

NATURAL RESOURCE MANAGEMENT

Desktop planning for conservation practices

By LYNN BETTS

DESKTOP planning for conservation practices got off to a good start in some states a little more than a year ago when online computer programs called PondBuilder and BasinBuilder were introduced to conservationists who plan and design conservation practices for farmers and ranchers.

The programs were touted for significant time savings in their ability to locate a proposed practice on the landscape and to generate an accurate cost estimate. The one-of-a-kind PondBuilder, for instance, can place a proposed pond in the landscape, generate an aerial photo with the pond's permanent and temporary pool areas clearly drawn, estimate the cubic yards of earth-moving and size and length of pipe needed, and generate an accurate cost estimate in less than 15 minutes.

That rapid turnaround time compares to several months using current methods in most of the country, where it takes time for conservationists in the USDA field offices to schedule and make a site visit for preliminary surveys, then take more time upon return to the office to make the calculations for sizes and costs.



STAN BUMAN

Key Points

- Online software offers time savings and accuracy in conservation planning.
- New programs help plan and estimate costs for waterways and wetlands.
- The programs can only be used in counties with LiDAR information available.

WetlandBuilder, WaterwayBuilder

Now, the company behind the first two programs is introducing online planning programs for two more practices, waterways and restored wetlands. WetlandBuilder works much like PondBuilder, locating the dike on an aerial map, estimating costs for pipe and building the dike, and drawing a pool area. In addition, it uses shades of blue to show projected water depth in the wetland at levels of 0-1 foot, 1-2 feet, 2-4 feet, and greater than 4 feet over the entire pool area (providing you don't move earth from the wetland area to build the dike).

There's no limit on the drainage area size for the online tool, but it works for dikes only as high as 10 feet, because side slopes, spillways and other features change when a dam exceeds 10 feet. Dams higher than that use the PondBuilder program.

"If you have two low spots in an area you are reconstructing as a wetland, you might want to put in two dikes. This pro-

gram will accommodate multiple dikes and saves even more time," says Stan Buman of Agren, the company from Carroll, Iowa, at which he's developing the suite of online planning programs for more than half a dozen conservation practices.

All the programs use Light Detection and Ranging, or LiDAR, elevation data that's being made available county by county by government agencies. LiDAR is the key to online planning; programs are available for use only in counties that have made LiDAR available. LiDAR's three-dimension location and elevation sketches — accurate to within a foot in most terrain — save time from traditional on-site land surveys for planning purposes.

Buman expects WaterwayBuilder to have even broader appeal than PondBuilder or WetlandBuilder. More waterways are built across the country than ponds or wetlands, and the potential time savings in waterway estimates are as great or maybe even greater than with the other programs, Buman says.

"Again, the program takes away the need for the time involved in scheduling and making the field survey initially. The engineering in the program embeds the newest science, the [Natural Resources Conservation Service] 'effective stress approach' design, in its calculations. It handles parabolic, trapezoidal and even V-shaped waterways. When I talk with states, it's one of the tools they're most interested in," Buman says.

Programs save on labor

In Iowa, where conservation districts from



LANDSCAPE LOCATION:

WaterwayBuilder will locate the centerline of the proposed waterway on an aerial map, measure its length and show multiple reaches.

32 counties are licensed to use all the programs until June 15, 2013, conservation agencies see the programs as a way to cope with realities of either holding their own or dealing with reductions in field employees for conservation planning and application.

One license makes all the Internet-based tools available to the district.

WetlandBuilder is available now, and WaterwayBuilder is expected to be available in licensed counties by March or April.

"The tools will help us make better use of LiDAR technology and the people we have in the field. Using them is good for all of us — the state and federal agencies, local districts, and landowners. As we get more of the pieces added, including terraces, they will be even better," says Jim Gillespie of the Iowa Department of Agriculture and Land Stewardship.

The state conservationist for NRCS in Iowa, Rich Sims, appreciates the time savings but is equally impressed with the accuracy of cost estimates, which saves even more time as contracts for conservation measures don't need to be modified when the practices are built.

That's what Buman hears from people who have used the tools or watched demonstrations of their use.

"What we hear they like about the programs that are in use now is that they offer fast and accurate planning, you get multiple planning options quickly, and you get a drawing that shows a landowner how the practice lays on his or her land," explains Buman.

The bottom line is better, faster technical conservation service for landowners.

Logistics, the huge amounts of data and current lack of complete LiDAR coverage are slowing the use of the programs nationwide.

There's clear potential in the future for private planners and conservation contractors to use the programs, Buman believes.

It's cost-prohibitive until a state has the tools set up in all its counties, but once that happens, Buman expects much higher use of the tools by private contractors and conservationists.

Online planning, he says, could one day be the standard.

For more information, contact Buman at stan@agreninc.com or online at agreninc.com/conservation.php.

Betts writes from Johnston, Iowa.



VISUALIZING WETLAND WATER DEPTHS: Screen shots in the WetlandBuilder program are color-coded to show the varying water depths that will be created. The shots also show contour lines and where the dike will be. The program will also draw a boundary for the drainage area of the wetland.