

## Todd J. Hawbaker

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U.S. Geological Survey  
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### Education

- 2009, PhD Forestry, University of Wisconsin – Madison. Dissertation title: Fire in the wildland-urban interface, a national comparison of patterns of fire occurrence and fire risk to homes.
- 2003, M.S. Forestry, University of Wisconsin – Madison. Thesis title: Road density and landscape pattern in Northern Wisconsin, USA; present and past perspectives on environmental constraints and social drivers.
- 1998, B.S. Animal Ecology, Iowa State University.

### Professional experience

*Research Ecologist* Sep. 2012 - present  
U.S. Geological Survey, Geosciences & Environmental Change Science Center, Denver, CO

*Research Ecologist* Aug. 2008 – Sep. 2012  
U.S. Geological Survey, Rocky Mountain Geographic Science Center, Denver, CO

*Graduate Research Assistant* Sep. 2004 – July 2008  
University of Wisconsin, Department of Forest and Wildlife Ecology, Madison, WI

*Research Intern* Sep. 2003 – Aug. 2004  
University of Wisconsin, Department of Forest Ecology & Management, Madison, WI

*Graduate Research Assistant* Jan. 2001 – Aug. 2003  
University of Wisconsin, Department of Forest Ecology & Management, Madison, WI

*Restoration Ecologist* May 1998 – Dec. 2000  
Salix Ecological Resources, Windom, MN

*Geographic Information Systems Technician*  
Iowa Natural Heritage Foundation, Des Moines, IA Apr. 1998 – May 1998  
Iowa State University, Department of Animal Ecology, Ames, IA Oct. 1997 – Apr. 1997  
Iowa State University, Department of Botany, Ames, IA Oct. 1997 – Dec. 1997

*Software Engineer & UNIX Systems Administrator* May 1993 – Oct. 1997  
Engineering Animation Inc., Ames, IA

*Crew Leader* Summers of 1991 & 1993  
Iowa Conservation Corps, Ames, IA

## Publications

### *In press*

1. **Hawbaker, T.J.**, V.C. Radeloff, S.I. Stewart, R.B. Hammer, N.S. Keuler, and M.K. Clayton. *In press*. Human and biophysical influences on fire occurrence in the United States. *Ecological Applications*.
2. Prestemon, J.P., **T.J. Hawbaker**, M. Bowden, J. Carpenter, M.T. Brooks, K.L. Abt, R. Sutphen, A. Kole Berriochoa, and S. Scranton. *In press*. Wildfire ignitions: A brief review of the science and recommendations for empirical modeling. USDA Forest Service, Southern Research Station, SRS-GTR-XXX.

### *2012 publications*

1. Bar Massada, A., **T. J. Hawbaker**, S. I. Stewart, and V.C. Radeloff. 2012. Combining satellite-based fire observations and ground-based lightning detections to identify lightning fires across the conterminous USA. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*. 99:1-10.
2. Sohl, T.L., B.M. Sleeter, Z. Zhu, K.L. Saylor, S. Bennett, M. Bouchard, R. Reker, **T. Hawbaker**, A. Wein, S. Liu, R. Kanengieter, W. Acevedo. 2012. A land-use and land-cover modeling strategy to support a national assessment of carbon stocks and fluxes. *Applied Geography* 34: 111-124.
3. Zhu, Z., B. Sleeter, G. Griffith, S. Stackpoole, **T. Hawbaker**, and B. Bergamaschi, 2012, Executive Summary of Z. Zhu and B. Reed, eds., Baseline and projected future carbon storage and greenhouse-gas fluxes in ecosystems of the Western United States: U.S. Geological Survey Professional Paper 1797. 192 p. (Also available at <http://pubs.usgs.gov/pp/1797>)
4. Zhu, Z., B. Sleeter, G. Griffith, S. Stackpoole, **T. Hawbaker**, and B. Bergamaschi, 2012, Introduction to Scope, Methodology, and Ecosystems of the Assessment, chapter 1. of Z. Zhu and B. Reed, eds., Baseline and projected future carbon storage and greenhouse-gas fluxes in ecosystems of the Western United States: U.S. Geological Survey Professional Paper 1797. 192 p. (Also available at <http://pubs.usgs.gov/pp/1797>)
5. **Hawbaker, T.**, and Z. Zhu, 2012, Baseline wildland fires and emissions for the Western United States, chapter 3 of Z. Zhu and B. Reed, eds., Baseline and projected future carbon storage and greenhouse-gas fluxes in ecosystems of the Western United States: U.S. Geological Survey Professional Paper 1797. 192 p. (Also available at <http://pubs.usgs.gov/pp/1797>)
6. Liu, S., J. Liu, C. Young, J. Werner, Y. Wu, Z. Li, D. Dahal, J. Oeding, G. Schmidt, T. Sohl, **T. Hawbaker**, and B. Sleeter, 2012, Baseline Carbon Storage, Sequestration and Greenhouse Gas Fluxes of Terrestrial Ecosystems in the Western United States, chapter 5 of Z. Zhu and B. Reed, eds., Baseline and projected future carbon storage and greenhouse-gas fluxes in ecosystems of the Western United States: U.S. Geological Survey Professional Paper 1797. 192 p. (Also available at <http://pubs.usgs.gov/pp/1797>)
7. Wein, A., **T. Hawbaker**, R. Champion, J. Ratliff, B. Sleeter, and Z. Zhu, 2012, Climate projections used for the assessment of the Western United States, chapter 7 of Z. Zhu and B. Reed, eds., Baseline and projected future carbon storage and

greenhouse-gas fluxes in ecosystems of the Western United States: U.S. Geological Survey Professional Paper 1797. 192 p. (Also available at <http://pubs.usgs.gov/pp/1797>)

8. **Hawbaker, T.**, and Z. Zhu, 2012, Projected future wildland fires and emissions for the Western United States, chapter 8 of Z. Zhu and B. Reed, eds., Baseline and projected future carbon storage and greenhouse-gas fluxes in ecosystems of the Western United States: U.S. Geological Survey Professional Paper 1797. 192 p. (Also available at <http://pubs.usgs.gov/pp/1797>)
9. Liu, S., Y. Wu, C. Young, D. Dahal, J. Werner, J. Liu, Z. Li, Z. Tan, G. Schmidt, T. Sohl, **T. Hawbaker**, and B. Sleeter, 2012, Projected Future Carbon Storage and Greenhouse Gas Fluxes of Terrestrial Ecosystems in the Western United States, chapter 9 of Z. Zhu and B. Reed, eds., Baseline and projected future carbon storage and greenhouse-gas fluxes in ecosystems of the Western United States: U.S. Geological Survey Professional Paper 1797. 192 p. (Also available at <http://pubs.usgs.gov/pp/1797>)
10. Liu, S., Z. Zhu, T. Sohl, **T. Hawbaker**, B. Sleeter, S. Stackpoole, and R. Smith, 2012, Toward an Integrated Assessment: Further Analyses and Observations, chapter 12 of Z. Zhu and B. Reed, eds., Baseline and projected future carbon storage and greenhouse-gas fluxes in ecosystems of the Western United States: U.S. Geological Survey Professional Paper 1797. 192 p. (Also available at <http://pubs.usgs.gov/pp/1797>)

#### *2011 publications*

11. Bar Massada, A., A.D. Syphard, V.C. Radeloff, **T.J. Hawbaker**, and S.I. Stewart. 2011. Effects of ignition location models on the burn patterns of simulated wildfires. *Environmental Modeling and Software*, 26:583-592.
12. Gimmi, U., S.L. Schmidt, **T.J. Hawbaker**, C. Alcàntara, U. Gafvert, and V.C. Radeloff. 2011. Road development, building growth, and related fragmentation effects in and around U.S. National Park Service holdings: indicators for the effectiveness of protected areas. *Journal of Environmental Management*, 92:229-239.
13. Lesak, A.A., V.C. Radeloff, **T.J. Hawbaker**, A.M. Pidgeon, T. Gobakken, and K. Contrucci. 2011. Modeling forest songbird species richness using LiDAR-derived forest structure. *Remote Sensing of Environment*, 115(11):2823-2835.
14. Zhiliang Z. (ed), M. Bouchard, D. Butman, **T. Hawbaker**, Z. Li, J. Liu, S. Liu, C. McDonald, R. Reker, K. Sayler, B. Sleeter, T. Sohl, S. Stackpoole, A. Wein, and Z. Zhu. 2011. Baseline and Projected Future Carbon Storage and Greenhouse-Gas Fluxes in the Great Plains Region of the United States. U.S. Geological Survey Profession Paper 1787, 28p.

#### *2010 publications*

15. Freitas, S.R., **T.J. Hawbaker**, and J.P. Metzger, 2010. Effects of roads, topography, and land use on forest cover dynamics in the Brazilian Atlantic Forest. *Forest Ecology and Management*, 259:410-417.

16. **Hawbaker, T.J.**, T. Gobakken, A. Lesak, E. Trømborg, K. Contrucci, and V.C. Radeloff. 2010. LIDAR-based forest inventory of uneven-aged mixed hardwood forests. *Forest Science*, 56:313-326.
17. Radeloff, V.C., S.I. Stewart, **T.J. Hawbaker**, U. Gimmi, A. Pidgeon, C. Flather, R.B. Hammer, and D. Helmers. 2010. Housing growth in and near United States' protected areas limits their conservation value. *Proceedings of the National Academy of Sciences*, 259:410-417.
18. Zhu, Z., ed., B. Bergamaschi, R. Bernknopf, D. Clow, D. Dye, S. Faulkner, W. Forney, R. Gleason, **T. Hawbaker**, J. Liu, S. Liu, S. Prisley, B. Reed, M. Reeves, M. Rollins, B. Sleeter, T. Sohl, S. Stackpoole, S. Stehman, R. Striegl, A. Wein, and Z. Zhu. 2010, Public review draft; A method for assessing carbon stocks, carbon sequestration, and greenhouse-gas fluxes in ecosystems of the United States under present conditions and future scenarios: U.S. Geological Survey Open-File Report 2010–1144, 195 p., available online at <http://pubs.usgs.gov/of/2010/1144/>

*2009 publications*

19. Bar Massada, A., V.C. Radeloff, S.I. Stewart, and **T.J. Hawbaker**. 2009. Wildfire risk in the wildland-urban interface: a simulation study in northwestern Wisconsin. *Forest Ecology and Management*, 258:1990-1999.
20. **Hawbaker, T.J.**, N. Keuler, A. Lesak, T. Gobakken, K. Contrucci, and V.C. Radeloff. 2009. Improved estimates of forest vegetation structure and biomass with a LiDAR-optimized sampling design. *Journal of Geophysical Research*, 114.
21. Hammer, R.B., V.C. Radeloff, S.I. Stewart, and **T.J. Hawbaker**. 2009. Housing growth, forests, and public lands in northern Wisconsin from 1940 to 2000. *Journal of Environmental Management* 90:2690-2698
22. Rogers, D.A., T.P. Rooney, **T.J. Hawbaker**, V.C. Radeloff, D.M. Waller. 2009. Paying the extinction debt and the weakening of the biotic-environmental relationship in southern Wisconsin forests. *Conservation Biology* 22:1497-1506.
23. Syphard, A.D., V.C. Radeloff, **T.J. Hawbaker**, S.I. Stewart. 2009. Conservation threats due to human-caused increases in fire frequency in Mediterranean-climate ecosystems. *Conservation Biology* 23:758-769.
24. Stewart, S.I., B. Wilmer, R.B. Hammer, G.H. Aplet, **T.J. Hawbaker**, C. Miller, and V.C. Radeloff. 2009. Wildland-Urban Interface maps vary with purpose and context. *Journal of Forestry* 107:78-83.

*2008 publications*

25. **Hawbaker, T.J.**, V.C. Radeloff, A.D. Syphard, Z. Zhu, and S.I. Stewart. 2008. Detection rates of the MODIS active fire product. *Remote Sensing of Environment* 112:2656-2664.
26. Syphard, A.D., V.C. Radeloff, N.S. Keuler, R.S. Taylor, **T.J. Hawbaker**, S.I. Stewart, and M.K. Clayton. 2008. Predicting spatial patterns of fire in a southern California landscape. *International Journal of Wildland Fire* 17: 602-613.

#### 2007 publications

27. Gonzalez-Abraham, C.E., V.C. Radeloff, R.B. Hammer, **T.J. Hawbaker**, S.I. Stewart, and M.K. Clayton. 2007. Building density and landscape pattern from 1938 to 1998 in northern Wisconsin, USA. *Ecological Applications* 17:2911-2023.
28. Gonzalez-Abraham, C.E., V.C. Radeloff, R.B. Hammer, **T.J. Hawbaker**, S.I. Stewart, and M.K. Clayton. 2007. Effects of building density, landownership, and land cover on landscape fragmentation in northern Wisconsin, USA. *Landscape Ecology* 22:217-230.
29. Pidgeon, A.M., V.C. Radeloff, C.H. Flather, M.K. Clayton, C.A. Lepczyk, **T.J. Hawbaker**, and R.B. Hammer. 2007. The effects of housing density and landscape patterns on bird species richness across the United States. *Ecological Applications* 17:1989-2010.
30. Stewart, S.I., V.C. Radeloff, R.B. Hammer, and **T.J. Hawbaker**. 2007. Defining the Wildland Urban Interface. *Journal of Forestry* 105:201-207.
31. Syphard, A.D., V.C. Radeloff, J.E. Keeley, **T.J. Hawbaker**, M.K. Clayton, S.I. Stewart, and R. B. Hammer. 2007. Human influence on California fire regimes. *Ecological Applications* 17:1388-1402.

#### 2006 publications

32. **Hawbaker, T.J.**, V.C. Radeloff, C.E. Gonzalez-Abraham, R.B. Hammer, and M.K. Clayton. 2006. Changes in the road network, relationships with housing development, and the effects on landscape pattern in northern Wisconsin: 1937 to 1999. *Ecological Applications* 16: 1222-1237
33. St-Louis, V., A.M. Pidgeon, V.C. Radeloff, **T.J. Hawbaker**, M.K. Clayton. 2006. High-resolution image textures as predictors of bird species richness. *Remote Sensing of Environment* 105:299-312.

#### 2005 and prior publications

34. **Hawbaker, T.J.**, V.C. Radeloff, R.B. Hammer, and M.K. Clayton. 2005. Road density and landscape pattern in relation to housing density, land ownership, land cover, and soils. *Landscape Ecology* 20:609-625.
35. **Hawbaker, T.J.** and V.C. Radeloff. 2004. Road and landscape pattern in northern Wisconsin based on a comparison of four road data sources. *Conservation Biology* 18:1233-1244.

#### Conference presentations

1. **Hawbaker, T.J.**, Z. Zhu, R.B. Keane, and E. Reinhardt. 2012. Regional patterns of wildfire emissions in the conterminous United States. *5<sup>th</sup> International Fire Ecology and Management Congress*, Dec. 3-7, Portland OR
2. Stitt, S., **T.J. Hawbaker**, Y.G. Beal, J. Riegle, C. Mladnich, M. Feller. 2012. The development of an automated burned area prediction algorithm based on Landsat imagery. *5<sup>th</sup> International Fire Ecology and Management Congress*, Dec. 3-7, Portland OR

3. **T. Hawbaker**. 2012. Simulating climate-driven changes in wildfire occurrence in the western United States. Climate Change in America's National Parks webinar series, July 12<sup>th</sup>
4. **T. Hawbaker**. 2012. Climate-driven changes in wildfire occurrence and emissions in the western United States. Climate and Land Use Change seminar, July 11<sup>th</sup>
5. Mu, J., A. Wein, and **T. Hawbaker**. 2012. Economic Impacts of Wild Fires on U.S. Agriculture and Forestry Sectors. Agricultural and Applied Economics Association Annual Meeting, August 12-14, Seattle, WA.
6. Caldwell, M.K., **T.J. Hawbaker**, J.S. Briggs. 2012. Using FVS to model carbon and species composition trajectory changes resulting from disturbances. The 4<sup>th</sup> Vegetation Simulator Conference. Apr. 17-19, Fort Collins, CO.
7. Zhu, Z., **T. Hawbaker**, S. Liu, B. Sleeter, T. Sohl, and S. Stackpoole. 2012. Assessment of landscape scale ecosystem services: tradeoff of carbon storage and biodiversity with reforestation. *American Association of Geographers Annual Meeting*. Feb. 22-28, New York, NY.
8. **Hawbaker, T.**, M. Finney, M. Rollins, and Z. Zhu. 2011. Simulating wildfires under climate-change scenarios. The 8<sup>th</sup> International Association of Landscape Ecology World Congress. Aug. 18-23, Beijing, China.
9. Caldwell, M., **T. Hawbaker**, P. Cigan, S. Stitt, J. Briggs. 2011. Changes in forest vegetation and carbon storage following mountain pine beetle disturbance in the Southern Rocky Mountains. *Ecological Society of America 96<sup>th</sup> Annual Meeting*. Aug. 7-12, Austin, TX.
10. Liu, S., Z. Li, J. Liu, M. Chen, R. Gleason, L. Grangaard, C. Young, G. Schmidt, J. Oeding, B. Davis, Z. Zhu, D. Dahal, O. Aziz, T. Sohl, **T. Hawbaker**, B. Sleeter. 2011. Impacts of Disturbances, Management and Climate Change on Carbon Dynamics and N<sub>2</sub>O and CH<sub>4</sub> Emissions from 1992 to 2050 in the U.S. Great Plains. *American Geophysical Union Fall Meeting*. Dec. 5-9, San Francisco, CA.
11. Zhu, Z., D. Buttman, **T. Hawbaker**, S. Liu, C. McDonald, B. Sleeter, T. Sohl, and S. Stackpoole. 2011. An Assessment of Spatial and Temporal Distributions of Ecosystem Carbon Storage and Change in the Great Plains Region. *NASA Ecosystems and Carbon Joint Science Workshop*. Oct 3-7, Alexandria, VA.
12. Zhu, Z., S. Liu, B. Sleeter, T. Sohl, **T. Hawbaker**, and S. Stackpoole. 2011. Assessing and Monitoring Spatial and Temporal Distributions of Ecosystem Carbon Storage and Changes in the United States. *American Geophysical Union Fall Meeting*. Dec. 5-9, San Francisco, CA.
13. **Hawbaker, T.**, M. Rollins, H. Shi, and Z. Zhu. 2010. Impacts of disturbances on ecological carbon sequestration and greenhouse gas emissions. *USGS Climate Change Conference*. March 9 – 11, Denver, CO.
14. **Hawbaker, T.**, M. Rollins, J. Vogelmann, H. Shi, T. Sohl, S. Liu, B. Reed, and Z. Zhu. 2010. A national disturbance modeling system to support ecological carbon sequestration assessments. *Association of American Geographers Annual Meeting*. Apr. 14-18, Washington, D.C.
15. Stackpoole, S., Z. Zhu, S. Liu, J. Liu, T. Sohl, M. Rollins, B. Sleeter, and **T. Hawbaker**. 2010. Methodology Development for Ecological Assessment of Carbon Sequestration Capacities and Greenhouse Gas Fluxes – USGS LandCarbon Project

- (poster). *USGS Climate Change Conference*. March 9 – 11, Denver, CO (Presented by Stackpoole)
16. Zhu, Z., Bergamaschi, B., **T. Hawbaker**, S. Liu, T. Sohl, S. Stackpoole, B. Reed, and A. Reddy. 2012. An assessment of spatial and temporal distributions of ecosystem carbon storage and greenhouse gas fluxes in the western United States. *American Geophysical Union Fall Meeting*. Dec. 3-7, San Francisco, CA.
  17. Vogelmann, J., H. Shi, **T. Hawbaker**. 2010. Monitoring ecosystem disturbances using Landsat and MODIS data in the southeastern United States. *US-IALE Twenty-fifth Anniversary Symposium*. Apr. 5-9, Athens, GA.
  18. Bar Massada, A., V.C. Radeloff, S.I. Stewart, **T.J. Hawbaker**, R.B. Hammer. 2009. Mapping the spatial pattern of wildfire spread and risk in the wildland-urban interface: a simulation study from northwestern Wisconsin. *24<sup>th</sup> Annual Symposium for the U.S. Regional Association of the International Association for Landscape Ecology*. Apr. 12-16, Snowbird, UT.
  19. Gu, Y., J.F. Brown, and **T.J. Hawbaker**. 2009. Relationships between climate and satellite-derived vegetation phenology (poster). *American Geophysical Union Fall Meeting*. Dec. 14-18, San Francisco, CA.
  20. Rollins, M.G., **T.J. Hawbaker**, and J. Vogelmann. 2009. Characterizing wildland fire for the USGS-biological carbon assessment. *International Fire Ecology and Management Congress*. Nov. 30 – Dec. 4, Savannah, GA.
  21. Shi H., **T.J. Hawbaker**, M.G. Rollins, J. Vogelmann and L. Yang. 2009. Predicting burn severity and patterns of biomass consumption in support of national-scale carbon assessment (poster). *American Geophysical Union Fall Meeting*. Dec. 14-18, San Francisco, CA.
  22. Freitas, S., J.P. Metzger, **T.J. Hawbaker**, A.M. Teixeira. 2008. Road density and land use dynamics in Brazilian Atlantic Forest. *23<sup>rd</sup> Annual Symposium for the U.S. Regional Association for the International Association for Landscape Ecology*. April 6-10, Madison, WI.
  23. **Hawbaker, T.J.**, A.A. Lesak, V.C. Radeloff. 2008. Hierarchical stratified sampling optimizes forest structure maps derived from LiDAR data (poster). *23<sup>rd</sup> Annual Symposium for the U.S. Regional Association for the International Association for Landscape Ecology*. April 6-10, Madison, WI.
  24. **Hawbaker, T.J.**, C. Miller, S.I. Stewart, R.B. Hammer, and V.C. Radeloff. 2007. Housing density and wilderness fire management (poster). *EastFIRE Conference*. June 5-8, Fairfax, VA.
  25. Stewart, S.I., R.B. Hammer, V.C. Radeloff, **T.J. Hawbaker**, and S. Golding. 2007. Housing growth across the United States, 1940-2030, and implications for natural resource management. *13<sup>th</sup> International Symposium on Society and Resource Management*, June 17-21, Park City, Utah.
  26. **Hawbaker, T.J.**, V.C. Radeloff, A.D. Syphard, Z. Zhu, and S.I. Stewart. 2007. Detection rates of the MODIS active fire products (poster). *4th International Wildland Fire Conference*, May 14-17, Seville, Spain.
  27. **Hawbaker, T.J.**, V.C. Radeloff, A.D. Syphard, S.I. Stewart, and R.B. Hammer. 2006. Contemporary fire regimes of the United States as measured with MODIS satellite fire data (poster). *3<sup>rd</sup> International Fire Ecology and Management Congress*, Nov 13-17<sup>th</sup>, San Diego, CA.

28. Syphard, A.D., R.S. Taylor, V.C. Radeloff, M.K. Clayton, **T.J. Hawbaker**, R.B. Hammer, and S.I. Stewart. 2006. Predicting the spatial patterns of fire ignitions in southern California coastal shrublands. *3<sup>rd</sup> International Fire Ecology and Management Congress*, Nov 13-17<sup>th</sup>, San Diego, CA.
29. **Hawbaker, T.J.**, V.C. Radeloff, A.D. Syphard, S.I. Stewart, and R.B. Hammer. 2006. Modern fire geography of the U.S. derived from MODIS satellite active fire data. *American Association of Geographers Annual Meeting*, March 7 -11, Chicago, IL.
30. Gonzalez-Abraham, C.E., V.C. Radeloff, **T.J. Hawbaker**, R.B. Hammer, and S.I. Stewart. 2005. Landscape fragmentation due to housing growth in northern Wisconsin, USA from 1938 to 1998. *Ecological Society of America 90<sup>th</sup> Annual Meeting*, August 7-12, Montréal, Canada.
31. Gritt, J., V.C. Radeloff, **T.J. Hawbaker**. 2005. Sixty years of landscape fragmentation due to road and housing development in north-central Wisconsin (poster). *Ecological Society of America 90<sup>th</sup> Annual Meeting*, August 7-12, Montréal, Canada.
32. Rooney, T., D. Rogers, **T. Hawbaker**, V. Radeloff, and D. Waller. 2005. Local versus landscape predictors of invasive plant colonization and abundance in Midwestern forests. *Ecological Society of America 90<sup>th</sup> Annual Meeting*, August 7-12, Montréal, Canada.
33. St-Louis, V. A.M. Pidgeon, V.C. Radeloff, and **T.J. Hawbaker**. 2005. Using image texture analysis to predict breeding birds' response to fine scale habitat variability in semi-arid environments. *Ecological Society of America 90<sup>th</sup> Annual Meeting*, August 7-12, Montréal, Canada.
34. Radeloff, V.C., **T.J. Hawbaker**, R.B. Hammer, and S.I. Stewart. 2005. Pattern of change of the Wildland-Urban Interface in the Eastern United States. *EastFIRE Conference*, 7-13 May 2005, Fairfax, VA.
35. **Hawbaker, T.J.** 2004. Changes in road density and landscape pattern in northern Wisconsin, 1937-1999. *Science in the Northwoods*. September 16 & 17<sup>th</sup>, Boulder Junction, WI.
36. **Hawbaker, T.J.** and V.C. Radeloff. 2004. Time lags of invasive species spread along an expanding road network. *Ecological Society of America 89<sup>th</sup> Annual Meeting*. August 1 – 6, Portland, OR.
37. **Hawbaker, T.J.**, C.E. Gonzalez, V.C. Radeloff, R.B. Hammer, and S.I. Stewart. 2003. Cumulative effects of roads and houses on forest fragmentation in northern Wisconsin (poster). *Society for Conservation Biology 17th Annual Meeting*. June 29 - July 2, Duluth, MN.
38. Gonzalez-Abraham, C.E., **T.J. Hawbaker**, V.C. Radeloff, R.B. Hammer, and S.I. Stewart. 2003. Changes in forest fragmentation by housing in northern Wisconsin 1938-1998. *Society for Conservation Biology 17th Annual Meeting*, June 29- July 2, Duluth, MN.
39. **Hawbaker, T.J.** and V.C. Radeloff. 2003. Incomplete road data and the implications for landscape level analyses. *American Association of Geographers Annual Meeting*, March 5 - 8, New Orleans, LA.

40. Culbert, P.D., **T.J. Hawbaker**, V.C. Radeloff, and R.B. Hammer. 2003. Monitoring housing development in forested areas with remotely sensed data (poster). *North American Forest Ecology Workshop*, June 16-20, Corvallis, OR.
41. **Hawbaker, T.J.** and V.C. Radeloff. 2003. Changes in road density and landscape pattern in northern Wisconsin, 1938-19998. *North American Forest Ecology Workshop*, June 16-20, Corvallis, OR.
42. **Hawbaker, T.J.**, V.C. Radeloff, and R.B. Hammer. 2002. Patterns of road density in northern Wisconsin: driving and limiting factors. *17th Annual Symposium, International Association of Landscape Ecology, U.S. Regional Association*, April 23 - 27, Lincoln NE.