

**An independent Biscuit researcher's views on
the Donato Science study of Biscuit post-fire salvage logging
Greg Nagle (Ph.D.¹)
2/14/06**

As an independent researcher who has spent much time monitoring Biscuit post-fire salvage logging I offer these observations about the Donato study recently published in Science². Since January 2003 I have spent 85 days doing field work in the Biscuit fire. Between November 2004 and October 2005 I did a field examination of 90 Biscuit post-fire salvage logging units encompassing about 60% of the total Biscuit sale area of 3658 acres³, including all the areas studied by Donato.

Donato has come under severe, and as I will document, in some cases unsupportable criticism. For example, the letter to the editor of Science from OSU Professor John Sessions, signed by eight other OSU and USFS scientists misrepresents some facts about the study design and aspects of the study area. Specific details of the Donato study were formally presented at a two hour public seminar and open discussion on January 18, 2006 in the OSU College of Forest Resources.

The Donato study documented 767 naturally regenerated conifer seedlings per hectare (310 trees /acre), 70% of these Douglas fir. This simple but very timely study compared regeneration and fuel levels in five sites with plots on unburned, salvaged and unsalvaged ground in four widely dispersed sale areas. Salvage logging significantly reduced conifer seedling numbers by 71% and also increased fine and coarse woody fuel levels (before logging debris was burned). The five large study plots in the four widely dispersed study areas were each set up as four transects reaching out from a central point like the spokes of a wheel. Each of these transects was 75 meters long and one meter wide with the four transects encompassing a total of 300 square meters. This is quite a large area for a single plot and with the length of the transects, many soil microsites within the plots were sampled.

Below are portions of the text (in italics) of the letter⁴ sent by the nine signers of the editor of Science with my responses to these comments.

The inferences drawn by the authors far exceeded their experimental design. The nature of sampling in any research design defines the limits of statistical inference. The authors' statistical design encompasses a very narrow range of field conditions.

The authors conclude that forest regeneration is not in crisis across all burned landscapes, but, in fact, the authors sampled two small areas near the east perimeter of the Biscuit area totaling less than one-half of one percent of the burned area. There are over two dozen plant associations within the Biscuit area. The sampling design does not capture variability across the Biscuit, nor did it identify the plant associations in the study.

The statistical design is far from narrow, on the contrary, the four widely dispersed study areas span a range of climatic zones, super plant association groups and soil parent materials characteristic of the Biscuit salvage units. There were four study areas, not two, each covering large plot areas, and they are not limited to the east perimeter but include one in the east, one in the north central portion and two in the northwest sector three miles apart at different elevations and in different super plant association groups and soil parent materials.

Donato study plot areas with super plant associations and soil parent materials
 (data taken from Map II-7: Super plant association groups and Map C-2: Soils parent material in the Biscuit Final EIS)

Sale areas studied *	Soil parent materials in sale areas	Principal super plant associations in sale areas
Briggs (east)	coarsely crystalline sedimentary	White fir dry Douglas fir dry
Flattop (north central)	coarsely crystalline igneous	White fir dry Ultramafic
Indie (northwest)	metavolcanic	Douglas fir dry
Berry (northwest)	metasiltstone/mudstone and coarsely crystalline igneous	Tanoak moist

*Except for the Briggs 3 unit, I do not know the exact salvage units in each study area that were surveyed by Donato.

Further, much of the geology within the Biscuit Burn consists of ultramafic, plutonic parent rocks. Such parent materials give rise to soils with extremely unusual properties known well to ecologists and soil scientists. While we understand from discussions with the authors that this geology was not sampled, the question will most certainly be raised by careful readers of the article.

Based on the rough map in the Biscuit Final EIS depicting soil parent materials, out of the 220 logging units in Biscuit, I estimate that only 8 units were located on such ultramafic soils which are usually not considered for commercial timber production. While ultramafic soils are common in the general area, they are tangential to this study⁵.

The explicit point of the Donato study was to look at the impacts of the logging, not perform a wide scale sampling of conifer regeneration across all soils and forest types. The study focused on harvest units, it was not intended to be, nor did they have the resources to place many more plots encompassing the entire 500,000 acre burn area.

There are other recent data by other researchers on regeneration from a wider area that have not yet been made available. I briefly examined conifer regeneration in two units of the Steed sale area, directly west of Game Lake Peak in the western part of the burn. With numerous green trees immediately adjacent to the salvage units, conifer regeneration appeared even more robust than in the areas studied by Donato.

In closing, this is a case study, in a specific set of environmental conditions, at a snap shot in time, with a limited set of treatments.

This was a study of tree regeneration and fuels after salvage logging in a specific context, a technique in keeping with most ecological and forestry surveys. In addition, the full range of actual treatments were studied, not some arbitrarily limited set. The Donato researchers studied three helicopter logged units and two cable logged units, the same proportion of treatments across the acreage of the entire 220 logging units.

If we were to start rejecting such ecological research as just “snap shots in time”, few studies would ever see publication. From studies such as Donato’s we hope to gain well supported insights on broader scale and longer term conditions, and reduce decision making’s dependence on ignorance and supposition.

¹ I have a MS/Ph.D. in forest science from the Dept of Natural Resources at Cornell University. After Feb 15, 2006 I can be reached at Cornell University, Dept of Natural Resources, Fernow Hall, Ithaca NY 14853. email: gnagle2000@yahoo.com.

² Donato, D.C. J.B..Fontaine, J.L. Campbell, W.D. Robinson, J.B. Kauffman, B.E. Law. 2006. Post-wildfire logging hinders regeneration and increases fuel risk. www.sciencexpress.org/5 january 2006/Page 1/10.1126/science.1122855.

³ These included the Flattop, Briggs/Cedar, Indie, and Horse matrix sales; and Late Successional Reserve (LSR) sales in the Steed, Berry, McGuire, and Fiddler areas. I can send an email file with my report if contacted at gnagle2000@yahoo.com

⁴ Letter to John Sessions and seven other authors to the editor of Science 1/17/06. Concerns About SCIENCE, January 2006: Post Wildfire Logging Hinders Regeneration and Increases Fire Risk by Donato et al.

⁵ And of these 8 units in ultramafic soils, 3 were in the Cedar sale area on the far eastern edge of the burn with numerous green trees near the sale units where I expect that conifer regeneration was also robust after the last two years with good rainfall.