Protecting the Marbled Murrelet in Washington's State Forests with Financial Benefit for All Stakeholders

"Our stakeholders like the transparency of the modeling provided by the spatial utilities and open programming environment. As an analyst, I can show them directly how their concerns for revenues and habitat are built right into the model"

Weikko Jaross
Forest Operations Analyst
State of Washington

The client

The Washington State Department of Natural Resources (DNR) is a state agency that protects and manages more than five million acres of land - forests, farms, commercial properties and underwater lands - to provide benefits to the people of Washington State.

Headquartered in Olympia, the agency manages state lands to support public institutions like schools and universities by selling products like timber and wheat in addition to managing underwater lands and working to serve the continuation of navigation and commerce. In 2005, product sales and leases from the lands the Washington State DNR managed brought in about $271 million.

Managing the lands is only half the story. The agency also protects other public resources that belong to private landowners. Two of its largest and most important responsibilities are fire prevention and suppression and regulating forest practices (or timber harvest). The agency also plays an important role in the conservation of habitat for listed, threatened, and endangered plant and animal species under the Endangered Species Act.

The Opportunity

The state lands arm of Washington State DNR is tasked with several projects that concurrently place high priority demands on timely and effective forest and habitat modeling. These projects involve analyzing the sustainable harvest levels, marbled murrelet long term conservation strategies and Forest Land Planning.

The sustainable harvest calculations cover 2.1 million acres of forest land, and are updated when necessary to address DNR's many forest and habitat management commitments. In doing so, DNR informs its Board of Natural Resources (Board) on expected decadal timber harvest levels and habitat development on State Trust forestlands. The Department's Forest Land Planning focuses on developing management strategies at the tactical level that address specific public use, forestry and habitat conservation needs within each of six planning units.

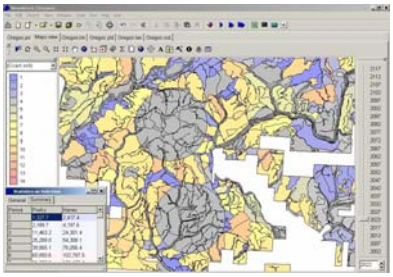
"Beginning in year 2000, we set out to re-develop our internal capacity to do forest and habitat analysis. Our main focus at that time was the development of a Geographic Information System (GIS) process that could provide our analysts with modeling maps and databases. We then turned our attention to computing resources and services," said Weikko Jaross (Weikko), Forest Operations Analyst for the State of Washington. "Remsoft's software solutions were a logical fit with our systems, so we used these systems together to provide timely and informative analyses."

In 2004, Weikko and Scott Horton, a lead biologist on marbled murrelet ecology for DNR, set out to analyze scientific theories supporting long term habitat conservation strategies for the marbled murrelet. The development of a long-term conservation strategy for marbled murrelets is a commitment from a long-term plan first adopted in 1997 and signed by Washington State DNR called a multi-species Habitat Conservation Plan (HCP).

When the HCP was signed, Washington State DNR managers did not have sufficient information about marbled murrelet ecology to create a credible long-term conservation strategy. In the absence of such information, the agency along with the U.S. Fish and Wildlife Service (FWS) and

NOAA Fisheries built an interim strategy for marbled murrelet conservation into the HCP agreement while a long-term strategy was being developed. This interim strategy outlined a step-by-step approach to focus research efforts and conservation measures. Among the steps were:

- Develop predictive models—for each of six large, watershed-based planning units—that help predict the probabilities about which forest stands would be occupied by murrelets.
- Use the predictive computer model to help identify marginal habitat expected to contain a maximum of five percent of occupied sites, and release those areas for other management activities. (No known occupied sites were released; they all were protected.)
- Develop and implement a long-term conservation strategy for each planning unit.



The first two steps were completed prior to 2004. These steps provided the theoretical basis and empirical data for developing predictive models of marbled murrelet habitat preferences, which were integrated into Remsoft's Spatial Woodstock module as yields and were used to inform marbled murrelet scientists when they set out to develop recommendations for a long term conservation strategy for each planning unit.

Washington State DNR again turned to its toolbox of software solutions to find one with the ability to conduct long-range planning and to calculate complex variables for predictive modeling.

The Remsoft Solution

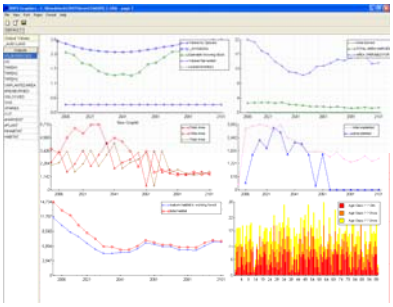
Washington State DNR analysts are using RSPS to provide analyses from many concurrent projects including sustainable harvest calculations, marbled murrelet long term conservation strategy, and Forest Land Planning. DNR has taken a system approach to providing a sound foundation for its analysts.

Weikko and Horton elected to use the Remsoft Spatial Planning System (RSPS) for the marbled murrelet long-term conservation project. This enabled them to forecast future outcomes for the habitat of marbled murrelets using scientific recommendations. Weikko and Horton also are using the RSPS to support Washington State DNR's Forest Land Planning on a coastal conservation planning unit known as the Olympic Experimental State Forest (approximately 265 thousand acres).

In order to ensure the success of their programs at all levels within the DNR using RSPS, Washington State DNR welcomed two Remsoft system engineers to its Olympia facilities for a two-day training seminar. Representatives from DNR, including forest analysts, and experts in geographic information systems (GIS), ecosystem services, marketing, operations and administration participated in the training. The 28 DNR participants used RSPS to run multiple what-if scenarios on a pre-existing model until everyone understood how the system works and how to generate and read modeling reports.

"We are now focused on developing our capacities to provide training to multi-disciplinary teams of analysts, biologists, foresters and planners who will come together to work on forest and habitat analysis projects. Our primary focus from a systems development perspective is creating complex yields systems and sound econometrics. Remsoft's spatial utilities, tutorials, documentation, and training support are what set them apart from other software companies. In all it took three to six months of dedicated time with training and support from Remsoft's customer service to become reasonably proficient with the applications," Weikko said. "Now that we are competent at using RSPS, we like that we can explore ways to improve the effectiveness of our conservation strategies, increase management options, and aide in setting priorities for our forest and habitat research."

In July 2007, Washington State DNR announced that the Board adopted a modified sustainable harvest level for forested state trust lands in Western Washington with a new ten-year sustainable harvest level of 5.5 billion board feet to address decisions made since the Board's 2004 adoption of 5.97 billion board feet as the harvest level for the 2005 to 2014 planning decade. Among the commitments included in this calculation were the implementation of streamside (riparian) forest restoration strategies and strategies to protect critical northern spotted owl habitats. The analysis of alternative marbled murrelet long term conservation strategies is expected to be complete in 2009.



With the announcement, Board Chairman, and Commissioner of Public Lands, Doug Sutherland was quoted as saying, "The Board has taken great care to establish policies that accomplish the best possible habitat conditions to support owls, murrelets, salmon and other native species, while increasing revenue production for schools and other trust beneficiaries. Our improved and faster computer modeling makes it possible to anticipate how changes during the planning decade would affect harvest levels for state forests. This gives the Board the flexibility to modify the level, as appropriate."

The Department's next steps in Forest Land Planning will be digging even further into data, yields, and assumptions at a more tactical level within each of six planning units.

Remsoft's Spatial Planning System software will be the tool used to do the modeling.

"I like to use Remsoft's Analysis Area Control feature, comparing existing and optimal schedules using LP Schedule, and detailed theme features to block harvests into logical operational units. Having capacity to run up to 60,000 constraints allows our analysts to develop very explicit models, and allocating optimal schedules quickly back to the shapefiles using Remsoft's Stanley module provides our foresters with ideas for meeting their short and long-term goals," said Weikko. "Our biggest gains so far have been increased participation with our field foresters and stakeholders as well as being able to effectively advise our managers on complex issues with increased confidence."

"Our stakeholders like the transparency of the modeling provided by the spatial utilities and open programming environment. As an analyst, I can show them directly how their concerns for revenues and habitat are built right into the model," he added.

With its long-range modeling capabilities and open architecture that allows Weikko and his team to transparently and quickly share their data in ways that make it easy to understand, Washington State DNR continues to be successful in getting Board approval to implement its sustainable harvest level plans and to be able to demonstrate strategies that accelerate development of complex older forest structure on state trust lands. While the analysis of the marbled murrelet strategies is not expected to be completed until 2009, the modeling approaches developed so far have been invaluable for informing DNR and its stakeholders about the DNR's potential role in the conservation of the marbled murrelet.

"With Remsoft's applications we have begun to explore ways to improve the effectiveness of our conservation strategies, increase management options, and aide in setting priorities for our forest and habitat research," said Weikko.