Y ou’ve seen those homes – residential solitaires – nestled among trees or surrounded by acres of mowed lawn, sprouting up around the city, within an easy driving distance of urban amenities. They have different monikers depending on where you live: acreages, ranchettes, country or rural residential, peri-urban, or exurban. This growing phenomenon isn’t just changing the color of the landscape near large cities like Seattle, Ft. Worth, or Baltimore, but throughout agricultural and forested lands in all parts of the country.

Any way you cut it, these small gems can have a big impact on natural resources and delivery of technical assistance. If development is haphazard the impact can be negative, creating a loss of natural vegetation and open space and a general decline in the extent and connectivity of wetlands and wildlife habitat. But, when well planned, acreages can create important corridors, preserve native plant communities, and maintain permanent vegetation in an otherwise fragmented landscape.

Providing technical assistance to this diverse group of landowners can also have a big impact on the workload of conservation districts, NRCS, State forestry, and extension offices. Often the carrot that motivates acreage owners isn’t production, but scenery, wildlife, privacy, or a reconnection to the environment. This opens the door for conservation professionals to educate and provide clarity to landowners as they manage their prize property for bigger, broader, and better benefits.
Opportunities in the Rural/Urban Interface

A curious thing tends to happen when tracts of farmland or forests are subdivided and homes are built on small acreage parcels. Typically, the efforts by local, state, and federal agencies to promote conservation are abandoned since the lands are no longer perceived to fall under the purview of rural conservation programs and the limited urban efforts at conservation are confined within municipal boundaries. This rural/urban interface zone effectively becomes a no-man’s land for conservation efforts. Yet, ironically, one of the main reasons that people buy a few acres and build a home on it is to get closer to nature. Today, there are very few places remaining in the United States where populations are not growing and exerting pressure to convert working lands into home sites.

There is an opportunity to harness this land conversion trend so that many conservation benefits can be perpetuated or even enhanced. Many agroforestry plantings are well suited to small acreages. Often the best opportunity to develop “green infrastructure” around communities will be through orchestrating a coordinated response from landowners living on small acreages within the rural/urban interface. In many cases, cropland is converted and there are opportunities for landowners to greatly improve ecological services and landscape diversity by planting trees, shrubs, and native grasses, rather than the all-too-common fescue lawn. For this to succeed it is imperative that landowners be informed of their options and understand the spatial context of their land within the overall landscape. For example, knowing that one’s land is strategically positioned relative to remnant patches of forests to provide critical habitat for songbirds may lead a landowner to plant or retain the appropriate tree and shrub species.

Maryland buffer design and maintenance guide now available

This new, free, 52-page guide was developed for the Chesapeake Bay and Mid-Atlantic region to help professionals or motivated volunteers learn about riparian forest buffer establishment and maintenance.

The guide includes sections on goals, “reading” the site, afforestation, and maintenance needs.

Techniques are organized by prior land use (crop, pasture, or turf) and address weed, deer, and rodent control issues. The Appendix contains a planting checklist, list of common invasive weeds, and herbicide options.
The conflict between rural neighbors who are farming and those who are essentially urban people living on acreages, arises from a series of very different expectations and activities. Some of these are agricultural induced, such as livestock odors, pesticide drift, and equipment noise and some are urban induced, including high-speed traffic, garbage in fields, and gates left open. Often people have difficulties understanding why others do not accept or understand activities that for them are commonplace and acceptable. Tensions between agricultural rural landowners and acreage landowners can intensify because of the increased number of neighbors and contact points as a result of the smaller-sized land ownership pattern.

The National Agroforestry Center along with the University of Nebraska has developed a concept of ecobelts as a system of green infrastructure that transforms the zone of conflict into one of shared ownership and use. These Working Trees can take many forms, such as windbreaks, living snowfences, riparian forest buffers, and alley cropping. When carefully planned and designed, ecobelts can address a wide range of non-conservation issues, from education and visual quality to income generation, while helping to create a sense of place and community. Ecobelts bring neighboring landowners into a partnering relationship where the needs of each are accommodated.

Green infrastructure

Communities have long understood the need for “gray infrastructure” like water, sewer, and power lines, and roadways. More recently, the importance of “green infrastructure,” a planned and managed, interconnected network of natural areas (e.g., waterways, wetlands, forests, and parks) and adjacent working lands (e.g., farms, ranches, and corporate lands) has gained recognition. Together, these lands have the potential to support wildlife, maintain ecological processes, sustain air and water resources, and contribute to the health and quality of life for communities. For more information about how green infrastructure can be integrated in your area, visit NAC’s Web site and read the Sustainable Development: Moving toward a greener community brochure.

Ultimately, for ecobelts to be successful they must be culturally sustainable. That is, the ecobelts must elicit sustained human attention over time or else the benefits may be compromised as land ownership changes, as development pressure increases, or as different political viewpoints arise. So, how do we create ecobelts that are so desirable that they can weather the test of time? There are a few principles that will help in the creation of viable ecobelts:

- **Shared ownership** – When all adjacent residents have a stake in the ecobelt it helps to build a sense of community and responsibility for implementing and maintaining the system. Ownership is not necessarily deed ownership and can be created through the planning process.

- **Problems as opportunities** – Although this phrase wears thin after awhile, when problems are reformulated into a positive framework, residents can use the issues to bring resources together to benefit the larger community.

- **Agroforestry products** – When care-
We often think of farmers and large acreage landowners as target audiences for reforestation and riparian buffer programs. But, in the gently-rolling Piedmont area of Maryland, a new program is finding that landowners in smaller rural residential subdivisions are willing to listen and willing to plant trees.

Using aerial photography and cadastral (land ownership) data, the Baltimore County Department of Environmental Protection & Resource Management (DEPRM) discovered that many landowners “use” only 1.0 to 1.5 acres of their 3-plus acre lots. Field observations showed that “excess” acreage, often former farmland, is most often simply mowed. GIS data on these findings later revealed that many of the unforested areas were adjacent to, or near, streams and rivers. These mowed areas provide very little wildlife habitat or water quality benefits and demand a significant amount of maintenance.

To address this problem, DEPRM is using a pilot program, the Rural Residential Stewardship Initiative (RRSI), to educate landowners in these subdivisions about various incentives to plant buffers. The project’s objective is to plant five acres of trees in each of five subdivisions. RRSI received so much interest from landowners that DEPRM considered extending the project before the first projects were even complete.

**The Approach**

1. Cooperate with a known conservation organization to make the initial landowner contact;
2. The conservation organization solicits a resident volunteer in each subdivision to host a meeting with neighbors at which DEPRM staff describe the RRSI program;
3. DEPRM staff provide education about managing a shared forest-stream resource in their local watershed; (Currently, DEPRM is developing a “landowner’s manual” about reforestation maintenance and an overall subdivision stewardship

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**Neighbors are working together to increase forest cover in Maryland watershed**

**Don Outen**  
Natural Resource Manager, Baltimore County Department of Environmental Protection & Resource Management (DEPRM), Towson, Maryland
For thousands of years, fires shaped the lands of North America, affecting the composition of plant and animal communities. Fires used to burn some grasslands nearly every year, while some forests and wetlands escaped fire for centuries at a time.

Many plant species actually thrive when burned at periodic intervals. Knowing this, we can attempt today to either reintroduce fire or take advantage of naturally-occurring fires to benefit rural landscapes. In a community setting, however, we are taught to prevent fire. But, what about the edges of towns and cities where homes are spaced far apart and situated among trees and other combustible vegetation; where fire played a historic role in shaping the landscape?

More and more, managing this rural/urban interface is a challenge. Rural residential landowners build houses in the interface area for privacy and scenic views. These very qualities, which attract them to the interface, also increase fire risk: open grass meadows lined with unmanaged riparian areas; a nice home in the trees with a big wooden deck, stacks of firewood nearby; a yard filled with pine needles; and outbuildings filled with hay for the horses.

The benefits of interface living usually don’t come with the same conveniences of city living. City living promises fire control and speedy emergency response times. Living outside city limits, typically, means longer response times, limited manpower, water supplies, and firefighting equipment. Part of the attraction to rural residential living is living in a secluded location. But in the event of a fire, it is essential that firefighters can find homes, have access to defend them, have the available resources, such as water, and that homeowners can safely evacuate if necessary. Inhibiting fire in the interface allows fuel to build. While sometimes caused by lightning, most wildfires – nine out of 10 – are caused by people, who are beginning to dominate interface areas.

The good news is that home sites in the interface can be both firewise (knowledgeable and prepared for wildfire) and compatible with the area’s ecosystem. It is essential that landowners in the interface area understand fire and reduce their vulnerability within their “home ignition zone” – the house and its immediate surroundings up to 100 to 200 feet. Within

“Firefighters are in the business of putting out fires, not getting hurt... We are not going to take a risk that could damage a firefighter or equipment.”


Structural damage from a 2003 aspen fire in Arizona.

Original photo courtesy Jack Cohen, Forest Service Fire Sciences Laboratory.
Most conservation measures, including agroforestry practices, plan for and manage movement – the movement of wind or water; the movement of nutrients, chemicals, soil particles; the movement of livestock, wildlife, pathogens or invasive species. Understanding how things move allows planners to meet landowner objectives and larger societal objectives, such as cleaner air and water. The larger societal objectives cannot be achieved working with a single landowner; it is the cumulative effect of conservation measures on multiple lands that makes a difference. Even rural residential landowners have the potential to affect these larger societal objectives.

Movement occurs at different scales, from the microbial scale to the landscape scale, which can cover many square miles. Planners need to look at these different scales to understand how things move onto, within and through the site. Looking at how an acreage fits into the larger landscape provides valuable information to help address off-site societal concerns. This larger context will also help to determine the feasibility for some landowner goals. For cropland is the dominant land use, or matrix, and the management of annual crops dominates how things move in this landscape. The cropland matrix is dissected by patches of grassland and building sites. Corridors are formed by roads, grassed field borders, and riparian vegetation.

Cropland, woodland and grassland are interspersed across the landscape in a patchwork or mosaic pattern in this landscape. Movement in a mosaic is more difficult to assess than a matrix dominant landscape. The complex pattern creates greater diversity that influences movement.
Here is the same site in context of the larger landscape. The matrix at this scale is row-crop agriculture, indicated by lighter areas. The 15 acre site (marked by the arrow) is part of a wooded riparian corridor (indicated by the darker areas). We begin to see how water and wildlife might move at this scale. The site and larger corridor may also act as a barrier or filter for some nutrients that are moving off of the cropland matrix. Nutrients, along with flora and fauna, may also be moving along the riparian corridor. These insights help an individual landowner to plan for societal water and air quality issues. What is upstream and upwind of the site will have an effect on the site. Furthermore, the site will have an effect on land that is downstream and downwind.

To illustrate how to look at landscape patterns at different scales when working with rural residential landowners, here is an example from the Midwest. First, let’s look at an aerial photo of the 15 acre site and the immediate surroundings. At this scale, we see that the matrix has a woodland cover type with patches and corridors of grass. We don’t know the species type or condition of the cover type, but we can still gain some insight on how this landscape functions. There are different: infiltration and runoff rates; nutrient and material cycles; and types of organisms present in each unit. Wind and water energy vary between the different cover types. We can see major pathways created by concentrated water and by man-made corridors.

When landowners, like musicians, work in concert with one another, they can yield results far more productive and harmonious than when working alone or against one another.

example, a landowner may want certain wildlife, but the site may be too isolated from existing wildlife populations.

Planners do not have the luxury or the resources to investigate all movement that occurs in the planning area, so prioritizing which things to investigate in more detail is critical. Looking at how the landscape is arranged at different scales provides a conceptual overview on how things move. This overview can then be used to determine what needs to be studied in more detail.

Similar processes occur in similar land cover types. Looking at the seasonal patterns created by homogenous land cover units in aerial photographs or digital orthoquads provides a framework for analysis. The shape and size of these units influence movement within and between units. When there is a clear dominance of a land cover, it is called the matrix (Figure A). The matrix sets the foundation for the dominant processes that occur in the landscape. Subordinate types of land cover will create patches and corridors within the matrix. Rural residential development often functions as a patch within a cropland or forestland matrix. If there is no dominant cover type then the landscape pattern is called a mosaic (Figure B).

Once the matrix, patches and corridors have been delineated, movement of things within and between them can be considered. Each unit can be assessed on how it is functioning as a source, sink or habitat for materials, energy, or organisms. Patches and corridors can also function as barriers, filters and conduits.

This technique can be used at different scales. The closer the aerial photograph, the more valuable the information can be for analyzing movement on the site. Larger scale photographs are valuable for analyzing how the site functions in the larger landscape. Making landowners aware of these off-site relationships can help educate them about the importance of their management decisions.

Computers now make it practical to gain a landscape perspective. Aerial photographs and satellite imagery are readily available over the internet. Software is also available to help delineate land cover. Next time you work with a landowner, don't forget to take a landscape perspective.
Firewise
continued from page 5

this area, the vegetation should be modified to reduce threats, slow down and cool approaching fires, and provide space for available firefighters to effectively defend the house. Rural residential homeowners typically own and manage land for its amenity values rather than its productive value. They usually want to do the “right” thing, they just don’t know what that is. The majority of homeowners will endorse firewise suggestions, if given the opportunity.

Maintaining a firewise landscape is similar for both forested parts of the country and the prairie and includes limiting the level of flammable vegetation and materials surrounding the home and increasing the moisture content of the remaining vegetation. In addition to integrating defensive space into landscape design, it is important to reduce understory fuels and increase the use of fuelbreaks. In forested parts of the country, silvopasture and alley cropping can help lessen the understory vegetation fuel load. Prairie wildfires can be deceptively dangerous. They are susceptible to subtle changes in weather and a small smoldering brush pile can blow up into a raging wall of fire with slight changes in wind and humidity. Here, vegetative fire breaks around properties can help slow the spread of fire, giving rural firefighters an opportunity to defend isolated, scattered homesites. Vegetative firebreaks, like a specially designed windbreak, can change the fuel type between the grassed area and the area to be protected. It includes a strip of grass to reduce flame heights, a strip of bare ground meant to eliminate wildfire fuels, and incorporates less flammable species into the design. Keep in mind that the home ignition zone includes the home, which ought to include nonflammable construction materials and a resistant building design.

For even greater impact, consider working with a group of neighbors to create a Firewise zone. Voluntary wildfire mitigation and prevention can be more successful with neighborhood involvement so that all homes and properties are safer and one will not jeopardize the safety of others. In addition to individual homeowners, work with the fire department, city planners, and developers to create firewise plans.

For more information on Firewise practices, grant and funding sources, and low-flammability plants visit www.firewise.org.

ATTRA

Are you working with a landowner, or do you know of one, who is full of questions and ideas about things like mushrooms, walnuts, and goat milk? As the number of small farms increases, so do the number of unconventional farmers who are seeking a career or lifestyle change, or perhaps, trying to save the family farm. Specialty crops and livestock, from heirloom apples to bison, and value-added products like jellies made from home-grown berries, are niche markets which mean less competition and higher returns than traditional large farm commodity crop farming.

If you want to catch up on the latest news in sustainable agriculture and organic farming, including funding opportunities visit the National Sustainable Agriculture Information Service website, www.attra.org (or ATTRA-Appropriate Technology Transfer for Rural Areas). Their website offers publications on production practices, alternative crop and livestock enterprises, innovative marketing, organic certification, and highlights local, regional, USDA, and other federal sustainable agriculture activities. They also have resource lists to help you find equipment, materials, and supplies. If you need more in-depth information or have specific questions, you can contact one of ATTRA’s Program Specialists. If necessary, your question will be assigned to an agriculture specialist, who will research the topic and prepare a report.

They have offices in Butte, Montana; Fayetteville, Arkansas; and Davis, California. You can contact ATTRA via their website, www.attra.org or by calling 800-346-9140 or 800-411-3222 (Spanish-language help line).
At the rural/urban interface there are an ever-increasing number of factors that can limit the establishment of agroforestry practices or that can be negatively impacted by these practices. Some of these factors are man-made structures, some are man-made regulations, and some are factors related to the surrounding environment. The following is a checklist that conservation professionals may wish to review with the landowner while planning and designing agroforestry practices for an acreage or small farm owner living near the rural/urban interface.

**Infrastructure**

**Utilities**

- Planting trees and shrubs may be restricted near underground and overhead utilities. Contact local utilities for easement conditions and to locate buried utilities.
- Plan for a treeless buffer around septic drainage lines, fields and lagoons.

**Roads & access lanes**

- Locate trees and shrubs so that fire and rescue vehicles have easy access to home and buildings.
- Keep shade off travel lanes in winter months to reduce snow and ice hazards.
- Keep trees from blocking the view at road intersections.
- Minimize crossing through windbreaks with driveways or access lanes. Gaps in windbreaks will reduce effectiveness. If not properly oriented, lanes cutting through windbreaks are easily drifted full of snow.

**Buildings and other facilities**

- Tree plantings upwind of buildings can fix or create snow drift problems.
- Reduce fire hazard by keeping trees a safe distance from buildings. Use Firewise planning guidelines for locating landscape trees as well as agroforestry plantings.
- Avoid possible roof and foundation damage by planting trees far enough away from buildings.
- Locate trees so they don't shade buildings during winter months in colder climates. Some homes may be designed to collect solar radiation in winter months.
- Keep solar collectors for electric fences and home solar power free of shade.
- Gardens and other small production areas can be affected by shade. Trees can reduce intense summer heat or create too much shade for some garden vegetables and flowers or specialty crops.

**Regulatory restrictions**

- Contact local authorities to determine if the site is in a water quantity or quality, air quality, wellhead protection, or other special districts that could restrict land management activities.
- Check local zoning and covenant regulations that can limit land management activities such as agriculture, roadside retail stands, or forestry.
- Check local zoning ordinances for possible setback distances for trees and shrubs from right-of-way or property boundaries.
**Environmental factors**

**Soils**
- Check soils map for limiting soil conditions such as internal drainage, high pH, soil texture, and shallow soil that can limit tree species selection.
- Presence of disturbed soils such as borrow sites, gravel quarries, building sites, and reservoir construction areas can create restrictive soil conditions.

**Wildlife & livestock**
- Presence of threatened & endangered species may influence planting of trees and shrubs.
- Make sure desired wildlife species will tolerate trees.
- Protect trees and shrubs from wildlife, such as rabbits, deer, beavers, as well as domesticated livestock.
- Consider whether potentially nuisance species such as deer, starlings, etc. will be attracted by trees and shrubs.
- Make sure trees don’t restrict seasonal winds that can cool livestock during hot months.

**Wetlands, streams, & water**
- Make sure trees in or near drainage ways do not restrict flow.
- Wetland management goals may be incompatible with tree plantings.
- Determine irrigation needs (if any) for establishing or maintaining trees and shrubs. Irrigation may require more water and pressure than the landowner’s well can provide along with daily water needs.
- Make sure suitable tree and shrub species are selected for flood prone areas.
- Keep trees off dams and dikes.
- Protect sensitive areas from sedimentation due to site preparation and planting of trees.
- Check pesticide use label for restrictions when considering use near streams and wetlands.

**Seasonal wind direction**
- Determine dominant winter wind direction to design tree and shrub plantings to achieve snow deposition goals for roads, work areas, and around buildings.
- Determine dominant summer wind direction to avoid restricting cooling breezes in work areas and living spaces.

**Social issues**
- Local traffic could increase as a result of roadside stands, or in-home retail business. Along with business zoning the landowner should consider how tolerant neighbors are towards increased traffic.
- Desirable landscape views for you or your neighbors. Landowners may have to make trade-offs between benefits of a tree planting and the loss of a view of the landscape.
- Plan for adequate space for maintenance between trees and boundary fences. Access for fence maintenance includes the mature width of the trees and width of equipment such as pickups or tractors.
- Determine if drifting snow from trees can encroach onto neighboring fields, houses or access lanes. A tree planting that is not intended for snow management can create off-site snow drifts.
- Determine if existing neighboring trees and windbreaks will drift snow onto the landowner's property.
- Plant species that are tolerant of pesticides if pesticide drift from neighboring fields could be a problem.
- Develop a plan for managing potential invasive or noxious weeds.
- Use tree and shrub species that are not likely to spread to adjoining properties.
- Consider if your tree and shrub plantings may attract wildlife or diseases that may be detrimental to neighboring gardens or crops.
Reforestation
continued from page 4

“plan” will be provided to each participant. The plan offers free project design and planting, including: site preparation, plant materials, and shelters for deer protection;

4. Train landowners to monitor the reforestation project;

After this, landowners maintain the project. If necessary, mowing is allowed to control invasive vines though only one fall mowing is recommended. Landowners are encouraged to reduce mowing over time as tree growth and shade increase.

The survival rate for existing DEPRM projects on public lands is 80 to 90 percent, so they are confident that this approach can work on private lands, too. Previous work is based on years of county-wide reforestation experience using developer fees-in-lieu of mitigation under the 1991 State-mandated Forest Conservation Act.

Two pilot residential reforestation projects were completed in the fall of 2005. One project added 5.2 acres of forest on four rural lots, increasing forest cover by 44 percent. The second project involves 12 property owners and has added 16.7 acres of forest, a 229 percent increase over existing forest acreage.

Baltimore County’s RRSI is demonstrating that technical assistance, financial assistance, and the prospect of having less area to mow provide compelling incentives for neighbors in rural residential subdivisions to add significant areas of forest to their development.

Ecobelts
continued from page 3

fully managed, useful products can be harvested from ecobelts. These may include nuts, berries, natural herbs, and horticultural materials for the floral industry.

• Landscape linkages – Ecobelts should not be created as isolated elements in the landscape but as part of the green infrastructure (see on Harmony on the landscape on page 6).

• Economic, social, and ecological integration – When ecobelts address goals in all three areas they become a desired part of the larger sustainable community.

Natural resource professionals are uniquely positioned to transform the rural/urban tension zone into an area of shared ownership and use through education and technical assistance that leads to the implementation of ecobelts.

Adapted from Creating Viable Living Linkages Between Farms and Communities: Ecobelts at the Rural/Urban Interface (Schoeneberger, Bentrup, Francis, Straight, 2004).

Know a landowner who loves working with children?

Encourage him or her to include children in their Working Trees planning. Kids of all ages love to “get their hands dirty.” Hands-on activities like tree and shrub planting and woody floral harvesting provides opportunities for them to learn about nature. If the landowner sells products, the kids might learn about running a business, too - working at the farmer’s market, selling products, and working with people.
Upcoming Events

March 11, 2006
Tri-State Forest Stewardship Conference. Sinisinawa, WI. Contact: Peggy Compton, 608–342–1633, peggy.compton@ces.uwex.edu.

March 27–30, 2006

March 31–April 1, 2006

May 14–17, 2006

July 22–26, 2006

USDA National Agroforestry Center
East Campus–UNL
Lincoln, NE 68583–0822

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The USDA National Agroforestry Center (NAC) is a partnership of the Forest Service (Research and Development and State and Private Forestry) and the Natural Resources Conservation Service. It is administered by the Forest Service, Southern Research Station; and its program manager and headquarters are located in Huntsville, AL, on the campus of Alabama A&M University, while its research, clearinghouse, and technology transfer staff are concentrated in Lincoln, NE, at the University of Nebraska. NAC’s purpose is to accelerate the development and application of agroforestry technologies to attain more economically, environmentally, and socially sustainable land use systems. To accomplish its mission, NAC interacts with a national network of partners and cooperators to conduct research, develop technologies and tools, establish demonstrations, and provide useful information to natural resource professionals.

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