

# Town of Harvard



DRAFT OPEN SPACE RESIDENTIAL DESIGN (OSRD) DEVELOPMENT BYLAW

**Session 4 – Development Density**

February 6, 2020

# Bylaw Outline

- A. Purpose and Intent
- B. Applicability
- C. Definitions
- D. Conservancy Lots
- E. Open Space
- F. Development Density

- G. Permitted Uses
- H. Conditional Uses
- I. Dimensional and Design Req.
- J. Design Process
- K. Formal Process and Applic.



Link to new §130-21, Open Space Residential Design (OSRD) Option

# Key Definitions

- **Gross Acreage** – The total area of a development site including unbuildable areas.
- **Net Acreage** – The amount of the project site remaining after Primary Resource Protection Area (PRPA) has been subtracted.
- **Primary Resource Protection Area (PRPA)** – Primary resource protection areas are those lands that include unbuildable conservation resources such as wetlands, waterbodies, floodplains, and steep slopes. Note that for the purpose of calculating density.
- **Secondary Resource Protection Area (SRPA)** – Secondary Resource Protection Areas is that designated open space that must be at least 50% of Net Acreage. It may include resources that have historic, cultural, or conservation value but are technically buildable under conventional subdivision rules.
- **Base Density** – The density of the underlying zoning district.
- **Density Bonus** – An allowance for additional density in exchange for one or more public purpose-related exactions.

# OSRD Development Density

- **Base Density** - Development density of OSRD projects are generally that of the underlying zoning district, in this case Agricultural-Residential (AR), which is one (1) unit per one (1.5) and a half acres (0.67 units/acre).
- **Density Bonus** - There are several options to slightly increase development density up to no more than fifteen (15%) percent for a maximum gross density of 1 unit per approximately 1.297 acres.
- **Two (2) Methods** - The two methods for determining density or unit yield are
  1. Formula Method where the undevelopable open space is subtracted and the permitted density is applied to the remaining lands, and
  2. Yield Plan which permits the typical number of units allowed under conventional development for the same property
- **Four (4) Step Design Process** - Explained below. Shall be utilized for both methods but in a slightly different way.

# Four-Step Design Process

- A design process for OSRD projects that establishes the open space before designing the development area.
- A great fit for rural planning whether intended for rural clustering or neo-traditional hamlets and villages (Arendt, R., 1996, p. 41).
  - **Step 1:** Identify All Potential Conservation Areas
  - **Step 2:** Locate the House Sites
  - **Step 3:** Design Street Alignment and Trails
  - **Step 4:** Draw in Lot Lines or Exclusive Use Areas
- Note that for village-like developments, you should reverse steps 2 and 3.

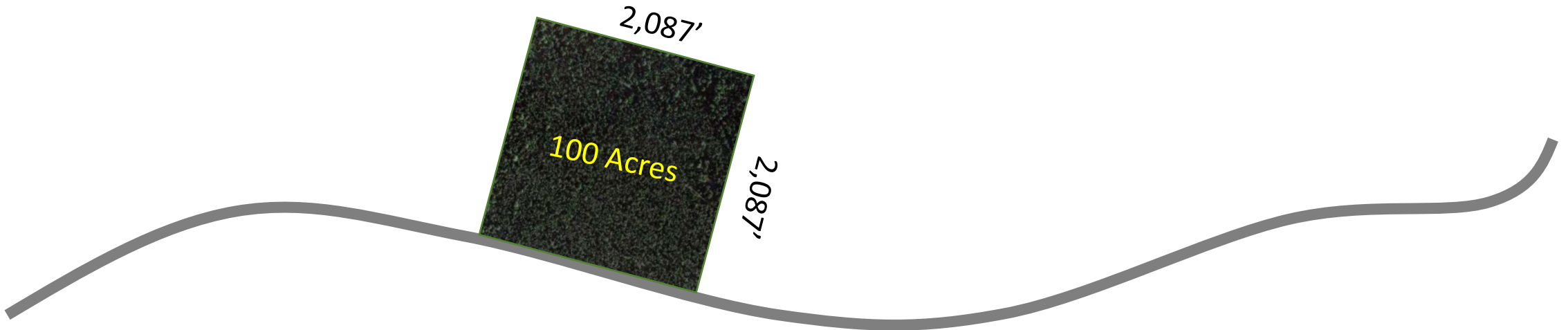
# Formula Method

- Step 1: Determine Parcel Size
- Step 2: Determine Primary Resource Protection Area (PRPA)
- Step 3: Establish Net Acreage (NA)
- Step 4: Establish Base Development Density Applied to NA
- Step 5: Determine Permitted Yield (PY)
- Step 6: Determine Total Open Space Set Aside (TOS)
- Step 7: Calculate Bonus Units (if applicable) and Total Final Yield

# Step 1: Determine Parcel Size (Gross Area)

- Easy...what is the size of the subject parcel?
- For purposes of an exercise, let's say 100 acres.

**Parcel Size or Gross Area (GA) = 100 acres (435,600 s.f.)**



## Step 2: Determine Primary Resource Protection Area (PRPA)

- The PRPA consists of unbuildable land area such as wetlands, floodplain, steep slopes, and ROW for utilities, and other purposes.
- Several classifications of PRPA land only get partial credit for removal. For example, for 3 acres of wetlands, only 0.3 acres would be counted related to density.

**Gross PRPA 16.35 acres - ((Wetlands \* 0.10) + (Slopes > 25% \* 0.50) + (100 yr. Floodplain \* 0.50) + Open Water + ROW) = Adjusted PRPA**

$$\text{APRPA} = (3 * 0.10) + (1.5 * 0.50) + (2.25 * 0.50) + 2.3 + 7.3$$

$$\text{APRPA} = (0.3) + (0.75) + (1.125) + 2.3 + 7.3 = \mathbf{11.775 \text{ acres}}$$



## Step 3: Establish Net Acreage (NA)

- Subtract the Adjusted Primary Resource Protection Area (APRPA) from the Gross Area (GA) of the parcel, thus:

$$\text{Gross Area (GA)} - \text{APRPA} = \text{Net Acreage (NA)}$$

$$100 - 11.775 = 88.225 \text{ acres}$$

## Step 4: Establish Base Development Density (BD) Applied to NA

- The maximum number of dwelling units per acre permitted in an OSRD shall not exceed one (1) unit per 1.5 acres (density of Agricultural-Residential Zoning District) and no more than 2.0 bedrooms per acre of the net density of the land area.

**Base Density (BD) = 1 unit/1.5 acres or 0.67 units/acre**

## Step 5: Determine Permitted Yield (PY)

- The Permitted Yield (PY) is the maximum number of residential units in an OSRD and is calculated by a formula based upon the Net Acreage (NA) of the property after the APRPAs have been removed. This formula is intended to take into account site-specific development limitations that make some land less developable than other land. This calculation involves two steps, calculating the Net Acreage (NA) and multiplying by the allowed (base) density or BD. Fractional units of less than 0.5 shall be rounded down and 0.5 or more shall be rounded up.

**Permitted Yield (PY) = Net Acreage (NA) x Base Density (BD)**

Using example from Step 3

**59 units = 88.225 acres x 0.67**

## Step 6: Determine Total Open Space Set Aside (TOS)

- Total Open Space Set Aside (TOS) is the total amount of open space set aside for the project. This is calculated by taking the Gross Area (GA) of the parcel, subtracting the Adjusted Primary Resource Protection Area (APRPA) resulting in Net Acreage (NA), fifty (50%) percent of the NA shall be open space defined as Secondary Resource Protection Area (SRPA), and finally adding any additional open space set aside to achieve a density bonus for Bonus Open Space (BOS) to the remaining 50% so thus:

$$\text{TOS} = (\text{NA} \times 0.50) + \text{BOS}$$

Again using our 100 acre project example

$$49.1125 = (88.225 \times 0.50) + 5.00$$

## Step 7: Calculate Bonus Units (if applicable) and Total Final Yield

- Final calculations for the example development are as follows:

**Project Size = 100 Acres**  
**Primary Resource Protection Area (PRPA) = 16.35 Acres**  
**Adjusted PRPA = 11.775 Acres**  
**Net Acreage (NA) = 88.225 Acres**  
**Base Density (BD) = 0.67 Units/Acre**  
**Permitted Yield = 59 Units**  
**Minimum Open Space = 44.1125 Acres**  
**Additional Open Space = 5.00 Acres (0.5% Bonus Per Acre)**  
**Total Open Space = 49.1125 Acres**  
**Building Site = 39.1125 Acres**  
**Adjusted Permitted Yield w/ Bonus of 2.5% = 60 Units**  
**Adjusted Density = 0.69 Units/Acre**  
**Buildable Area Density = 1.53 Units/Acre**

# Yield Plan Method

- Applicant provides a less formal site plan similar to a preliminary subdivision plan that shows how many lots could be developed on the lot conventionally.
- The plan does need to be realistic and economically capable of being constructed.
- Soil suitability for septic service must be demonstrated and 10% of lots must be tested and these shall be selected by the Planning Board.
- Once the number of lots is determined by the Yield Plan, this is the number of lots that will be permitted on the site for an OSRD notwithstanding any density bonuses.
- Applicant then proceeds with the 4-Step design process.

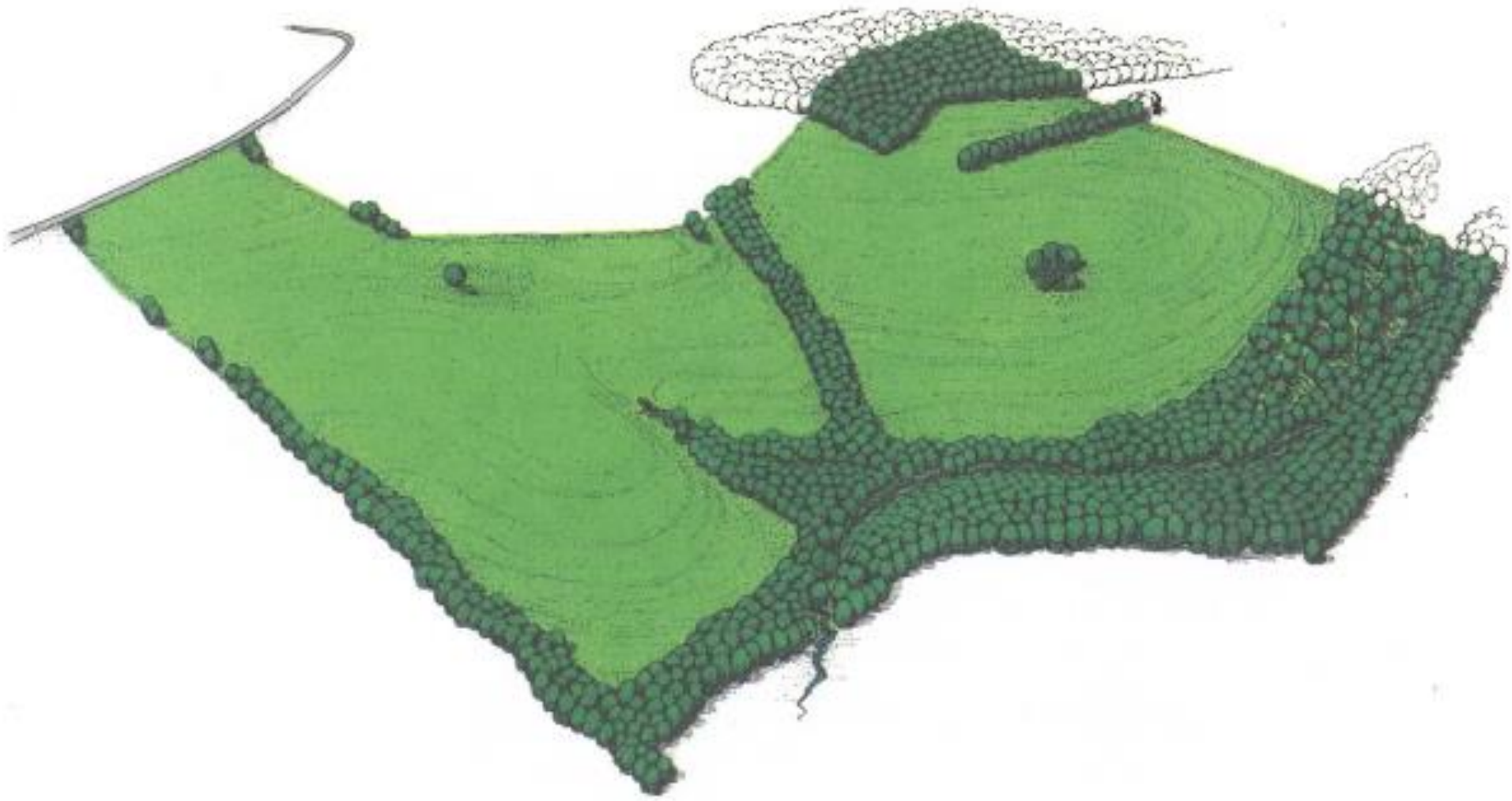


Figure 7A-1. Site A: Before Development



Figure 7A-2. Site A: Yield Plan





Figure 7A-3. Site A: With Conventional Development

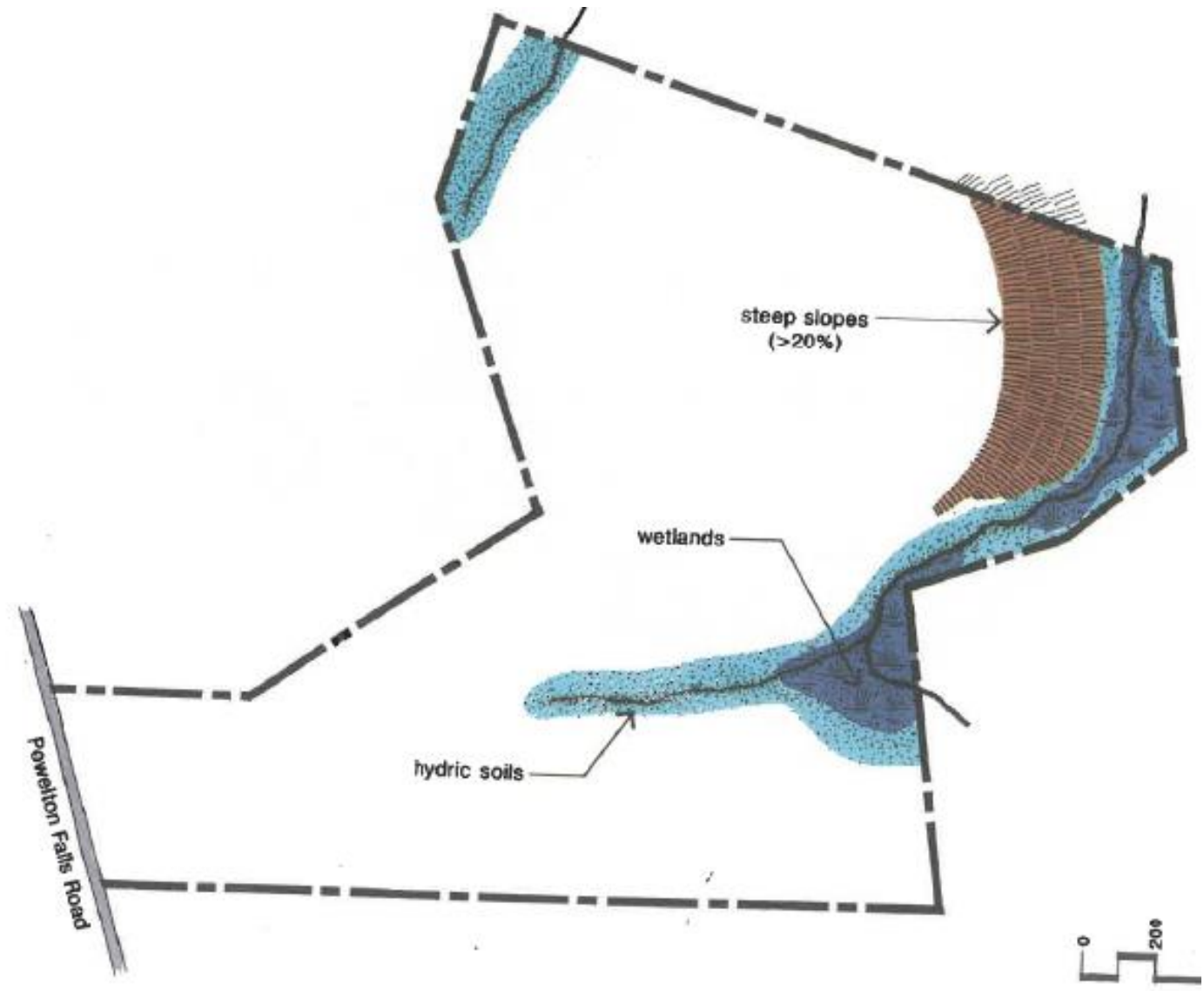


Figure 7A-4. Site A: Identifying Primary Conservation Areas

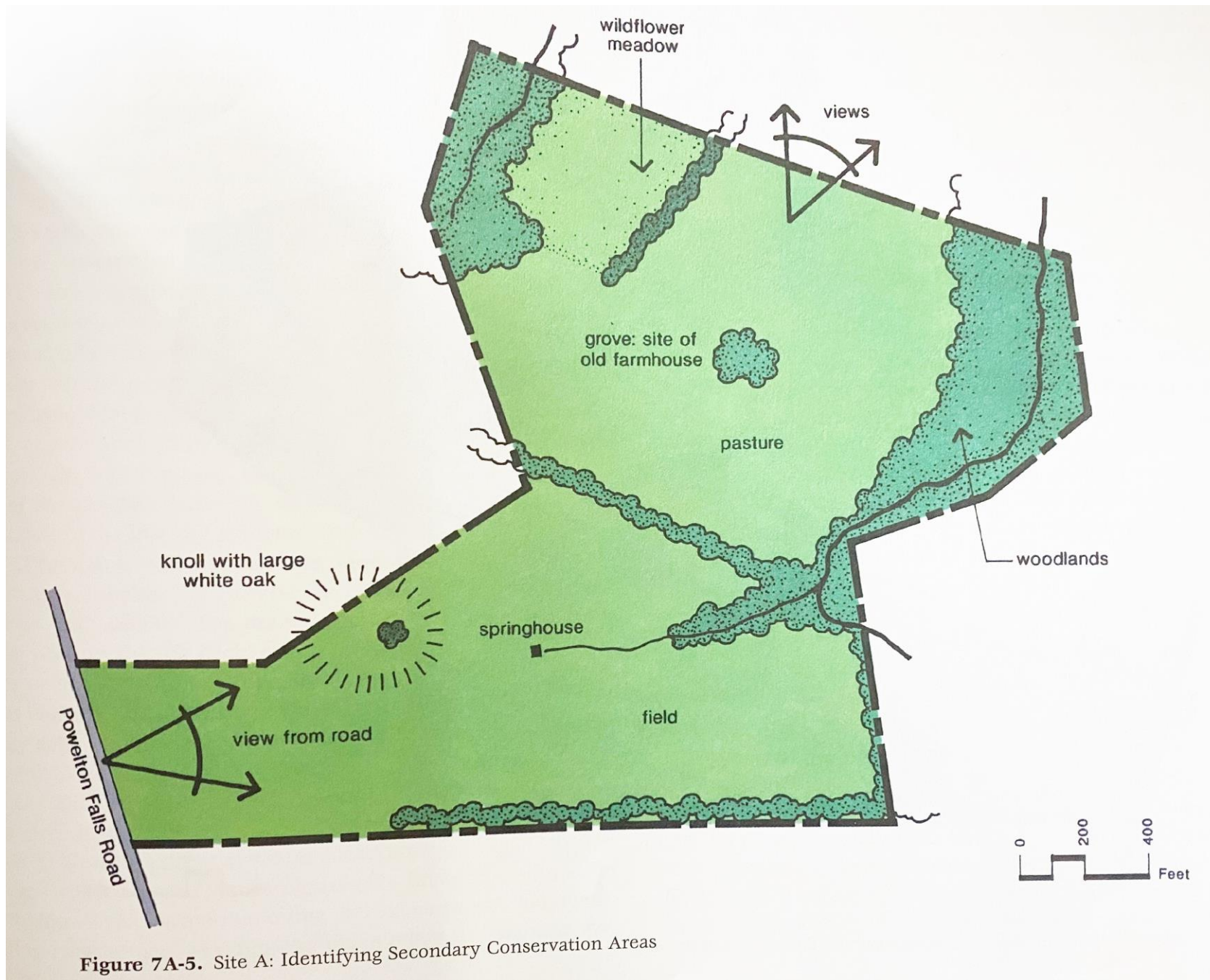


Figure 7A-5. Site A: Identifying Secondary Conservation Areas



Figure 7A-6. Site A: Identifying Potential Development Areas

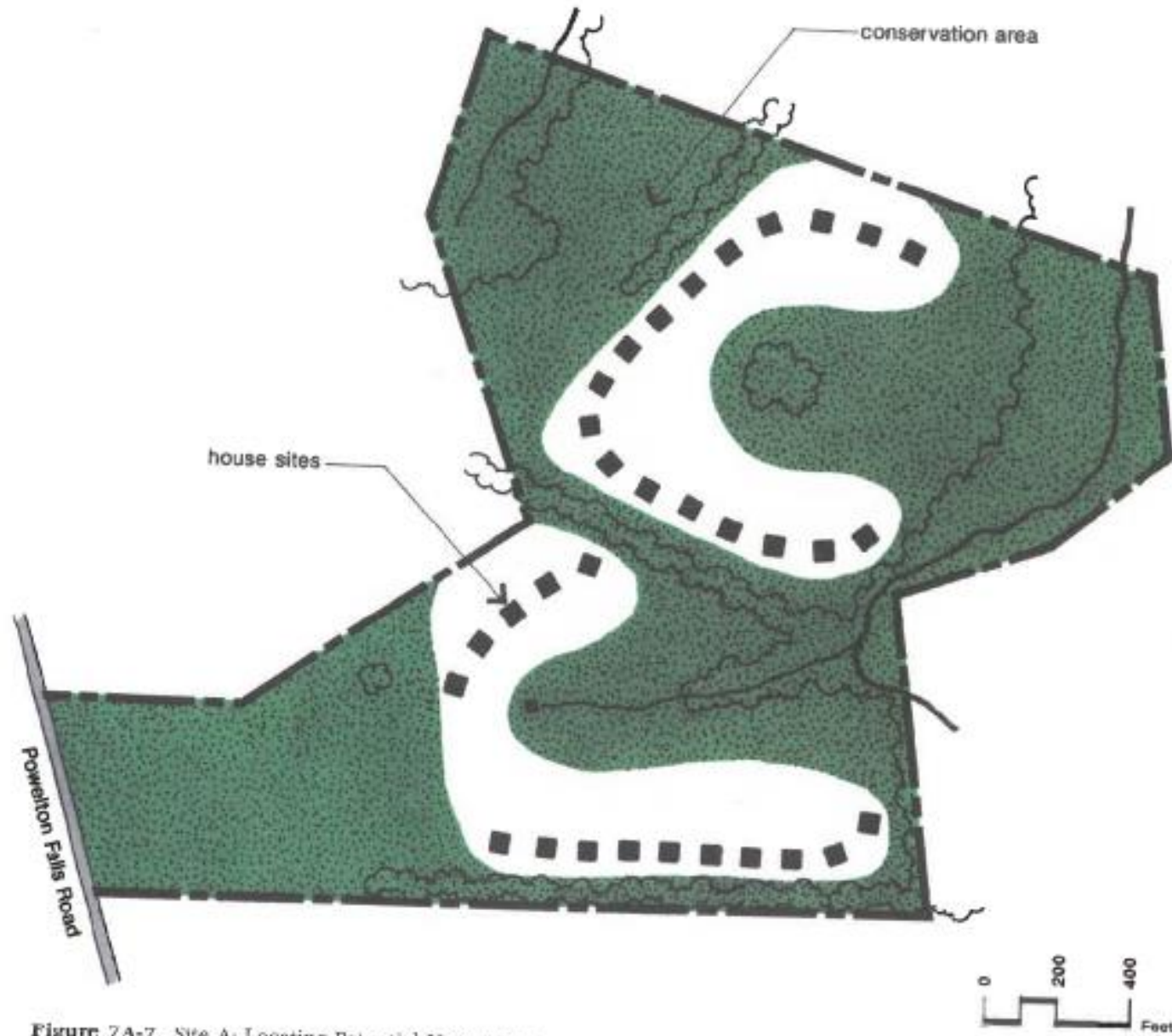


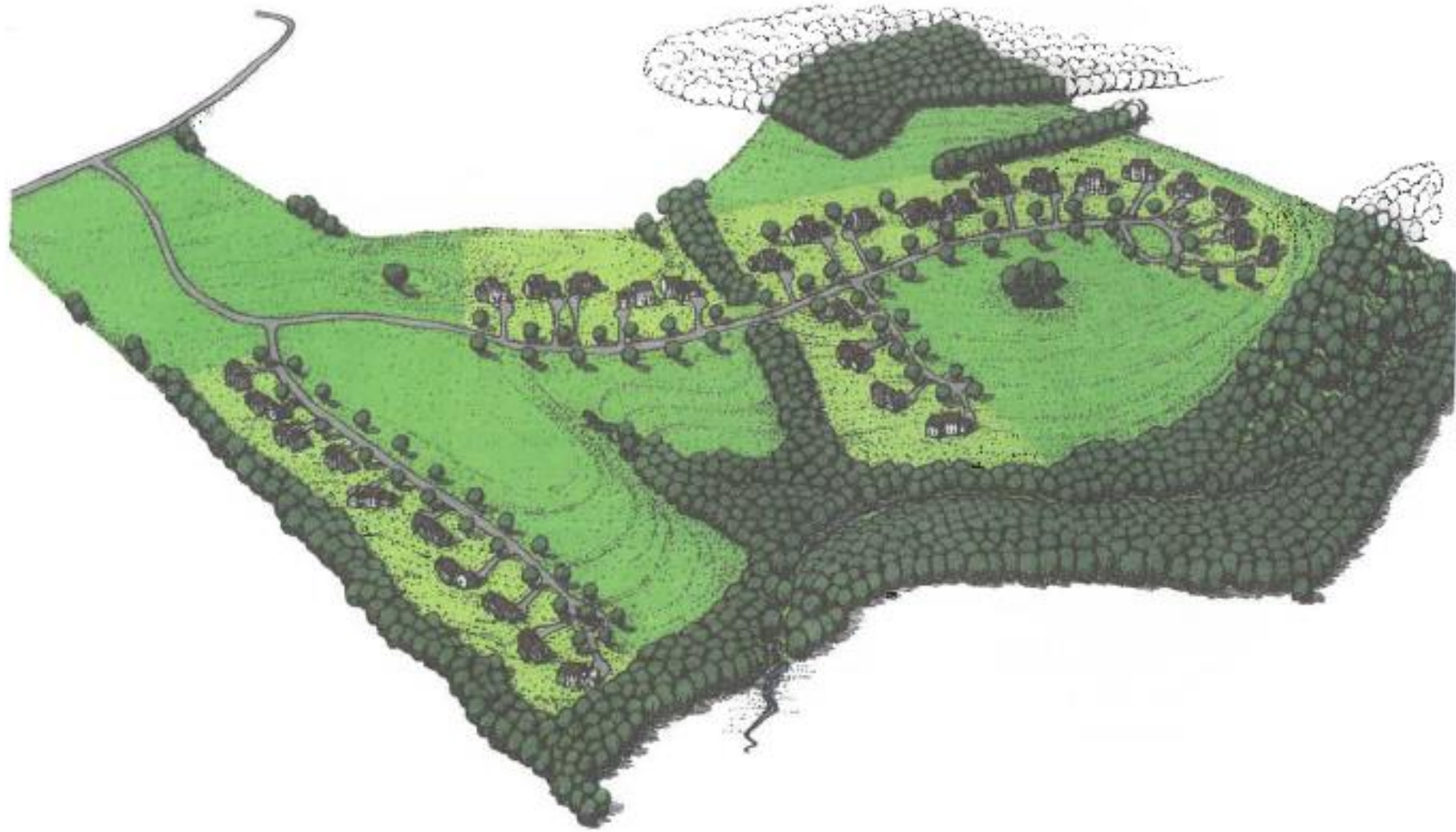
Figure 7A-7. Site A: Locating Potential House Sites



Figure 7A-8. Site A: Designing Road Alignments and Trails



Figure 7A-9. Site A: Drawing in the Lot Lines



**Figure 7A-10.** Site A: With Conservation Design



