

## **SUSTAINABLE DEVELOPMENT of FORESTLANDS: Subdivision Planning/Design to Protect Forest Ecosystems and Water Quality in the Mountains of Virginia**

### **Descriptive Narrative:**

This Urban and Community Forestry Assistance Grant will allow Virginia Tech (VPI&SU) and its partners to develop a series of educational tools highlighting the benefits of conservation-based residential developments in the mountains of western Virginia. The project will help communities within Virginia's New River region sustain farms and forests, minimize habitat fragmentation, retain high-quality views and water quality, and protect valued human resources.

Specific project goals are to: 1) educate stakeholders and the public about ways to protect forestland and its associated values; and 2) recommend tools and techniques that will enable developers to implement conservation-based designs in or near forested areas with minimum disturbance to forests, streams and watersheds. Our primary audience will be planners, designers, engineers, developers, landowners, real-estate professionals, and investors, with a secondary audience of local officials and administrators.

Phase I of this project will illustrate the advantages of "conservation-based planning/design" – drawing upon examples from environmentally sound subdivision developments implemented on or near forested mountain ecosystems in southwest Virginia and other regions. Grant funds will enable VPI&SU and our local partners to promote "forest-conserving subdivision developments" within the New River Watershed and other mountainous areas of Virginia. Subdivision development guidelines and exemplary subdivision designs will highlight the benefits of protecting sensitive mountain slopes, retaining the integrity of surface and ground waters, safeguarding sensitive habitats, and maintaining well-functioning forests in perpetuity. These guidelines will address ways to integrate economic and social concerns, wildfire controls, and low-impact-development tools/techniques into mountainous forestland developments.

Subdivision development guidelines and model subdivision plans will be posted on the Internet for access by the wide range of people working in land development, thus helping local officials and code reviewers/administrators. Stakeholder development will be undertaken and our multi-disciplinary Advisory Group will discuss tools for effective outreach/education. Project partners include a dozen faculty members at Virginia Tech, rural planning consultant Donald Chance, the New River-Highlands Resource Conservation & Development Council, New River Valley Planning District Commission, Montgomery County, The Town of Blacksburg, Giles County, New River Land Trust, Foresters Incorporated, and local developers. Other groups, such as the New River Roundtable and Soil & Water Conservation Districts are also expected to play a role.

A draft "conservation subdivision design and development" brochure will be developed and the initial brochure disseminated for comment via the Internet in portable document format (PDF). A final brochure, regional stakeholder workshop, and draft subdivision regulations are expected as part of future activities (see below) to further support forestland conservation.

Future (Phase II) Work: As a follow-up to Phase I research and outreach efforts, our partnership will educate a much larger body of stakeholders about methods of forested mountain protection by producing draft subdivision regulations, an educational workbook, and a refined brochure with a CD-ROM companion. We will also hold a workshop where stakeholders will discuss ways to effectively implement sustainable developments on forestlands.

## Activities

We will undertake the following activities to complete Phase I of this two-stage project:

- 1) ***Sustainable Forestland Development Research*** includes reviewing and synthesizing recent forestry, ecology and planning/design/development literature as well as evaluating existing ordinances, regulations, guidelines and development projects to develop guidelines for planned unit developments and subdivisions in mountainous areas of Virginia. The project team has a large research database available for review. Lee Skabelund, Donald Chance and a planning/design student will lead the research effort – working closely with VPI&SU faculty and our local partners. Literature, ordinances and project reviews will be done with the intent of developing **practical guidelines** for local officials, planners, designers, engineers, developers, landowners, real-estate professionals, and other interested citizens. Environmental, social, and economic factors will be accounted during our research effort during the summer and early fall of 2004.
- 2) ***Demonstration of Sustainable Forestland Planning/Design*** includes preparing a model subdivision design that explicitly accounts for the conservation of important habitats, protects surface and groundwater quality, preserves valued scenic and recreational attributes, sustains forests through time by judiciously using timber, firewood and other non-timber forest products and services, and meaningfully addresses safety, livability and other important socio-economic concerns. Lee Skabelund, Scott Kennedy, and a planning/design student will apply the team’s “working guidelines” (prepared during Step 1) to develop a **model development plan** for a specific site in southwest Virginia. Ecological, social, and economic values will be accounted for at multiple scales (landscape/region, county, community, neighborhood, and site) using GIS and other planning and design tools to support the effort. Existing infrastructure and feasible development technologies will be considered during design. The project team will also perform watershed and habitat evaluations and account for potential opportunities, constraints and hazards. Working through this process with local planners, engineers and developers will provide “reality checks” and lead to the development of highly-useable principles and guidelines.
- 3) ***Development of Urban Forest Protection Guidelines*** will be grounded by our initial literature review and refined by preparing a “model subdivision plan” on a forested site. Following several reviews by the project team and its Advisory Group a more formal set of *Guidelines for Subdivision Development in Forestlands* will be prepared for distribution.
- 4) ***Technology Transfer*** to a wider audience includes sharing ideas about the use of principles and tools related to Landscape Ecology, Watershed & Habitat Evaluation, Low Impact Development, Hazard Reduction, and Adaptive Land Planning & Management for forested sites. The project will highlight ways that GIS, gap analysis (GAP), site and development simulations, ecological assessments, and land valuation tools can be effectively employed in the fast-paced planning/design/development field.
- 5) ***Publications and Communication*** includes education/outreach via the Internet – with a primary audience of planners, designers, engineers, developers, real-estate professionals, landowners and investors, and a secondary audience of local officials and administrators.

We envision a second project in 2005-06 (Phase II), as a follow up to 2004-05 project efforts. Phase II would likely include development of **draft subdivision regulations** that can be considered and used by localities to increase forest protection; a **workshop** to discuss these regulations; an **educational workbook** which can be used in subsequent workshops and seminars; and a **brochure and CD-ROM companion** that will be useful for all who are involved in subdivision development related to forested ecosystems.

## **Partnerships and Participants**

Project personnel, volunteers, corporate sponsors, and participating organizations include Virginia Tech faculty (representing more than a half-dozen disciplines), as well as the New River Valley Planning District Commission, New-River Highlands RC&D, Town of Blacksburg, Montgomery County, Giles County, New River Land Trust, relevant state agency staff, and professional planners, designers, engineers, foresters and developers.

### **Strengths and qualifications of the project team, and nature of partner contributions:**

**Virginia Tech (VPI&SU)** is the Commonwealth of Virginia's land-grant institution. A diverse body of planners, designers, and scientists (including planners, designers, engineers, biologists, foresters, soil scientists, and specialists in urban forestry, non-timber products, conservation, fisheries, wildlife and environmental law) are willing to apply their knowledge to address development issues in Virginia's forestlands. *Role: research and assessment; planning/design & design reviews; education/outreach; and website development.*

The **Town of Blacksburg Department of Planning & Engineering, Montgomery County Department of Planning & Inspections, and Giles County Board of Supervisors** are responsible for reviewing and approving developments/uses that occur within forestland ecosystems and adjacent landscapes. *Role: provide design reviews and planning & education/outreach/communication support.*

The **New River Land Trust** is interested in maximizing conservation within watersheds and forests throughout the New River Valley, while meeting landowner goals for their properties. *Role: provide design reviews and planning & education/outreach/communication support.*

**Virginia's Department of Conservation & Recreation (DCR), Department of Environmental Quality (DEQ), Department of Game & Inland Fisheries (DGIF), and Department of Forestry (DOF)** play vital roles in protecting natural systems throughout Virginia; these agencies have expertise in the following: inventory, analysis, planning, education, and monitoring. *Role: technical support, including planning & education support.*

**Southwest Virginia Developers and Professional Planners/Designers, Engineers & Foresters** are critical stakeholders and play an integral role in creating new subdivisions in the region. *Role: provide design reviews, and support education/outreach/communication efforts.*

## **Administration**

Lee R. Skabelund, Principal Investigator and Project Manager will be responsible for day-to-day project management and record keeping. He will be supported by Scott Kennedy and Donald Chance, with critical input provided by more than 20 other professionals in the region.

Virginia Tech's Office of Sponsored Programs will oversee financial management.

## **Facilities and equipment**

VPI&SU office space, computer equipment, and research facilities will be the primary facilities and equipment used to complete this research project. The Department of Landscape Architecture at Virginia Tech has a Research Lab that houses maps, drafting tables/supplies, digital cameras, GPS units, computers, GIS/CAD/publishing and other software, large-format plotters and scanners, copiers and printers, and a web server. Information will be regularly shared via phone and email. Galleries and conference rooms are available at Virginia Tech and at partner offices for necessary meetings and planning/design reviews.

## **Timetable**

Discussions for this project were initiated in 2002 when the New River Land Trust (NRLT) discussed with local developers Steve Bodtke and Bill Ellenbogen the NRLT's willingness to hold a conservation easement on forestland for their proposed subdivision at Coal Bank Ridge. In partnership with VPI&SU the NRLT presented earlier project proposals to VDOF. In 2003, Paul Revell indicated that the project was a high priority to VDOF-U&CF (Obenshain, p.c.).

Formal project work will begin on June 1, 2004. A literature review and case study review will allow the project team to develop a list of "working" guidelines for sustainable forestland development. These guidelines will be used to prepare a "model" subdivision design for a forested site in the New River Valley. The process of holistic and integrative design will allow the project team to refine the development guidelines and create an important reference for localities, landowners, developers, planners, designers, engineers and others to learn from. Project documents will be archived on a website for easy access by interested parties. All project work will be completed and U&CF-allocated funds spent by May 30, 2005.

***Project start date:*** June 1, 2004.

### ***Major project milestones:***

September 30, 2004 – completed literature/case study reviews; "working" guidelines developed;  
January 10, 2005 – preliminary subdivision plan developed for review by project partners;  
March 30, 2005 – completed development guidelines and refined "model" subdivision design;  
May 20, 2005 – completed web site development; project documents accessible to all as PDFs.

***End of project (final completion date):*** May 30, 2005

## **End product/results**

**Phase I** deliverables to be accomplished with VDOF-U&CF and matching funds include:

- 1) a ***literature review*** and ***assessment of two or more existing subdivision developments*** in the region (with additional developments reviewed as time allows);
- 2) the development of ***guidelines for forestlands in mountainous regions*** drawing ideas from the literature and case study reviews;
- 3) a ***"model" subdivision design*** (including a discussion of landscape-scale parameters, the community and regulatory context, an opportunities and constraints analysis, alternative development scenarios, a detailed discussion of design goals and objectives, use of appropriate low-impact design/development tools/techniques, and a summary of lessons learned)
- 4) a ***website*** (where Phase I project documents and findings can be readily accessed, and where Phase II and other future work can subsequently be archived and shared).

The target audience for project deliverables includes: engineers, designers, planners, developers, real-estate professionals, landowners, investors, local officials and administrators.

**Phase II** will allow for the translation of Phase I efforts into a ***model subdivision ordinance***, highlighting performance standards for sustainable forestland development. A regional ***workshop*** will publicize project findings and help create the dialogue necessary for local adaptation and application. The publication of an ***educational workbook, brochure and CD-ROM companion*** will be useful products for all stakeholders involved in land use planning, design and development, as well as forestland management.

## **Qualifications of the Applicant**

VPI&SU and its partners are well-qualified to carry out the project and will be led by:

### ***Lee R. Skabelund, Assistant Research Professor of Landscape Architecture at VPI&SU***

Lee has taught graduate and undergraduate courses in Landscape Ecology, Land Analysis & Site Planning, Landscape Planning & Management (studios), and Environmental Impact Assessment. He is Principal Investigator for the New River Parkway Environmental Assessment. He served five years as Director of the Community Design Assistance Center at Virginia Tech. Lee received a BLA from the Department of Landscape Architecture & Environmental Planning at Utah State University and an MLA from the School of Natural Resources & Environment at The University of Michigan. He has worked in public and private practice as a planner/designer. Since 1993 Lee has coordinated work to complete the New River Parkway Environmental Impact Statement for agency and public reviews. To accomplish this work, he has written nine proposals with budgets totaling more than two million dollars. In collaboration with planners, engineers, biologists, historians and archaeologists, he has helped evolve a parkway design that minimizes impacts to land and people by fitting designs to the area's natural and cultural patterns.

### ***Donald Chance, Planning Consultant; Adjunct Faculty, Urban Affairs & Planning, VPI&SU***

Donald (forester and planner) worked for more than 30 years on rural planning issues in the Northwest (U.S.) and has closely examined housing and village patterns in England and Germany. He is currently developing Nanny Catch Commons, a conservation-based residential community in Giles County.

### ***R. Scott Kennedy, Assistant Research Professor of Landscape Architecture at VPI&SU***

Scott (B.S. Arch. & MLA) has experience in land planning/design, architecture and building construction, and natural, visual and cultural resource mitigation/management. He has extensive knowledge of Geographic Information Systems, Computer-Aided Design, and Site Simulation technologies.

## **The following VPI&SU Faculty will share ideas for the literature review; comment on subdivision development guidelines; and review model subdivision designs:**

Walter Lee Daniels, Professor (Geomorphology, Land Use & Soil Science)

Dean Stauffer, Associate Professor (Habitat Evaluation & Wildlife Management)

Brian Kane, Assistant Professor (Arboriculture & Urban Forest Management)

Jeff Waldon & Julie McCafferty, Conservation Management Institute (Wildlife/Human Ecology)

Tom Hammett, Associate Professor (Niche Markets for Non-Timber Forest Products)

John Seiler, Professor (Water, Pollution & Environmental Stressors on Woody Plants/Forests)

John Randolph, Professor (Energy Conservation, Engineering & Environmental Planning)

Jesse Richardson, Associate Professor (Environmental Law & Land Use Planning)

Diane Zahm, Associate Professor (Zoning/Regulations & Comprehensive Land Use Planning)

Dean Bork, Associate Professor (Site Planning/Design/Development & Landscape Architecture)

## **Project Partners**

***New River-Highlands RC&D*** – Gary Boring & Joe Gorman (resource planning/management)

***New River Valley PDC*** – David Rundgren and Lydeana Martin (community development)

***Montgomery County Planning & Inspections*** – Joe Powers & Steve Sandy (land planning)

***Town of Blacksburg Planning & Engineering*** – Meredith Tremel (civil engineering)

***New River Land Trust (NRLT)*** – Elizabeth Obenshain, Exec. Director (ag-forest conservation)

Jerry Moles, Global Renaissance LLC (conservation planning & community facilitation)

## **Development Reviewers will involve the following local developers & foresters:**

Bill Ellenbogen (Coal Bank Ridge – a forested subdivision with conservation easement)

Joyce Graham (Village at Toms Creek – a conservation-based cluster design in Blacksburg)

Britt Boucher, Foresters Incorporated (a local forest planning/use/management business)