2: Conservation Design Method

Promoting Good Design:

As mentioned in the last chapter, the traditional method for subdivision design is typically to commission or otherwise obtain a survey of the property boundaries of the site, divide the land into evenly-sized lots, plunk in a few roads to access those lots if needed, and then attempt to site homes on them as best as possible. Sometimes one lot has several terrific options for home sites while the lots around it are forced to settle for the best of a set of poor options. This often results in drainage issues, unsuitable house sites, removal of forests, hedgerows, and other unique features, or overwhelmingly uninspiring, cookie-cutter, lifeless developments. The reason for this is that **the traditional approach has its priorities wrong**, and does the step which should be first - setting aside land and picking house sites - last, and the step which should be last - laying out lots - the traditional method does first.

Do It Backward - Randall Arendt's Approach:

Randall Arendt is a planner, site designer, writer, speaker, and advocate for conservation-minded planning. His methods have been developed over the years, and he has become known for his clear writing, practical approach, and accessible diagrams and drawings which illustrate his points. In his *Growing Greener Workbook* and other works (see Appendix B), Arendt lays out a process which approaches design the other way around, which he refers to as "**Conservation Subdivision Design**."

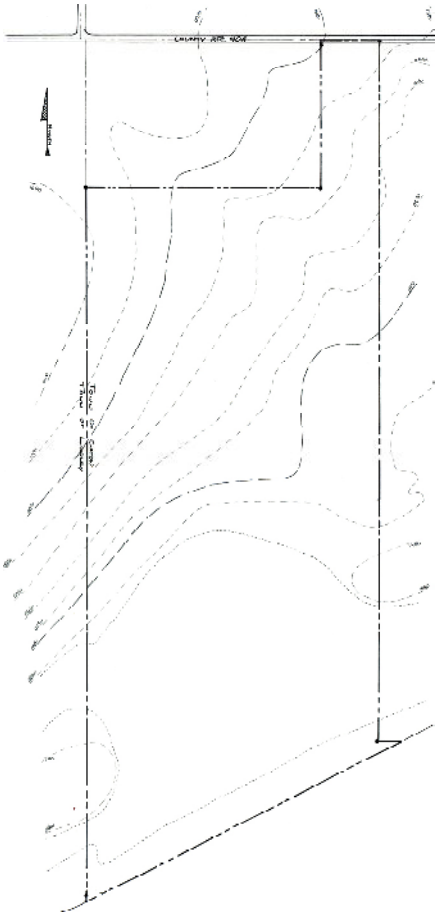
This process begins with **an extensive analysis and mapping of the site** - done in a straightforward manner with easily accessible tools and resources. A good design begins with a solid understanding of the site. From there, the four-step process is the reverse of the traditional development model. Instead of the last step, **the first step is to set aside land for conservation** and protection. This, then, is not the "leftovers", but the land that most deeply influences the character of the site and gives it its character. **Once that has been determined, houses are sited** - not merely in the best choice possible within a constrained lot which has already been laid out, but on the best locations over the whole of the site. Only after there are homes to access are roads drawn in, cutting down on unnecessary road length and allowing the subdivision to be **designed as a neighborhood** rather than a group of homes. Finally, instead of the first step as it often is in a traditional development, **the last step is to divide the land into parcels**, in a way that makes sense with the rest of development and conserves land.

This approach provides an exemplary model for a better design process in a simple, easy to remember form: when it comes to design, take the traditional method and "Do It Backwards." In the following pages, we'll **demonstrate that process** with an individual site: the Lonny DeWalt property.

The DeWalt Property - A Case Study:

Lonny DeWalt's property of about 60 acres is an interesting site and a terrific opportunity to demonstrate Conservation Subdivision Design. The site, in the town of Caton at the Lindley border, contains a large portion of the roughly 25-acre Spencer-Martin Wetland, a prime wildlife habitat located at the headwaters of several watersheds.

The wetlands has been incorporated into the New York State Open Space Plan for protection, and a local group had expressed an interest in purchasing the whole property if available. Knowing that they may not be able to raise the money to afford the entire parcel, we wanted to work out a plan which allowed some homes onto the site in order to make some money for DeWalt while still allowing public access to the wetland and preserving a large enough upland buffer to protect the area. In addition, DeWalt is a minister, and expressed a desire to set aside a parcel of the land for a church retreat, in a secluded lot near the wetland but also separated somewhat from the proposed homes.



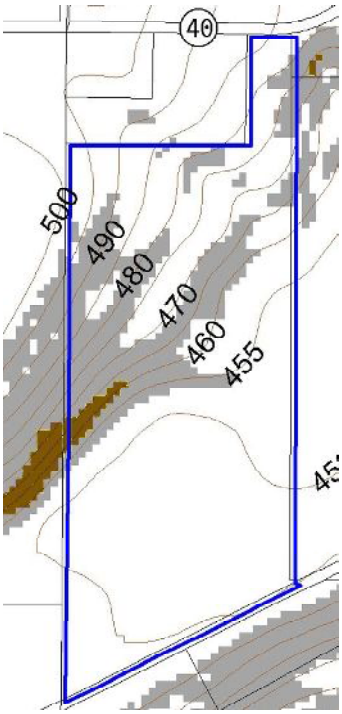
Preparation: Site Analysis

Overview:

A good design needs to come from a solid foundation, and that foundation is **a knowledge of the site**. After all, you can't know where the best sites for placing the houses are if you don't know what makes them good or bad. There's a lot more that should go into this step than simply the site survey typically required under current zoning; you'll want to look at slopes, at aerial photographs, at soil characteristics, and at the unique qualities of the site itself. Before that sounds too daunting, however, rest assured - it doesn't cost an arm and a leg. **In fact, it likely won't cost a dime!**

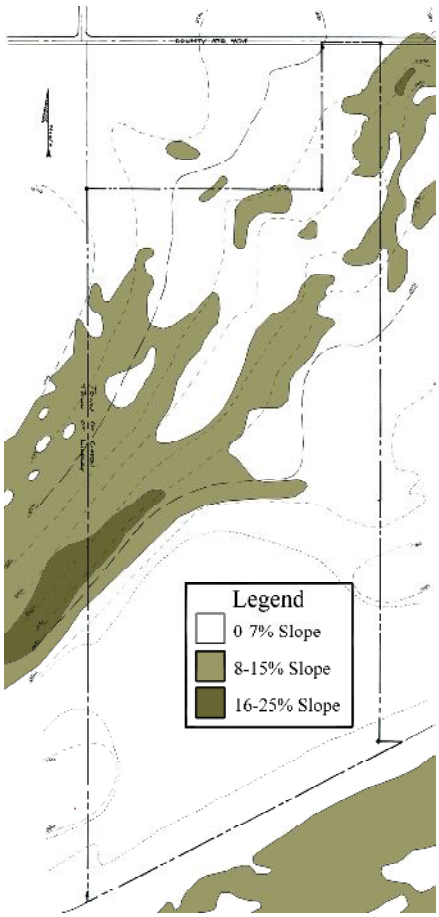
All of the resources we're about to use in this example are **free or affordable and available to the public**. Contact the STCRPDB if you need help accessing them. The easiest way to handle these maps is to simply copy them onto tracing paper; this makes them easy to overlay, compare, and interpret.

Slopes:



On its own, a contour map can be difficult to read if you're not used to it. In addition, what's most important isn't how high the land is (well, except where floodplain issues are a concern), but **how steeply it's sloping**. Steeper slopes are more prone to be unstable when disturbed by development, create drainage and grading issues when siting homes, and are more expensive to build on. Thus, an important step in site analysis is to map the slopes.

A **GIS (Geographic Information System)** program provides a useful tool for this, and a printout such as the example shown (right) makes a good starting point for a slope map, but you can also create one yourself by **measuring distances between contours**. Generally, a slope up to 7 feet vertically in 100 feet horizontally (or 7%) is considered well-suited for development. Slopes from 8% to 15% are less optimal but developable if needed (for comparison, a typical handicapped-access ramp in a building is just over 8%). Areas from 16% to 25% are marginal at best and should be avoided if at all possible, especially when they are currently wooded - the potential for erosion is too great. And lastly, slopes over 25% (1 foot vertically per 4 feet horizontally) **should be avoided under any circumstances**. These divisions are the ones used in the mapping in this book.



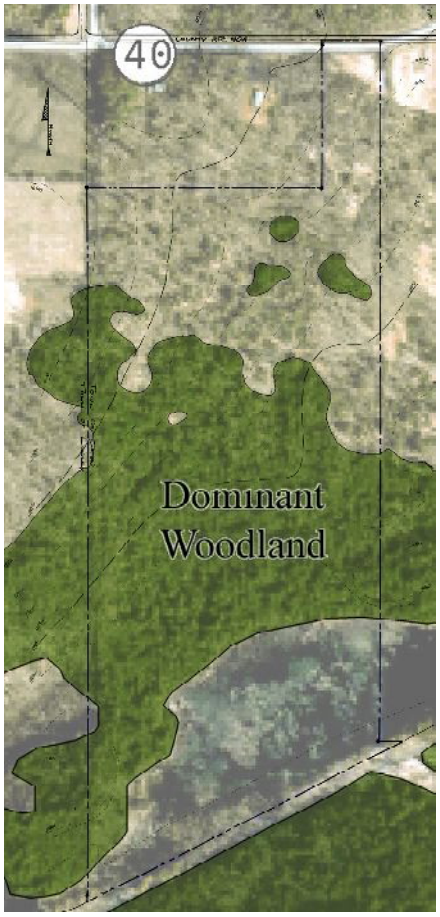
The GIS map is a good starting point, but its contours are in metric units (at least, in this case) and the slopes are rather blocky. Fortunately, since slopes are merely a proportion (of rise to run), the metric units don't change the slope. What we need to do, then, is (as shown, left) trace the blocks and smooth them out. And there you have it - a map of the sloped areas.

Soils:

It's generally a good idea to obtain a soils map as well, and copy it onto a tracing-paper overlay. What's primarily important here isn't the names of the soil groups (though those might be worth recording), but the information in the index of soil types regarding **what type of development and use (agricultural, drainage, stability, etc) the soil is suited to**.

In the case of the DeWalt site, no particular constraints to development were found except the extensive wetland, and erodibility issues in the steeper area in the woodland (already reflected in the slope map). Since no agricultural use is intended for the site post-development (the limited former farmland is the part slated for use), an extensive analysis of soil qualities for agriculture wasn't merited.

Aerial Photography:



GIS is able to combine an aerial photograph (which are available through public databases) with a site boundary, as demonstrated at right. **Aerial photographs are done to a particular scale** and can be measured and drawn upon just like a map, so if GIS isn't an option, you can also perform this step yourself by measuring from identifiable landmarks.

You can use an aerial photograph to help **denote particular features which might not show up on a survey otherwise** - the precise locations of hedgerows, the edges of woodland, the layout of farmed fields, the course of a stream, an existing but unsurveyed farm road which could be improved, and more. These should also be **supplemented by notes and observations from walking the site itself**, noting things that may not be apparent from the air. Trace any of these features which are important to the site onto your overlays - you'll want to know how they relate to other features.

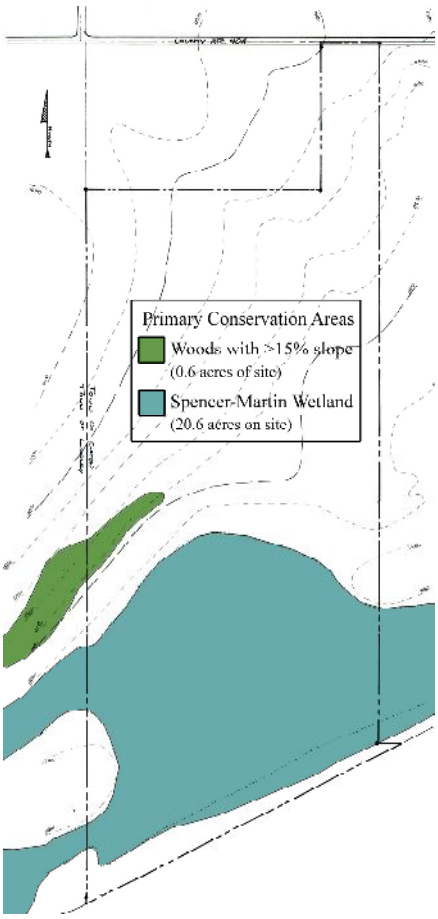
In the case of the DeWalt site, as shown here, the primary feature of note is the **current extent of the wooded areas** (shaded over the photo, right). There are no intact hedgerows remaining, nor are there any apparent stream corridors or other noteworthy features.

Other Issues:

Be sure to **note anything else of particular importance** to the site's development on some or all of your overlays, as well - you'll want to know any particular peculiarities of drainage, etc, as well as the character of surrounding areas. Perhaps views are of particular importance to the site's character, or wind direction and solar orientation may be critical factors in your design. **Whatever it is, make note of it** somewhere in your mapping.

In the case of the DeWalt site, the major factor is the Spencer-Martin Wetland. It is about 25 acres, the majority of it on-site, and is listed by NYSDEC as a Class II wetland. It was listed in the NYS Open Space Plan 2001. The wetland is located in the headwaters of several watersheds: the northern portion drains into Barnard Creek and the southern end drains into Ryers Creek. Ecologically, the wetland includes open water, emergent vegetation surrounded by a former pasture, and northern hardwood forest. Ducks, geese, herons and beaver make the wetland their home. Both the wetland itself, and a buffer area around it, are critical factors in any design for the site.

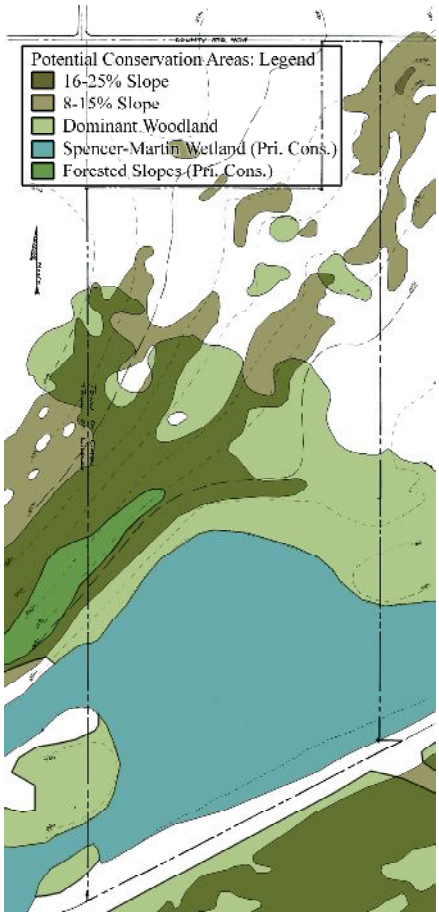
Step One: Define Conservation Areas



Once these maps have been completed, the next step is to use them to **identify primary and secondary conservation lands**. This is done, typically, by overlaying the maps created earlier and "drawing up" the important features of them to provide a map which combines all the aspects.

Primary conservation lands are those which are ecologically or otherwise sensitive, and cannot or should not be built upon - wetlands, land that is part of a waterbody, land within the 100-year floodplain, extreme slopes, soils prone to slumping, and wooded sloped areas prone to erosion when developed. These areas, in Arendt's process, are **removed from consideration** when discussing the buildable acreage of the site.

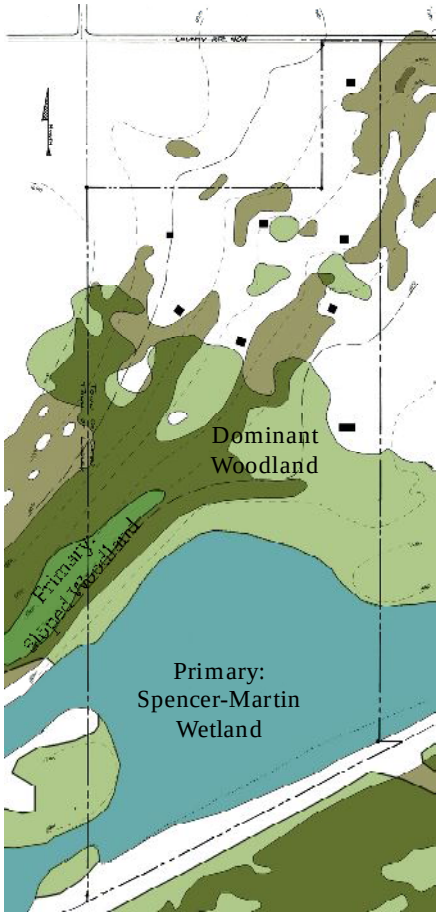
In the case of the DeWalt site, as shown (right), the Spencer-Martin Wetland and the area of steeply-sloped, wooded terrain have been set aside as Primary Conservation areas. These two areas total about 21.2 acres on site, and bring the buildable acreage of the site down to about 37.5 acres.



Secondary Conservation areas are those which are intentionally set aside to be preserved. Under a Conservation Subdivision plan such as Arendt proposes, **at least half of the buildable acreage is to be set aside for conservation**, and the full density of that area is eligible to be transferred to the remaining land so that **the potential for development is not reduced**. These areas should, if possible, form a continuous whole which, ideally, ties together with similar areas on surrounding sites, creating the potential for a **network of green space** extending through the community. Generally, these areas are those marked above in one of the maps are good candidates to become part of the Secondary Conservation portion of the site.

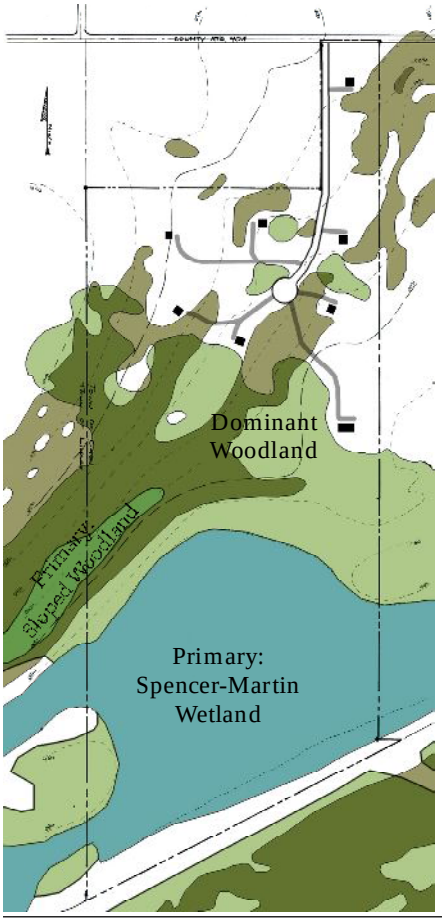
The DeWalt site's major feature which could otherwise be developed is the mature woodland. Thus, the goal is to preserve that woodland wherever possible and to create a trail system giving access both to the forest and to the wetland at the bottom of the hill.

Step Two: Locate Building Sites



Arendt's next step is to **locate the most suitable house sites within the remaining space**. With an eye to locating these houses suitably in relation to one another and on the best possible sites on the remaining, non-conserved land, and keeping in mind the target density and appropriate spacing of homes, the best areas to place homes frequently seem to jump off the page at you when you're looking down at the overlay of maps.

Here, with just over 18 acres as our goal for the maximum developed land, and looking to keep a low-density feeling in the subdivision to maintain the rural character, we have chosen to site 8 potential homes on the northern portion of the site. Tucked back into the woods in the southeast corner of the development, one of the sites is particularly appropriate for the church retreat that Mr. DeWalt expressed an interest in creating.

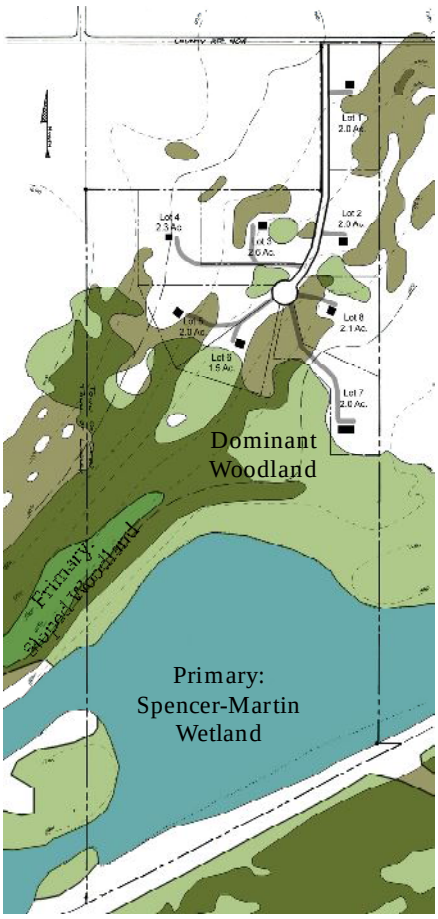


Step Three: Lay Out Roads, Trails, and Access

From here, the next step is simple; devising **the most appropriate and economic way to gain access to those sites**, and exploring the access from those sites to the conserved land, whether it be via easments through private lands or through mutually-held trails.

In this case, a relatively short road off of County Rte. 40A terminates in a cul-de-sac broad enough to allow emergency vehicle turnaround, avoiding both steeper slopes and woodland as it curves in to a central spot in the site.

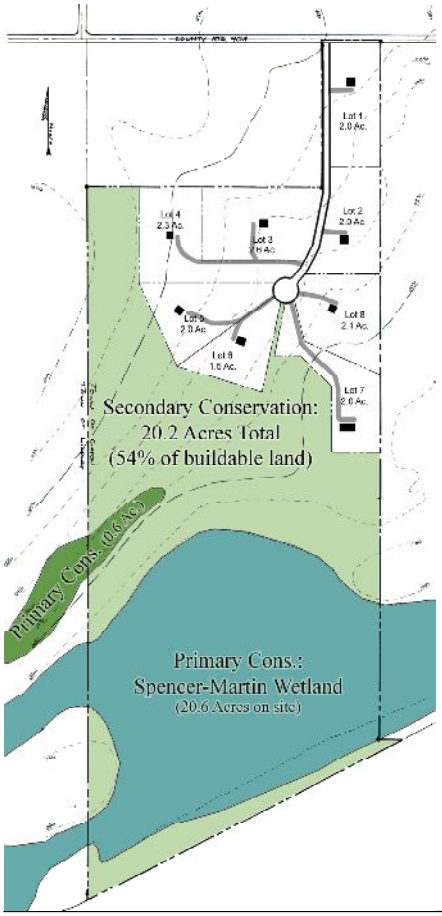
Step Four: Draw in Lot Lines



The last step in Arendt's process is **the division of the land into individual parcels**. With proposed conservaion areas in mind, and keeping access for each house clear, it's simple to draw in lot lines and divide the area into parcels.

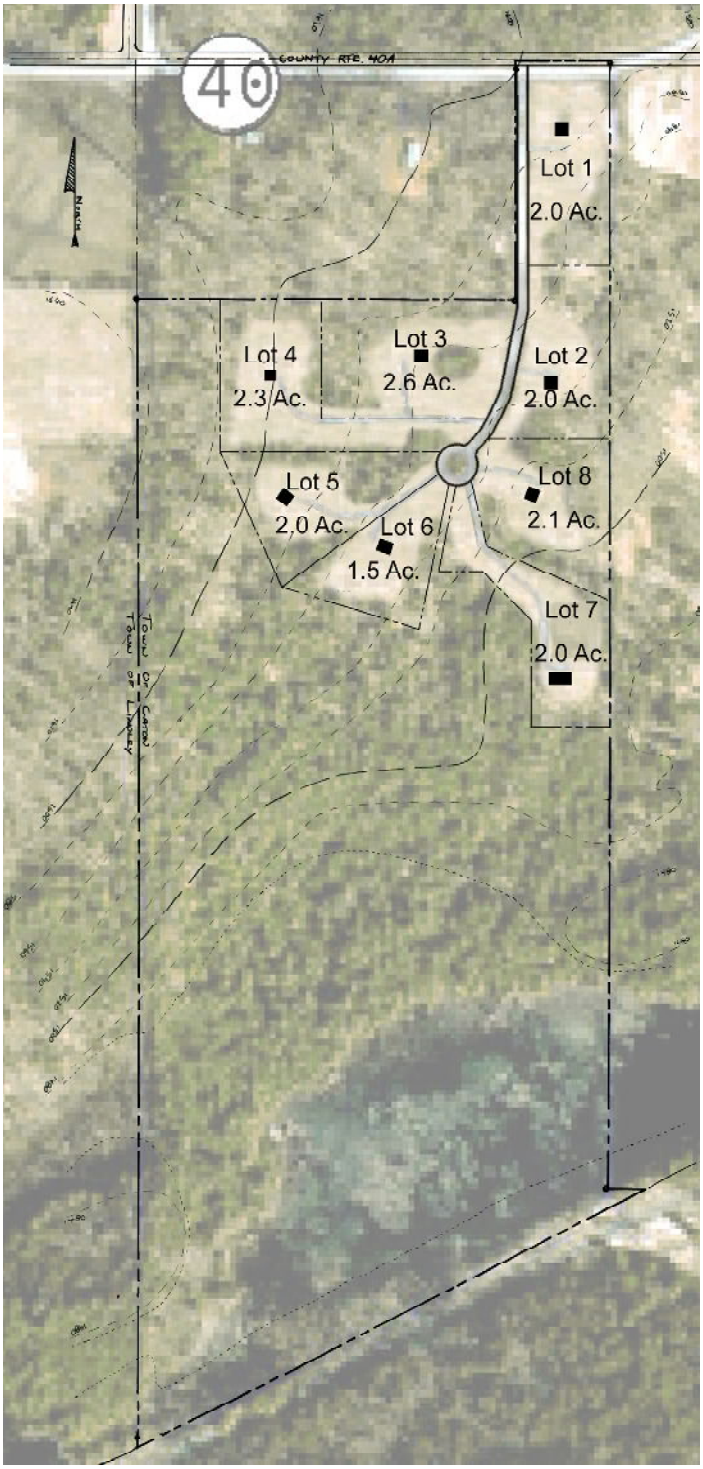
Keep in mind local zoning codes while you're working on this step. Most towns have minimum lot sizes, setbacks, and lot widths; **sometimes, there are exceptions made in cases of "cluster housing"** where a percentage of the land is kept as open space. In this case, the Town of Caton allows lots down to half of the standard 2-acre minimum, provided that at least half of the developable land is kept as open space. We haven't needed to go that low; the only lot under 2 acres in the scheme measures 1.5 acres.

Also pay attention to opportunities for special or unusual lots; lot 7, as mentioned before, which tucks back away from the others and nestles into the edge of the woods, is well suited to fill Mr. DeWalt's desire for a church retreat.



Final Layout Analysis:

In the end, for the DeWalt site, Arendt's process has resulted in **just over 50% of the buildable land held in conservation, all in one continuous chunk** which connects with open space to both sides and provides a substantial buffer for the ecologically sensitive wetland area. The 8 lots average out at just over 2 acres each, and only about 950 feet of new road is required. Well over 300 feet of guaranteed buffer exists between the wetland and the closest corner of potential development, and the closest planned building is significantly further.



Proposed development reflected in digitally-modified aerial photo

Adapting Arendt's Methods:

Arendt's method for Conservation Subdivision Design is **only one potential option for good design**; sometimes, the resulting density is not desired, or other factors serve to limit the potential for a Conservation Subdivision as outlined above.

The most likely obstacle or complication arises when 50% of the buildable acreage is not a suitable figure for conservation, whether for economic reasons or otherwise. In addition, the process only addresses residential subdivisions, and is not completely transferrable to mixed-use or commercial ventures without soem rethinking.

The process, however, is a fundamentally sound approach, and is **far preferable to the traditional one**. These steps, whether taken directly as Arendt proposes them or as a model and a goal, are the basis of sound, good design, as you'll see in the chapters to come.

For an example of how this process can be codified into zoning law, be sure to explore STC's website for the Village of Painted Post's Subdivision Law referenced in Appendix D.

For more information on Conservation Subdivision Design and Open Space Planning, take a look at Appendix C; the bibliography also lists several ofArendt's other books.