zoning scenarios, and allows for a visualization of the patterns of growth. In preparing the impact assessment, the following assumptions were made:

1. Total new residents and school age children are based upon multipliers provided by Fairweather Consulting as shown in Table E below.

Table E: Population and Student Multipliers				
Housing Unit Size/ Type	**Percentage of Existing Units (TOV area)**	**Percentage of Existing Units (Villages)**	**Population Multiplier*+**	**Student Multiplier* +**
Single Family Homes				
2BR	24.10%	47.48%	2.31	0.3
3BR	49.03%	38.41%	3.06	0.71
4BR	20.68%	9.95%	3.76	1.16
5BR	6.20%	4.16%	4.52	1.58
Townhomes				
2BR	*	47.48%	2.16	0.22
3BR	*	38.41%	3.08	0.62
4BR	*	14.11%	3.83	1.19
Duplexes/Apartments				
1BR	*	20.15%	2.2	0.3
2BR	*	27.33%	2.58	0.49
3BR	*	52.52%	3.73	1.04
** Based on Census data and recent sales, substantially all of the housing units in the TOV area are Single Family Detached Homes.*				
+ Source: Rutgers University Center for Urban Policy Research				

2. Additional vehicles on the roads were estimated at 2 per unit. According to the 2000 US Census, there was an average of 2 cars per household for owner occupied units.

3. Additional vehicle trips per day were estimated at 9.57 per unit based upon the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 7th Edition (2003) for single family homes (ITE Land Use Code #210). Since the TND District requires a minimum of 3 housing types, none less than 20%, the TND District was assumed to be built out with 60% TND Houses (9.57 trips/unit), 20% TND Townhouses (5.86 trips/unit[16]), and 20% TND Duplex/Apartment units (6.59 trips/unit[17]). Under the ITE standards, these generated the greatest number of trips.

[16] ITE Land Use Code #230

[17] ITE Land Use Code #221. The ITE *Trip Generation Manual* does not provide trip generation rates for duplexes, so the land use code for low-rise apartments was used.

ITE's methodology, by their own admission, is designed "for single-use developments where virtually all access is by private automobile."[18] A recent article in *New Urban News* (September 2008) entitled "Studies: Mixed-use Walkable Development Alleviates Traffic" cites three studies currently being conducted to determine actual trip generation rates of mixed-use neighborhoods, which are anticipated to generate fewer trips than the ITE manual suggests. One of the studies, conducted by Reid Ewing at the National Center for Smart Growth Research and Education at the University of Maryland, found that "mixed use developments generate substantially less vehicular traffic than conventional single-use projects" (Ibid., page 7). *Greenway Connections* similarly notes that "since over one-third of auto trips are for local errands, car use can be reduced by 18 to 25 percent in well planned, mixed use areas" (*Greenway Connections,* page 11). The ITE is currently in the process of updating its *Trip Generation Manual* to include trip generation rates for mixed-use developments, which are anticipated to generate significantly fewer trips than conventional suburban auto-dependent developments. Currently, the ITE's only available data indicates trip generation rates ranging from 2% to 20% less for mixed use development, depending on their features.[19] A modest 15% reduction in trip generation rates was applied in this build-out study for the proposed TND District; actual trip generation rates for this District would likely be much lower.

4. Additional police protection was estimated at two (2) full-time police officers per 1,000 population based upon the commonly applied planning standard outlined in *Community Guide to Development Impact Analysis* by Mary M. Edwards, dated March 2000.

5. Additional fire protection was estimated at 1.65 fire fighters per 1,000 population based upon the standards of the International Association of Fire Chiefs.

6. Additional water consumed (gallons per day or gpd) and additional sewage generated (gpd) was based upon the NYS DEC *Design Standards for Wastewater Treatment Works* of 320 gpd for a 3 bedroom single family home (400 gpd minus 20% for water saving features), and 260 gpd for a 2.5 bedroom townhouse or duplex/apartment unit (325 gpd minus 20% for water saving features).

Results of the Build-out Analysis and Potential Impacts

The build-out analysis indicates that the current Zoning would permit the development of 3,588 new single family dwelling units in the Study Area. The impact of this build-out would be an increase in the Town's population of 11,089 new residents including an additional 2,479 school age children, an additional 7,176 vehicles making 34,337 additional vehicle trips per day on local roads, an additional 1,148,160 gallons of water consumed and an equal amount of sewage to be disposed of per day, and the need to

[18] ITE *Trip Generation Handbook*, 2nd Edition, (June 2004), Appendix B, page 121.

[19] Ibid.

add 22 new police officers and 18 new firefighters. There are currently 1,128 dwellings in the Study Area[20], and in 2008 the Town's population was approximately 8,455 persons.[21]

In comparison, if the existing Zoning were amended as proposed, the total number of dwelling units, population, school-aged children and infrastructure impacts would be reduced as compared to the above figures as follows: there would be potentially 1,388 new dwelling units and 4,226 new residents, including 940 children needing to go to school, an additional 2,776 vehicles making 12,436 additional vehicle trips per day on local roads, an additional 435,280 gallons of water per day consumed, and the need to add 8 new police officers and 7 new firefighters.

If the Town does nothing to refine its current planning and zoning practices, the consequences will likely take the form of the build-out analysis results described in this report. Table F summarizes the results of the current zoning, the proposed action, and the various alternatives analyzed.

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[20] There are an additional 1,090 dwelling units on lands in Study Areas C and D which were not included in the build-out analysis since the lots are already fully developed; see discussion on pages 5 - 6.

[21] Source: US Census Bureau estimate for 2008. The Town population cited here does not include the two Villages.

Table F: Comparison of Potential Impacts of Different Zoning Scenarios

	New Dwellings	Additional Residents	Additional School Children	Additional Vehicles on Roads	Additional Vehicle Trips Per Day (tpd)	New Police Officers	New Fire Fighters	Additional Water Consumed (gpd)	Additional Sewage Generated (gpd)
Current Zoning (Alternative A)	3,588	11,089	2,479	7,176	34,337	22	18	1,148,160	1,148,160
Proposed Action	1,388	4,226	940	2,776	12,436	8	7	435,280	435,280
Alternative B(a)	1,388	4,226	940	2,776	12,436	8	7	435,280	435,280
Alternative B(b)	1,388	4,226	940	2,776	12,436	8	7	435,280	435,280
Alternative C	1,388	4,226	940	2,776	12,436	8	7	435,280	435,280
Alternative D(a)	1,420	4,325	962	2,840	12,743	8	7	445,520	445,520
Alternative D(b)	1,603	4,891	1,089	3,206	14,494	10	8	504,080	504,080
Alternative E	1,321	4,019	894	2,642	11,795	8	7	413,840	413,840
Alternative F	1,213	3,685	819	2,426	10,762	7	6	379,280	379,280
Alternative G	1,197	3,963	881	2,394	10,609	8	7	374,160	374,160
Alternative H	1,554	4,696	1,042	3,108	13,140	9	8	482,700	482,700
Alternative I	1,131	3,485	775	2,262	10,823	7	6	361,920	361,920

FIGURES

Figure 1: Build-out Study Area, Town of Red Hook

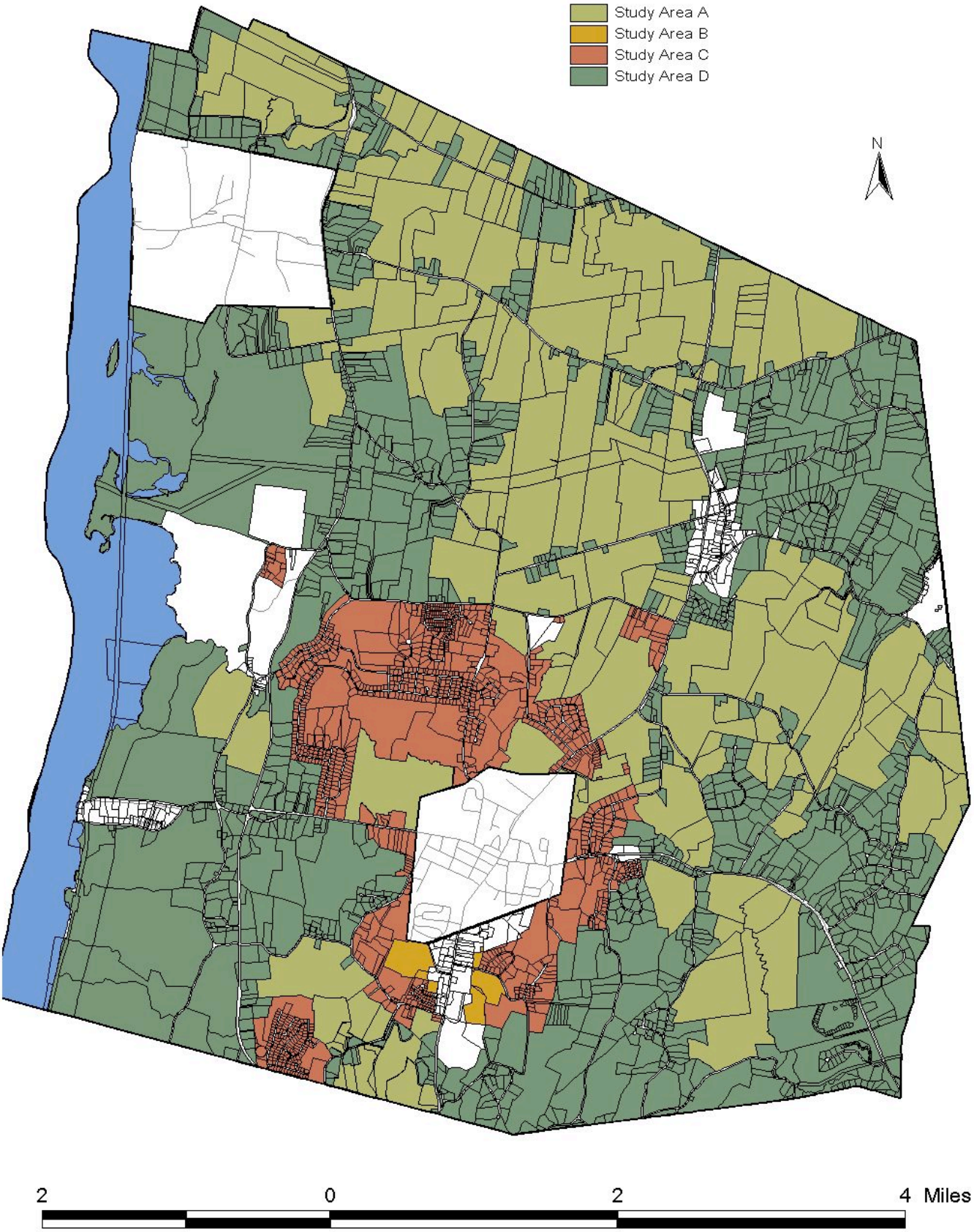


Figure 2: Easement Protected and Public Lands

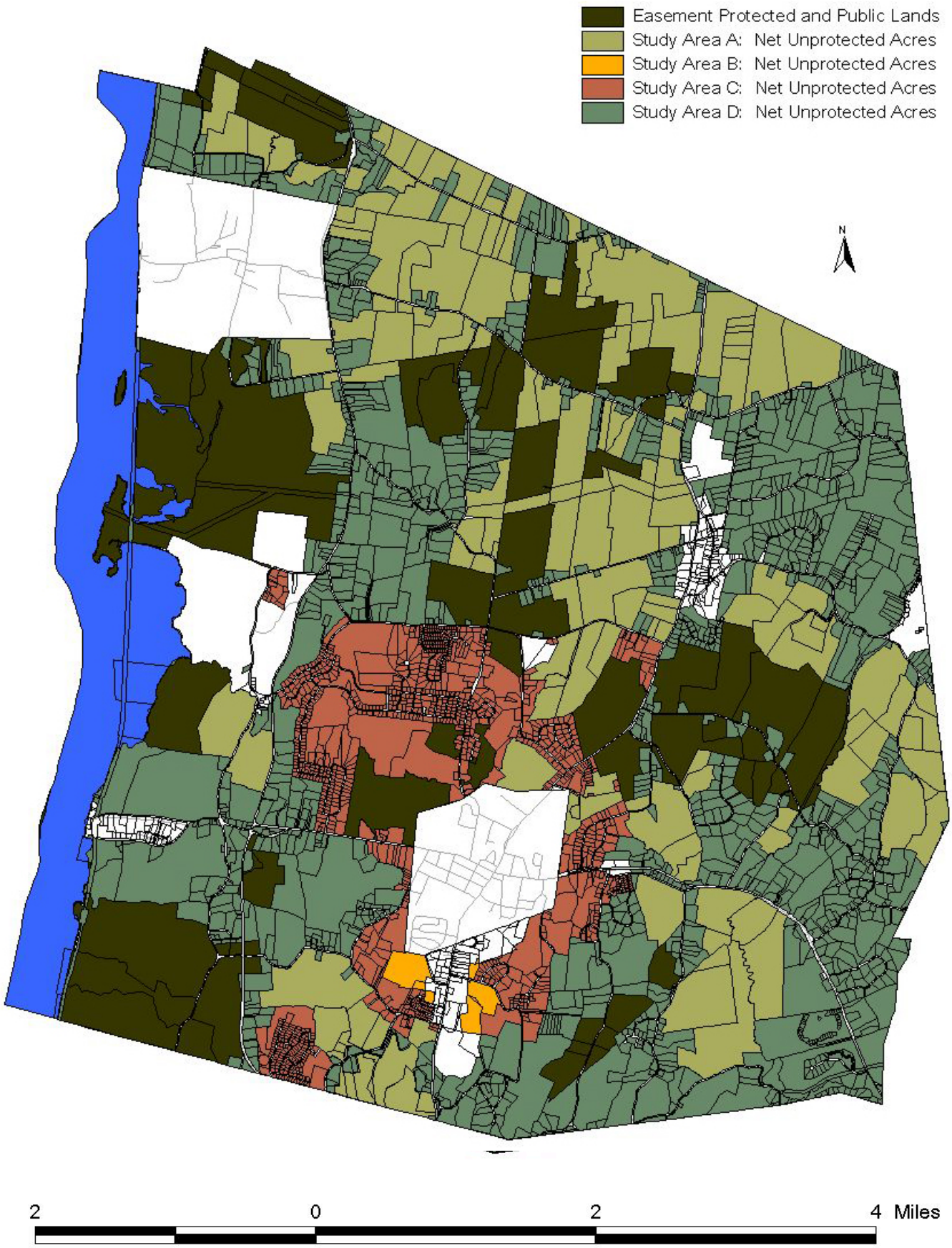


Figure 3: Current Zoning Districts, Study Area A

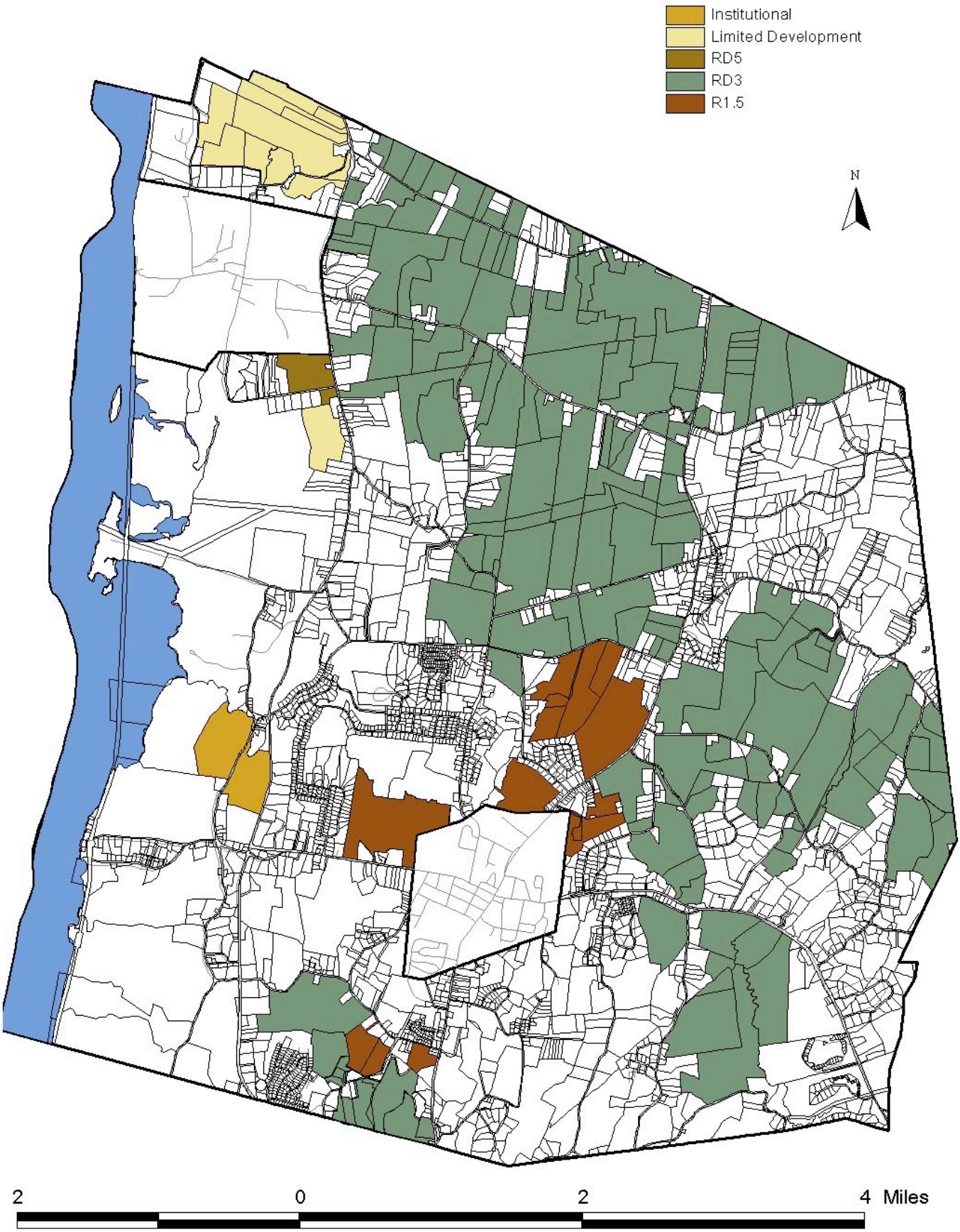


Figure 4: Current Zoning Districts, Study Area B

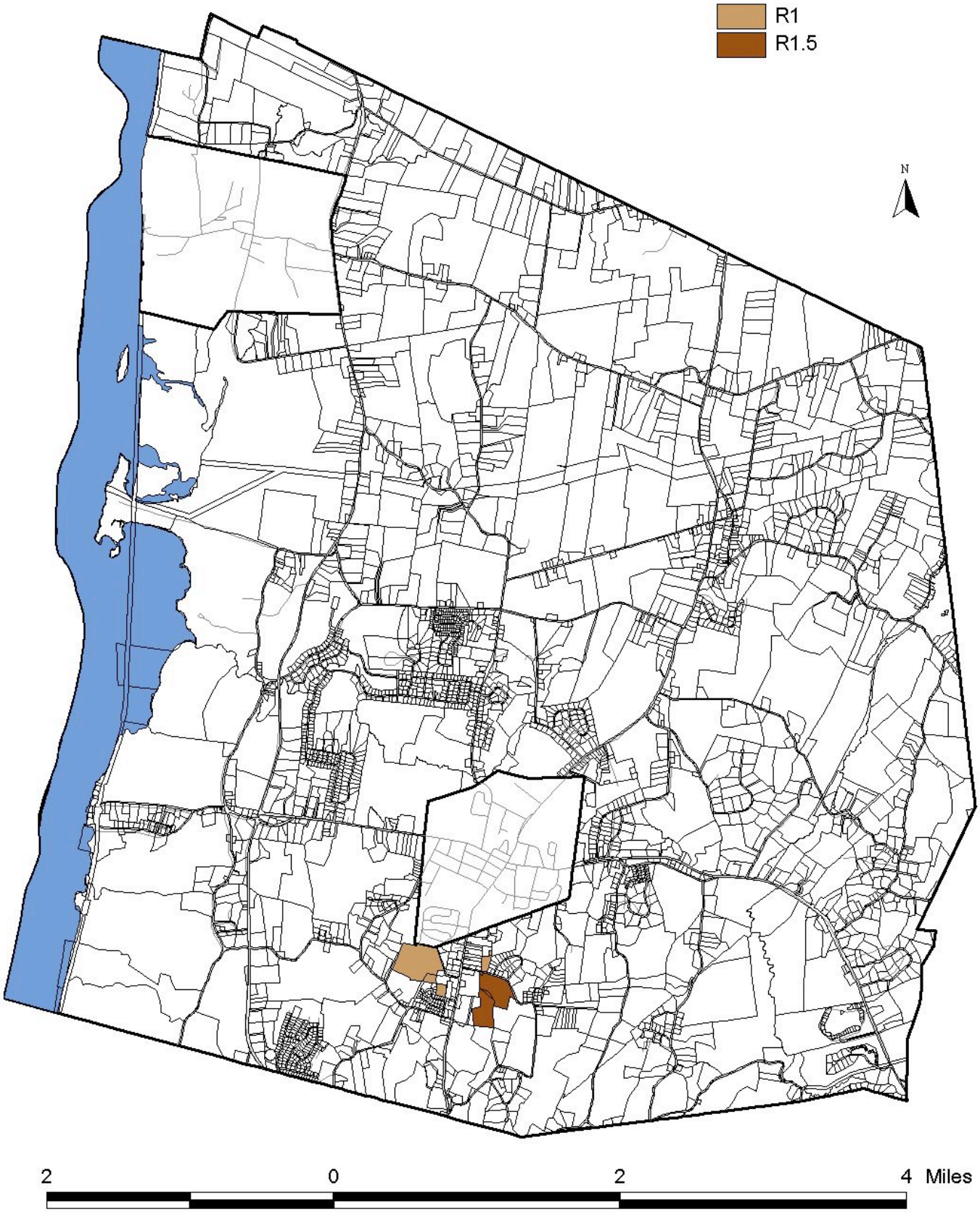


Figure 5: Current Zoning Districts, Study Area C

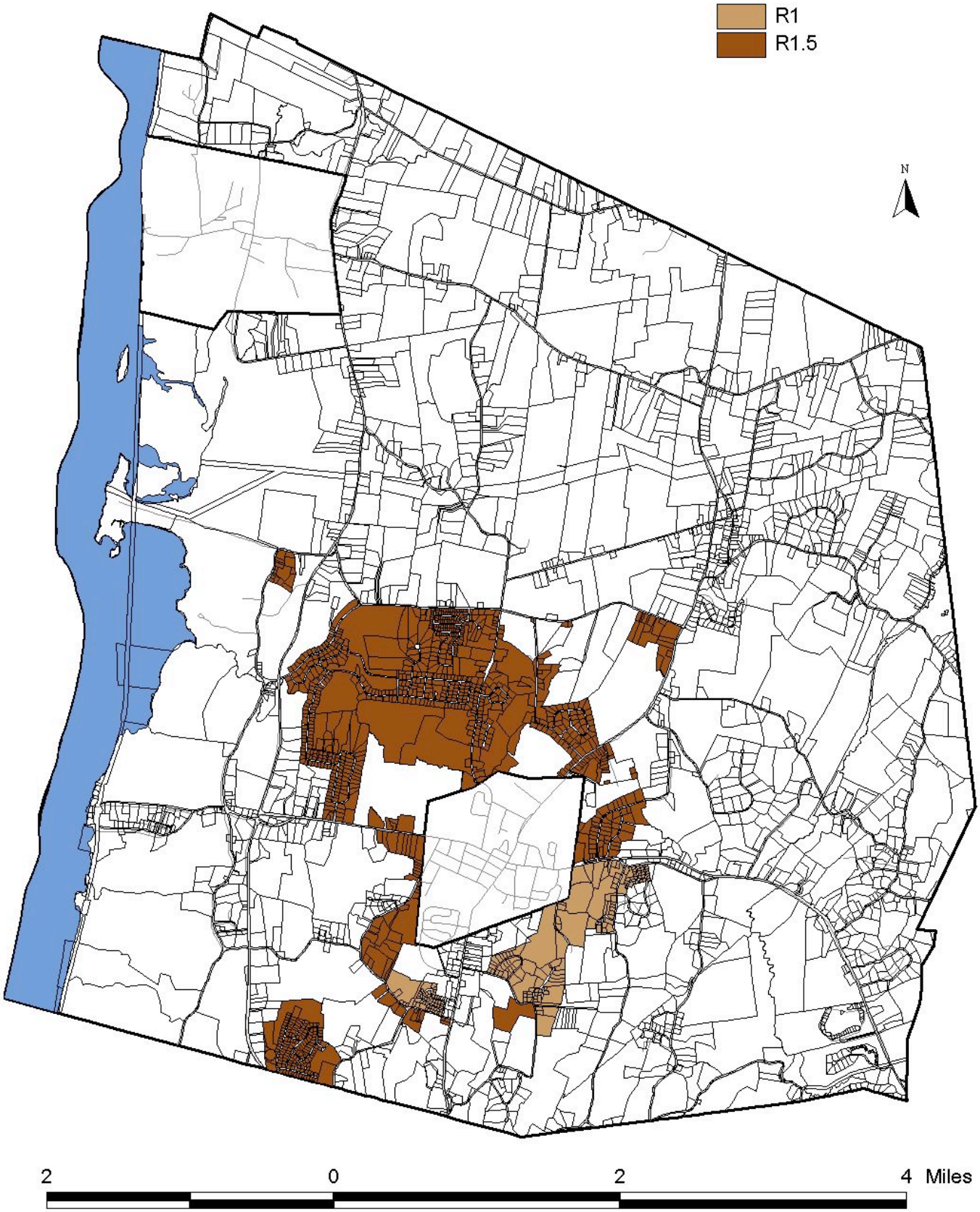


Figure 6: Current Zoning Districts, Study Area D

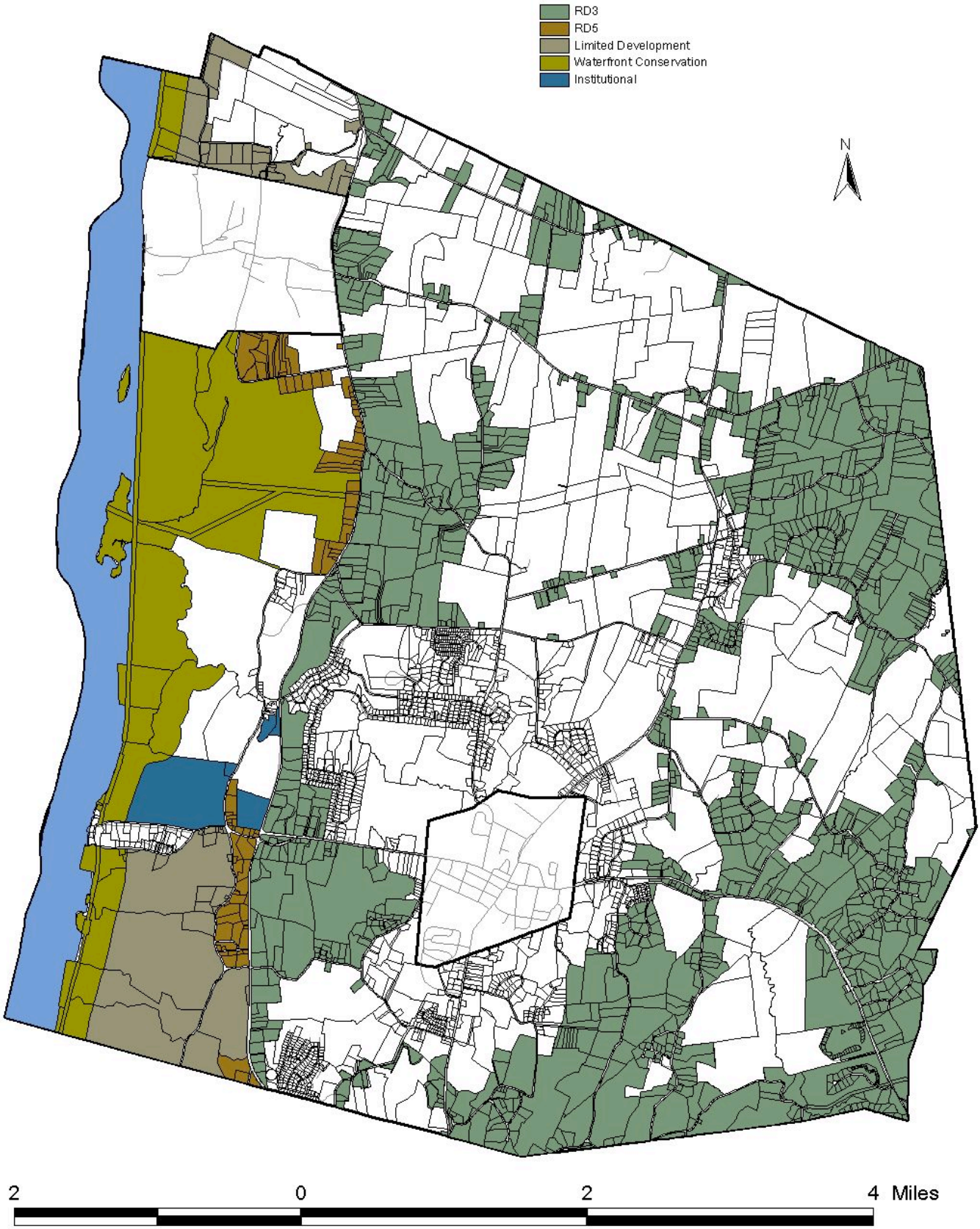


Figure 7: Study Area C, Parcels 1 Acre and Greater in R1 District

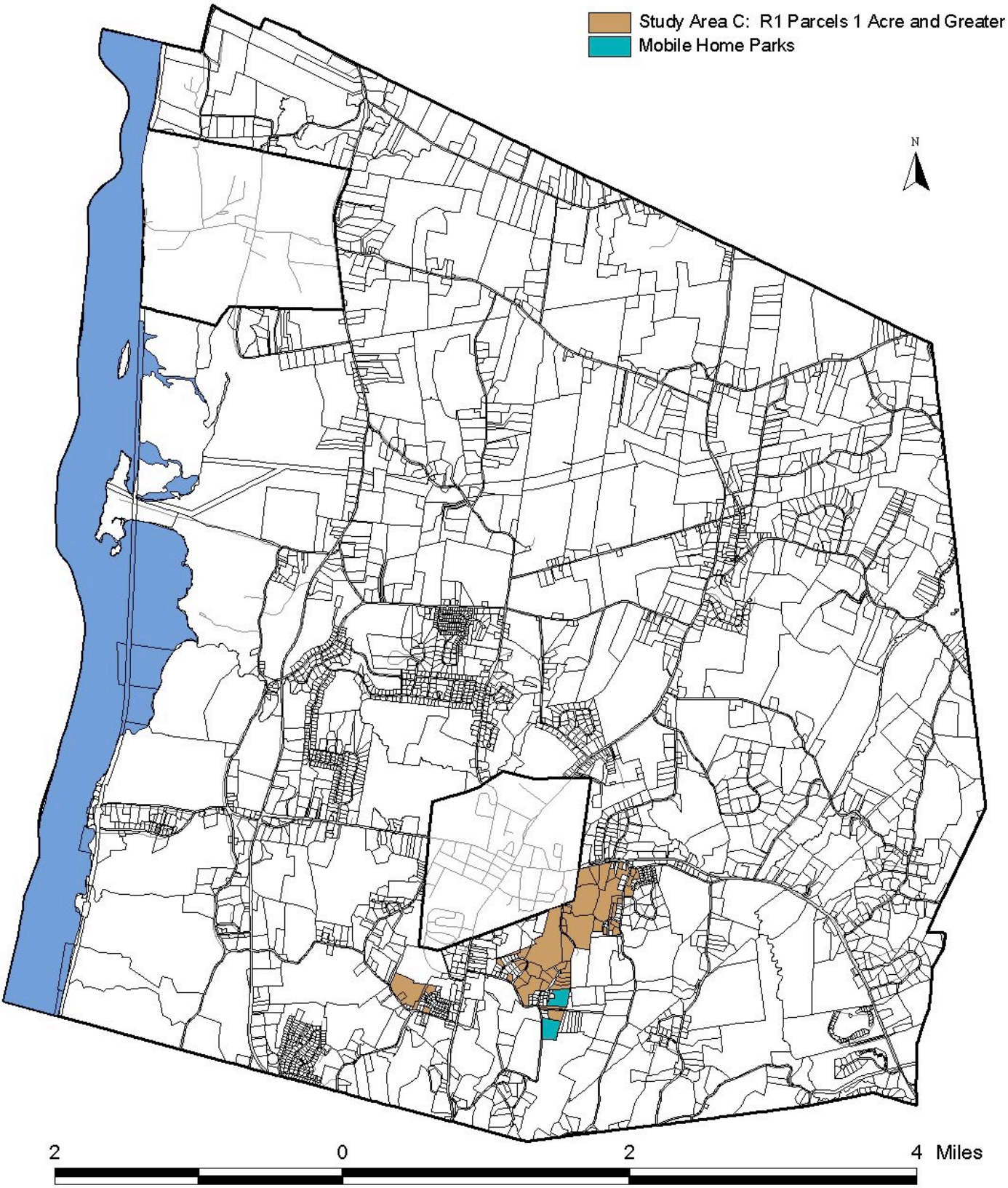


Figure 8: Study Area C, Parcels 2 Acres and Greater in R1.5 District

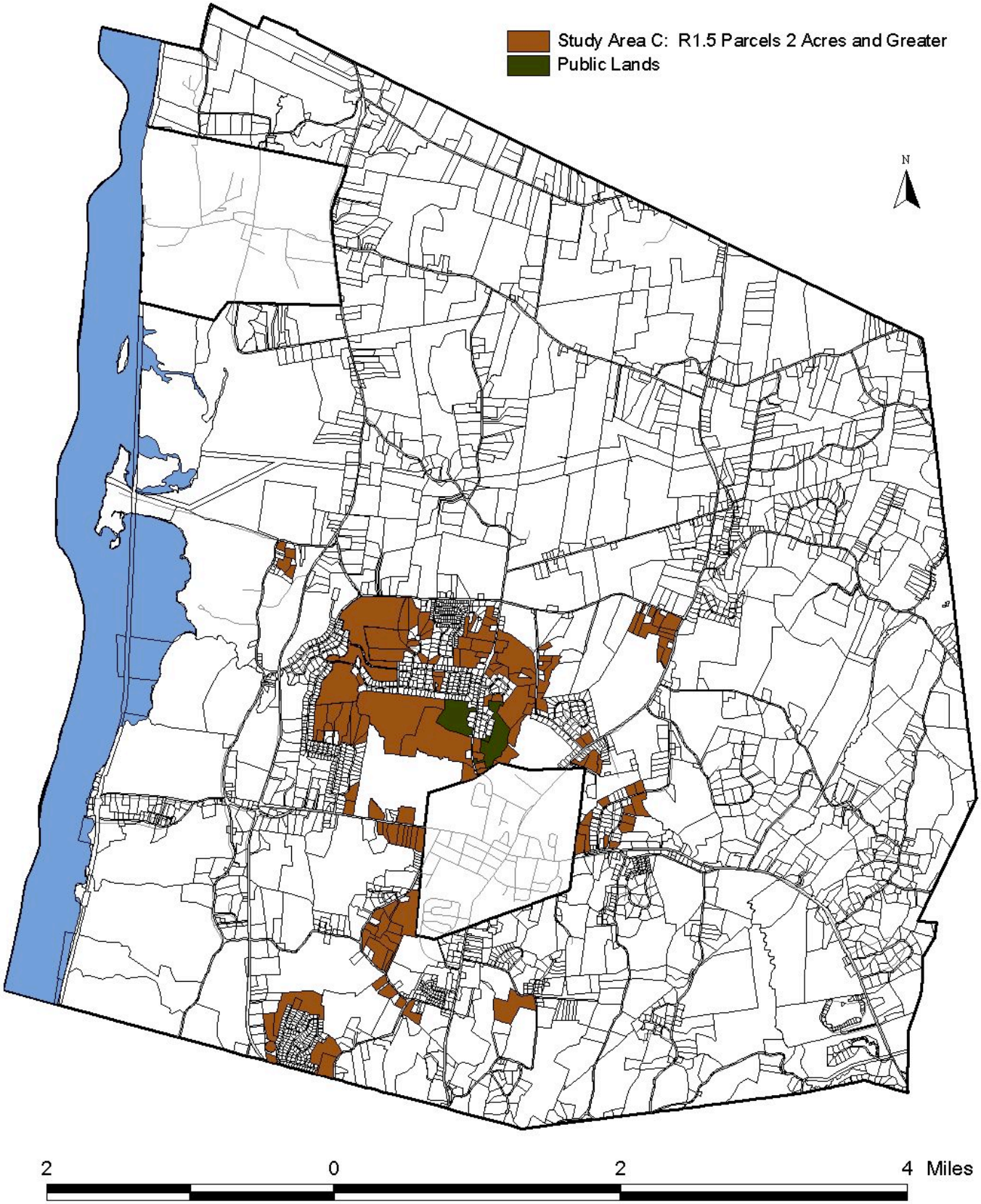


Figure 9: Study Area D, Undeveloped Parcels and Parcels 10 Acres and Greater in RD5/LD Districts

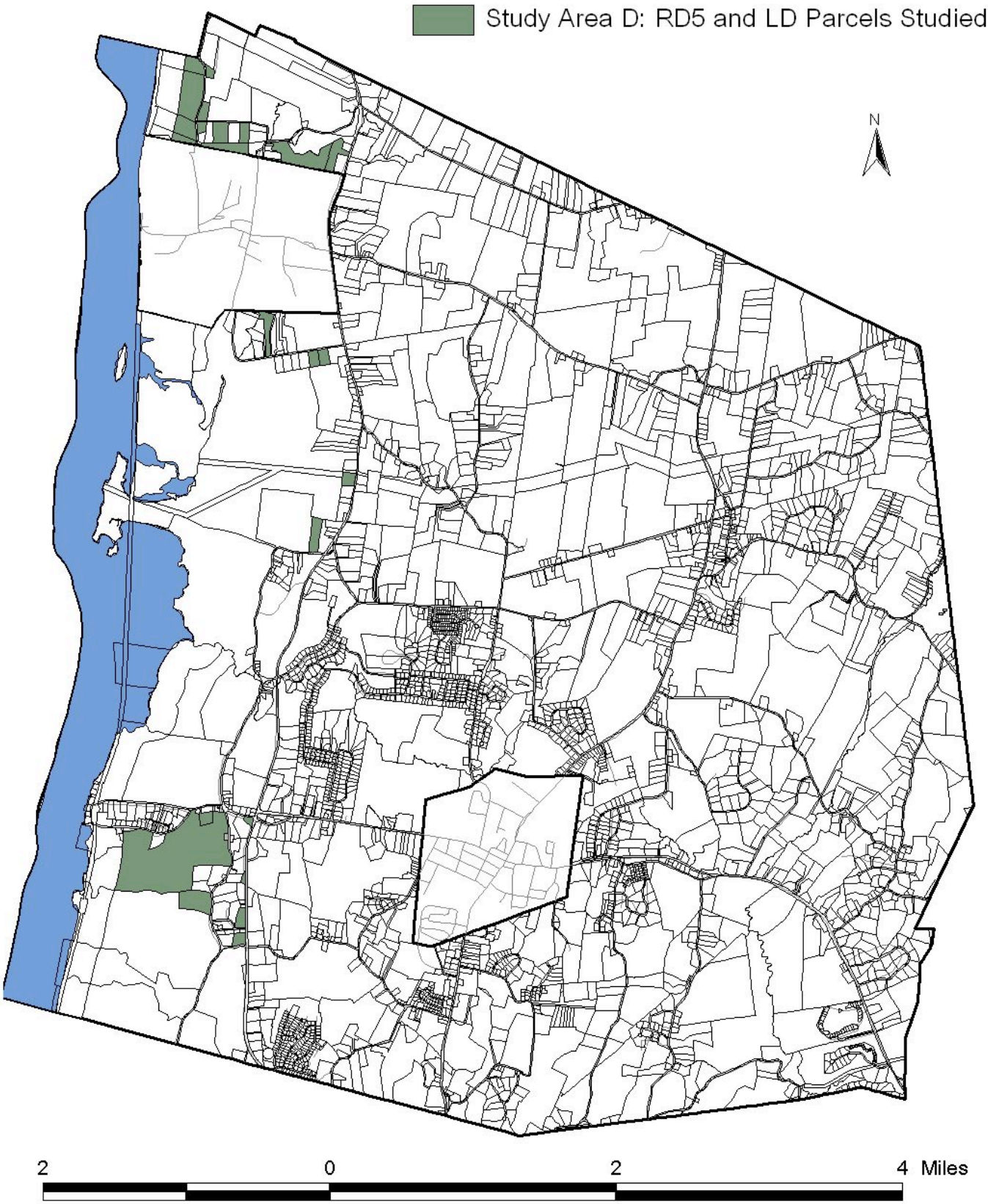


Figure 10: Study Area C, Parcels 2 Acres and Greater in R1 District

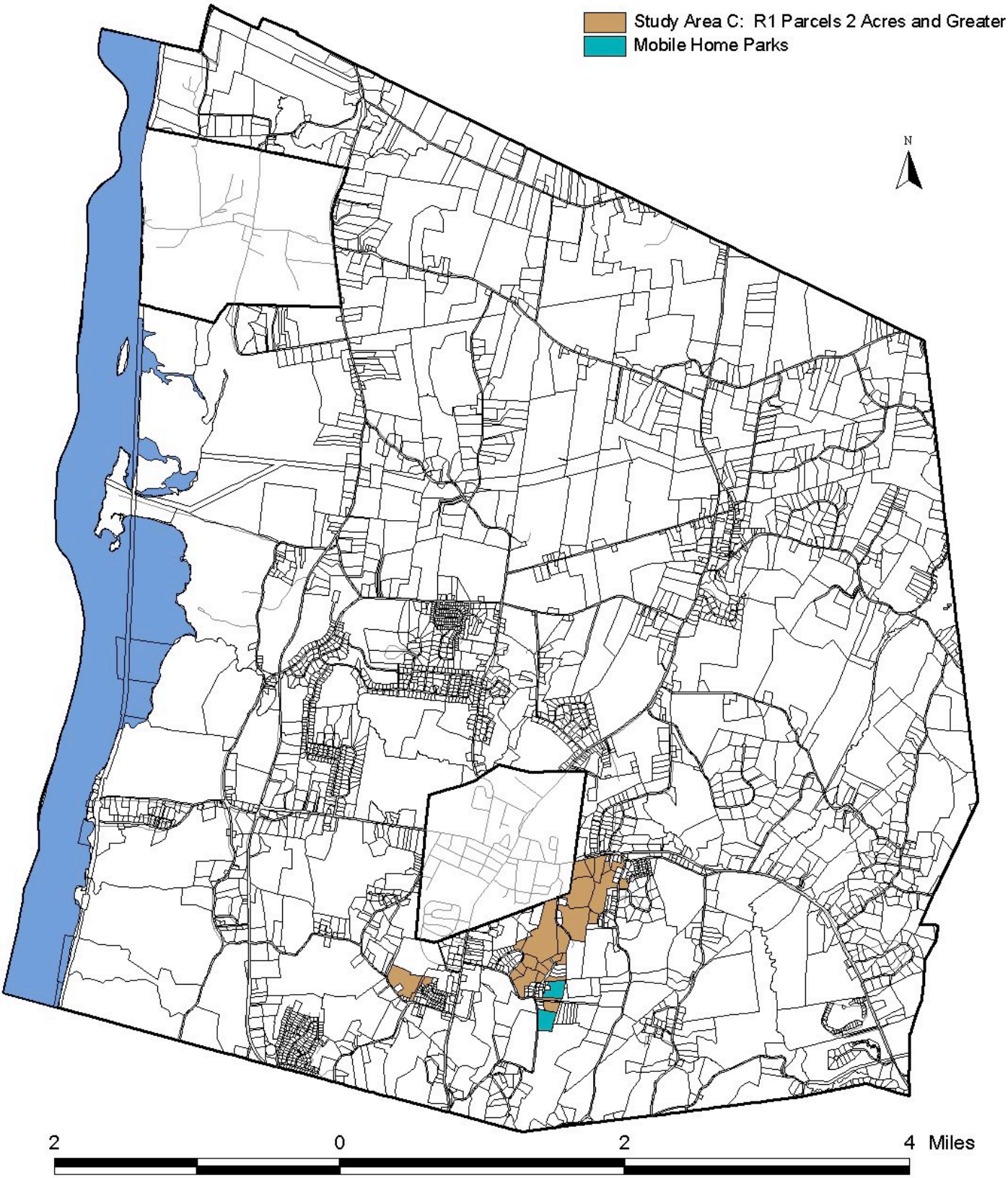
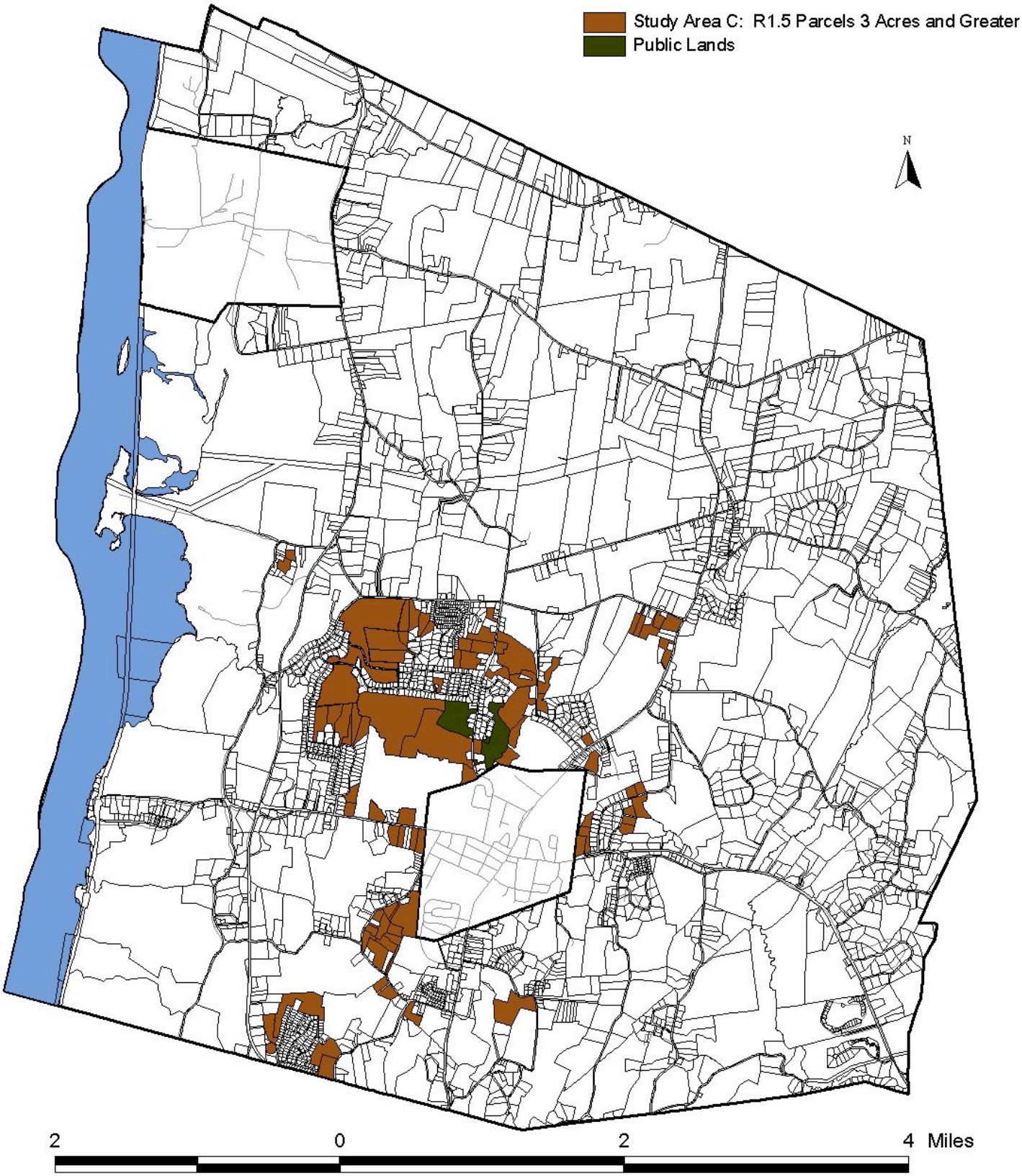


Figure 11: Study Area C, Parcels 3 Acres and Greater in R1.5 District



APPENDIX A: TABLES

Appendix A: Build-out Analysis

Table 1: Current Zoning (No Action Alternative)

A	B	C	D	E	F	G	H	I	J	K
Zoning District	Gross Acreage	Public/ Easement Protected Acreage	Net Unprotected Acres	Combined Constraints (acres)	Net Developable Acres	Adjust Infra-structure	Buildable Acres	Total Lot Count	Existing DU	Potential New Lots
Study Area A:										
LD	463	232	231	17	214	9	205	41	3	38
RD5	61	0	61	1	60	2	58	11	0	11
RD3	6578	1901	4677	902	3775	291	3494	1164	94	1070
R1.5	678	312	366	49	317	37	280	280	3	277
I	162	0	162	13	149	6	143	28	4	24
	Subtotal:									1420
Study Area B:										
R1	53	0	53	18	35	5	30	60	4	56
R1.5	43	0	43	2	41	4	37	37	1	36
	Subtotal:									92
Study Area C:										
R1*	250	0	250	16	234	25	209	418	16	402
R1.5**	992	0	992	163	829	99	730	730	95	635
	Subtotal:									1037
Study Area D:										
RD3	6877	268	6609	749	5860	397	5463	1821	870	951
RD5/LD/I***	1313	726	587	32	555	23	532	106	28	78
WC****	1896	1715	181	20	161	4	157	16	6	10
	Subtotal:									1039
TOTALS:	19366	5154	14212	1982	12230	902	11338	4712	1124	3588

* Includes all parcels greater than 1 acre in size (excluding two parcels already developed as mobile home parks). A minimum of 1 acre would be necessary for subdivision in the R1 District with the water bonus, which would permit 1 du per 1/2 acre.

** Includes all parcels greater than 2 acres in size (excluding two Town recreation parcels). A minimum of 2 acres would be necessary for subdivision in the R1.5 District with the water bonus, which would permit 1 du per 1 acre.

*** Includes all undeveloped parcels and all parcels greater than 10 acres in size. Does not include educational uses (Bard College).

**** Does not include educational uses (Bard College).

Table 2a: Proposed Action, Conservation Option of All AB District Parcels

A	B	C	D	E	F	G	H	I	
Zoning District	Gross Acreage	Public/ Easement Protected Acreage	Net Unprotected Acres	Combined Constraints (acres)	Net Developable Acres	Existing DU	Total Develop. Rights	Summary	
								Retained DU	Net Develop. Rights
Study Area A (Proposed ABD):									
LD	463	232	231	50	181	3	33	9	24
RD5	61	0	61	10	51	0	10	3	7
RD3	6578	1901	4677	1891	2786	94	835	183	652
R1.5	678	312	366	66	300	3	197	14	183
I	162	0	162	45	117	4	19	3	16
TOTALS:	**7942**	**2445**	**5497**	**2062**	**3435**	**104**	**1094**	**212**	**882**
							50% of this =	**106**	**441**

Table 2b: Proposed Action, Limited Development of All ABD Parcels

A	B	C	D	E	F
Parcel Size	Permitted Density	Number of Parcels	Total Lot Count	Existing DU	Potential New Lots
0 to 6 acres	1 du/parcel	6	6	1	5
> 6 to 20 acres	2 du/parcel	52	104	25	79
> 20 to 40 acres	3 du/parcel	41	123	38	85
> 40 to 60 acres	4 du /parcel	18	72	8	64
> 60 to 80 acres	5 du /parcel	7	35	2	33
> 80 to 100 acres	6 du /parcel	11	66	12	54
> 100 to 120 acres	7 du /parcel	6	42	11	31
> 120 to 140 acres	8 du /parcel	0	0	0	0
> 140 to 160 acres	9 du /parcel	2	18	1	17
> 160 to 180 acres	10 du /parcel	2	20	6	14
TOTALS:	**NA**	**145**	**486**	**104**	**382**
				50% of this =	**191**

Table 2c: Proposed Action, Study Area B

A	B	C	D	E	F	G	H	I	J	
Zoning District	Gross Acreage	Public/ Easement Protected Acreage	Net Unprotected Acres	Combined Constraints (acres)	Net Developable Acres	Adjust Infra-structure	Buildable Acres	Existing DU	Potential New Lots	
									By Right	Incentive
TND Residential Subdistrict	96	0	96	24	72	10	62	5	57	297* (240 incentive units)

* Includes 149 TND Houses, 74 TND Townhouses, and 74 TND Duplex/Apartment units.

Table 2d: Proposed Action, Study Area C

A	B	C	D	E	F	G	H	I	J	K
Zoning District	Gross Acreage	Public/ Easement Protected Acreage	Net Unprotected Acres	Combined Constraints (acres)	Net Developable Acres	Adjust Infra-structure	Buildable Acres	Total Lot Count	Existing DU	Potential New Lots
R1*	216	0	216	83	133	22	111	111	16	95
R1.5**	886	0	886	366	520	88	432	288	59	229
TOTAL:										324

* Includes all parcels 2 acres and greater (excluding two parcels already developed as mobile home parks). A minimum of 2 acres would be necessary for subdivision in the 1 acre district without the water bonus.

** Includes all parcels 3 acres and greater (excluding Town recreation lands). A minimum of 3 acres would be necessary for subdivision in the R1.5 District without the water bonus.

Table 2e: Proposed Action, Study Area D

A	B	C	D	E	F	G	H	I	J	K
Zoning District	Gross Acreage	Public/ Easement Protected Acreage	Net Unprotected Acres	Combined Constraints (acres)	Net Developable Acres	Adjust Infra-structure	Buildable Acres	Total Lot Count	Existing DU	Potential New Lots
RD3	6,877	268	6609	2373	4236	397	3839	1280	870	409
LD/RD5/I*	1,313	726	587	141	445	23	422	84	28	56
WC**	1,896	1715	181	68	113	4	109	11	6	5
TOTAL:										470

* Includes all undeveloped parcels and all parcels greater than 10 acres in size. Does not include educational uses (Bard College).

** Does not include educational uses (Bard College).

Table 2f: Proposed Action, Total Dwelling Units

Zoning District	Potential New Lots
Study Area A (AB District)	297*
Study Area B (TND Res. Subdistrict)	297**
Study Area C	324
Study Area D	470
TOTAL:	1,388

* 106 retained du + 191 potential new lots. Assumes that development rights would be sold from 50% of lands in the AB District under the "conservation option," and 50% of lands would be developed under the "limited development option."

**Including 149 TND Houses, 74 TND Townhouses, and 74 TND Duplex/Apartment units.

Table 3a: Alternative B(a), Conservation Option of All AB District Parcels 1 du/5 acres

A	B	C	D	E	F	G	H	I	
Zoning District	Gross Acreage	Public/ Easement Protected Acreage	Net Unprotected Acres	Combined Constraints (acres)	Net Developable Acres	Existing DU	Total Develop. Rights	Summary	
								# Retained DU	Net Devel. Rights
Study Area A (Proposed ABD):	7942	2445	5497	2062	3435	104	583	212	371
							50% of this =	106	186

Table 3b: Alternative B(b), Conservation Option of All AB District Parcels 1 du/6 acres

A	B	C	D	E	F	G	H	I	
Zoning District	Gross Acreage	Public/ Easement Protected Acreage	Net Unprotected Acres	Combined Constraints (acres)	Net Developable Acres	Existing DU	Total Develop. Rights	Summary	
								# Retained DU	Net Devel. Rights
Study Area A (Proposed ABD)	7942	2445	5497	2062	3435	104	469	212	257
							50% of this =	106	129

Table 4: Alternative C, Conservation Option of All ABD District Parcels, Different Constraints

A	B	C	D	E	F	G	H	I	J	K	
Zoning District	Gross Acreage	Public/ Easement Protected Acreage	Net Unprotected Acres	Combined Constraints (acres)	Net Developable Acres	Adjust Infra-structure	Buildable Acres	Existing DU	Total Develop. Rights	Summary	
										# Retained DU	Net Devel. Rights
Study Area A (Proposed ABD):											
LD	463	232	231	6	225	14	211	3	39	9	30
RD5	61	0	61	0	61	4	57	0	11	3	8
RD3	6578	1901	4677	1141	3536	281	3255	94	991	183	808
R1.5	678	312	366	29	337	22	315	3	207	14	193
I	162	0	162	2	160	10	150	4	26	3	23
TOTALS:	**7942**	**2445**	**5497**	**1178**	**4319**	**331**	**3988**	**104**	**1274**	**212**	**1062**
									50% of this =	**106**	**531**

Table 5a: Alternative D(a), Limited Development of all ABD Parcels at 1 DU per 10 acres

A	B	C	D
Net Unprotected Acres	Total Lot Count	Existing Du	Potential New Lots
5,497	550	104	**446**
		50% of this =	**223**

Table 5b: Alternative D(b), Limited Development of all ABD Parcels at 1 DU per 6 acres

A	B	C	D
Net Unprotected Acres	Total Lot Count	Existing Du	Potential New Lots
5,497	916	104	**812**
		50% of this =	**406**

Table 6: Alternative E, Limited Development of All ABD Parcels, Sliding Scale

A	B	C	D	E	F
Parcel Size	Permitted Density	Number of Parcels	Total Lot Count	Existing DU	Potential New Lots
0 to 6 acres	1 du/parcel	6	6	1	5
> 6 to 60 acres	2 du/parcel	111	222	71	151
> 60 to 80 acres	3 du/parcel	7	21	2	19
> 80 to 100 acres	4 du/parcel	11	44	12	32
> 100 to 120 acres	5 du/parcel	6	30	11	19
> 120 to 140 acres	6 du/parcel	0	0	0	0
> 140 to 160 acres	7 du/parcel	2	14	1	13
> 160 to 180 acres	8 du/parcel	2	16	6	10
TOTALS:		**145**	**353**	**104**	**249**
				50% of this =	**124**

Table 7: Alternative F, Limited Development of all ABD Parcels, 40 acres/du

A	B	C	D
Net Unprotected Acres	Total Lot Count	Existing Du	Potential New Lots
5,497	137	104	**33**
		50% of this =	**16**

Table 8: Alternative H: Increased Building Potential in TND

A	B	C	D	E	F	G	H	I	J	
Zoning District	Gross Acreage	Public/ Easement Protected Acreage	Net Unprotected Acres	Combined Constraints (acres)	Net Developable Acres	Adjust Infra-structure	Buildable Acres	Existing DU	Potential New Lots	
									By right	Incentive
Study Area B (TND Residential Subdistrict)	96	0	96	24	72	10	62	5	57	463* (406 incentive units)

*** Includes 220 TND Houses, 146 TND Townhouses, and 97 TND Duplex/Apartment units.**

Table 9: Alternative I: Delete TND District

A	B	C	D	E	F	G	H	I	J	K
Zoning District	Gross Acreage	Public/ Easement Protected Acreage	Net Unprotected Acres	Combined Constraints (acres)	Net Developable Acres	Adjust Infra-structure	Buildable Acres	Total Lot Count	Existing DU	Potential New Lots
Study Area B:										
R1*	53	0	53	25	28	5	23	23	0	23
R1.5**	43	0	43	5	38	4	34	22	5	17
TOTAL:										40