

VITAE

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See www.shovic.com for examples of projects.

PROFESSIONAL INTERESTS

Watershed evaluation and rehabilitation projects, disaster response, burned area emergency response and erosion control, digital resource geography: applications of GIS in natural resource management; remote sensing applications for resource mapping, soil survey, and ecological surveys

WORK HISTORY

2008 – present: member of the Rocky Mountain Cooperative Ecosystem Study Unit through the Department of Ecology at Montana State University – current studies with the Army Corps of Engineers, Northern Region U. S. Forest Service, and the National Park Service.

2008 – watershed scientist for the Army Corps of Engineers, Afghanistan watershed restoration project - 6 months
1979 - 2008 Soil scientist for the Gallatin National Forest: develop project plans, review and evaluate erosion potential, apply scientific findings to mountainous land erosion systems, educate specialists and resource personnel in mountain soils and erosion control (100 projects to date).
2006 – Three week detail to AID (Agency for International Development) to support disasters in Sudan, Indonesia and world-wide avian influenza spread; used GIS and existing data to provide spatial estimates of hazards
2005 - 2006 – two project trips to Afghanistan (under Foreign Agricultural Service) (two months total) to support rehabilitation of pistachio crops, used remote sensing, GPS, and field data to inventory remaining existing populations of pistachio and worked with Afghan agricultural specialists and the UN to develop plans for rehabilitation.
2002- 2008 - BAER (Burned Area Emergency Response) team leader - led 19 teams since 2002 (multi-regional), set up team, managed team, set objectives, developed specifications and obtained \$9.5MM of erosion control for mountainous lands at risk for post-fire damage to values at risk. Burned area mapping done for 17 incidents. Instructor for three regional team leader training sessions.
2000 – 2008 – self protection instructor (350 total seminars for 8,000 people)
2000- 2008: provided reclamation input for a twenty-six-million dollar project involving mine-site rehabilitation at high elevations.
2000-2008 - Resource geographer for the Greater Yellowstone Coordinating Committee (supervisors of eight National Forests and National Parks: completed 19 projects involving the Greater Yellowstone Area: resulting in two publications and 40 maps.
2000 - developed emergency GIS data recovery and archiving databases for two nationally significant wildfire suppression efforts: Cerro Grande fire at Los Alamos and northwest Montana Wildfires – Northern Wildfire Coordinating Group
1999 - directed emergency project for the Gallatin National Forest- financial health- real property and deferred maintenance.
1998- 2003: founded and operated the Interagency Spatial Analysis Center, sponsored by the Gallatin National Forest, providing inter-agency GIS services to federal and other entities. Supervised 4 employees. Projects included New World Mine Reclamation decision support and reclamation support, numerous projects for the Greater Yellowstone Coordinating Committee, the Greater Yellowstone Area Landscape Modeling project, updates to the Greater Yellowstone Area Watershed Stability project.
1997 - Sept- International Symposium on Advanced Technology in Natural Resource Management in Beijing, PRC: presented paper Transferring Technology and Science to Developing Countries: Critical Issues in the Application of Geographic Information Systems in Resource Management.
1996- 1997: Montana State University sponsored project in developing and implementing GIS analysis for high school through grade school, using the INTERNET and simplified landscape assessment GIS tools.

1996- completed soil survey and landform inventory of Yellowstone National Park; spatial analysis consultant, Yellowstone National Park (20% time); soil scientist and GIS specialist, Gallatin National Forest (50% time); special projects (listed above) at 30% time.

1993-1996 Chief, Branch of Advanced Resource Technology, Yellowstone National Park (50% time) and soil scientist, Gallatin National Forest (50% time) Duties included management of the Spatial Analysis Center (4 employees) at Yellowstone National Park, and completion of landform and soil survey (8 year projects).

1987-1993 Soil Scientist, Yellowstone National Park, Grand Teton National Park, and Gallatin National Forest.

Duties included soil and landscape project work, management of the soil survey and post-fire mapping projects for ten federal land management agencies in the Greater Yellowstone Area, Yellowstone National Park, and Grand Teton National Park, hydrology, geology programs, and fire interpretations and mapping. Supervised 45 employees. 1996- present: National Park Service sponsored project in technology transfer of GIS-based soil survey methods to Denali National Park and Death Valley National Park.

1996-: consulting spatial analyst for Yellowstone National Park.

1996-1997: United Nations sponsored six week detail to Peoples' Republic of China in Forest Pest Management: Made two trips: trained 5 professional foresters in Geographic Information Systems; installed and maintained hardware and software for their PC based system; implemented prototype GIS project including Information Needs Assessment, data gathering, quality control, digitizing, spatial analysis (including model building, decision support system, integrated information base, and digital atlas) and production of final management map products. System included HP VECTRA Pentium, HP 750C plotter, HP scanner, Calcomp digitizer, HP color laserprinter, Toshiba PC with MIPS (Map and Information Processing Software).

1985- directed Forest level project: Acid Lakes Study for high mountain lakes on the Gallatin National Forest

1979-1987 Forest Soil Scientist, Gallatin National Forest, Bozeman; duties included completion of a soil survey and a broad

1974-1976 Industrial engineer- U. S. Forest Service - logging systems

1973-1974 Industrial engineer- Lockheed Missiles and Space Company range of forest management projects.

EDUCATION

1979 Doctorate in Soils Genesis, Classification, and Inventory, Washington State University Dissertation: Genesis, Classification, and Variability of the Kitsap Soils, Washington. Research also emphasized LANDSAT imagery interpretation and statistical photogrammetry.

1973 Master's in Industrial and Management Engineering, Montana State Univ.

1972 Bachelor's in Industrial and Management Engineering, Montana State Univ.

PUBLICATIONS

Shovic, H, J. Hazelton, and S. Roylance. May 2008. Patkika, Afghanistan Water Resource Study. U. S. Army Corps of Engineers. Wilmington District, Box 1890 Wilmington, NC.

Shovic, H. F. 2005. When There's Only You: Self Protection for Women. XLibris, International Plaza II, Suite 340 Philadelphia, PA 19113-1513

Shovic, H. F., 2005. Continuing Pistachio Woodland Rehabilitation in Afghanistan Pistachio Woodlands TDY – 2: Report November 30, 2005, Prepared for USAID/Afghanistan, Office of Agriculture & Rural Development

Grauke, L. and H. F. Shovic, 2005. Initiating Pistachio Woodland Rehabilitation in Afghanistan Pistachio Woodlands TDY – 1: Report June 22, 2005 Prepared for USAID/Afghanistan, Office of Agriculture & Rural Development

Shovic, H. F. 2004. Legacy data interpretation and database migration: Northern Region Land Type Association Legend and Spatial Data, Gallatin National Forest

Shovic, H. F. 2004. Herbicide Aquifer Vulnerability Model for the Gallatin National Forest. Gallatin National Forest.

Shovic, H. F. 2003. Watershed Vulnerability for the Greater Yellowstone Area. Gallatin National Forest.

Shovic, H. F. 2001. New world mining district response and restoration project: road characterization for project planning and reclamation. Gallatin National Forest, Box 130, Bozeman, MT.

Shovic, H. F and W. Urie. 2001. Greater Yellowstone area landscapes and soils: final report on the greater Yellowstone landscape model (landtype level). Gallatin National Forest, Box 130, Bozeman, MT.

Rounds, M., H. F. Shovic, and J. C. Shovic. 2000. Predicting human/grizzly bear interaction. *ArcUser*, July-Sept. 2000. Environmental Systems Research Institute, Redlands, CA, USA.

Shovic, J. C, M. Rounds, and H. F. Shovic. 1999. Real-time sensor data input in GIS based systems. Proceedings, ESRI International User Conference 1999. Environmental Systems Research Institute, Redlands, CA.

Shovic, J. C, M. Rounds, and H. F. Shovic. 1999. Predicting human/grizzly interaction in Yellowstone National Park. Proceedings, ESRI International User Conference 1999. Environmental Systems Research Institute, Redlands, CA.

H. Shovic, J. Nesser, and C. Maynard. 1999. The Greater Yellowstone Area landscape modeling project: 1999 Interim Report.. U. S. Forest Service, Gallatin National Forest, Bozeman, MT.

Wilson, M.A., A.W. Rodman, G.N. White, D.P. Thoma, and H.F. Shovic. 1997b. Acid sulfate hydrothermal soil development from rhyolite flow and tuff: Yellowstone National Park, Wyoming, U.S.A. p. 219231. In Proc. 10th Int. Working Meeting on Soil Micromorphology, Moscow. 813 JJuly 1996. Printing Cervie Centre Van Gils B.V., Wageningen, the Netherlands. Shovic,

H. F. 1997. Transferring technology and science to developing countries: critical issues in the application of geographic information systems in resource management. Proceedings of the International Conference for Transferring Resource Technology to Developing Nations: Beijing, 1997.

Shovic, H. F. 1996. Landforms and associated surficial materials of Yellowstone National Park. Yellowstone Center for Resources, Yellowstone National Park, WY.

Rodman, A. and H. F. Shovic. 1996. Soils of Yellowstone National Park. Yellowstone Center for Resources, Yellowstone National Park, WY.

Shovic, H. F. 1996. Landscapes of northwestern Yellowstone National Park: soils, landforms, and vegetation characteristics with interpretations for erosion potential and productivity *in* Plants and their environments: proceedings of the first biennial scientific conference on the Greater Yellowstone Ecosystem. Tech. Rept. NPS/NRYELL/NRTR USDI, NPS, Nat. Res. Pub. Office, Denver, CO.

Shovic, H. F., J. Morhman, and R. Ewing. 1996. Major erosive lands in the upper Yellowstone River drainage basin from Livingston, Montana to Yellowstone Lake outlet, Yellowstone National Park *in* Plants and their environments: proceedings of the first biennial scientific conference on the Greater Yellowstone Ecosystem. Tech. Rept. NPS/NRYELL/NRTR USDI, NPS, Nat. Res. Pub. Office, Denver, CO.

Shovic, H. F., A. Rodman, and E. Compas. 1996. The virtual landscape of Yellowstone National Park: Integrating Spatial Analysis with the process of scientific discovery to create a soils resource inventory. in Proceedings of the Western Regional Cooperative Soil Survey Conference, June 2-7 1996. USDA, NRCS, Bozeman, MT.

Shovic, H. F., A. Rodman, and E. Compas. 1996. The virtual landscape of Yellowstone National Park: Integrating Spatial Analysis with the process of scientific discovery to create a soils resource inventory. in Proceedings of the 16th Annual Environmental Systems Research Institute (ESRI) User Conference, ESRI, Redlands, CA.

Wilson, M. A., A. Rodman, H. Shovic, D. Thoma, and G. White. 1996. Hydrothermal soils of Yellowstone National Park. in Proceedings of the Western Regional Cooperative Soil Survey Conference, June 2-7 1996. USDA, NRCS, Bozeman, MT.

Davis, C. and H. Shovic. Soil Survey of the Gallatin National Forest, Montana. 1996. USDA, SCS, USGPO (project finished in 1984)

Shovic, H. F., M. Johnson, and H. H. Porter. 1994. A new view of an old land: use of GIS and landscape modeling in Yellowstone. *Yellowstone Science*. Vol. 1. No. 2. National Park Service, Yellowstone National Park, WY.

Rodman, A., H. Shovic, and D. Thoma. 1992. Draft soil survey of the John D. Rockefeller Parkway, Grand Teton National Park. Yellowstone Center for Resources, Yellowstone National Park, WY.

Shovic, H., A. Rodman, and D. Neprud. 1991. Soils investigation of the Reese Creek-McMinn Bench-Stevens Creek Area, Yellowstone National Park. Yellowstone Center for Resources, Yellowstone National Park, WY.

Shovic, H. 1990. The Greater Yellowstone Fires of 1988: erosion, revegetation, and sedimentation two years later. in Proceedings, National Forest Soil Productivity Symposium, 1990.

Rodman, A., H. Shovic, D. Despain, and P. Schullery. 1990. Burned Area Survey of Grand Teton National Park: the fires of 1988. Divison of Research, Box 168, Yellowstone National Park, WY.

Rodman, A. and H. Shovic. 1990. Use of remote sensing in the Greater Yellowstone fires. Proceedings, U. S. Forest Service Biennial National Conference on Remote Sensing, Tuscon

quoted in five books, 6 magazines, and on numerous television programs (including NOVA series on Yellowstone fires of 1988) about fire effects, soils revegetation, stream recovery, erosion

Despain, D., A. Rodman, P. Schullery, and H. Shovic. 1989. Burned area survey of Yellowstone National Park: the fires of 1988. Division of Research, Box 168, Yellowstone National Park, WY.

Shovic, H. 1989. The Greater Yellowstone burned area survey, and fire effects on soils. in Mills, S. (ed.). Greater Yellowstone post-fire assessment. Greater Yellowstone Coordinating Committee.

Shovic, H. Team Leader, Burned Area Survey Team, Greater Yellowstone Post Fire Resource Committee. 1988. Preliminary burned area survey of Yellowstone National Park and surrounding National Forests. Dept. of Research, Box 168, Yellowstone Natl. Park, WY.

Shovic, H. F., J. Morhman, and R. Ewing. 1988. Major erosive lands in the upper Yellowstone River drainage basin from Livingston, Montana to Yellowstone Lake outlet, Yellowstone National Park. Dept. of Research, Box 168, Yellowstone National Park, WY.

Shovic, H. F. 1988. US Forest Service non-point pollution control: strategies and tactics. Proceedings of Conference XIX, International Erosion Control Association.

Shovic, H. F., J. Sasich, and M. Turner. 1986. A guide for revegetation of road cuts, fills, and small eroded areas for the Gallatin N. Forest. USDA, Forest Service, Gallatin National Forest, Bozeman, MT.

Shovic, H. F., and R. Kracht. 1985. Relationships of soil disturbance to reforestation problems on a droughty site in SW Montana. USDA, Forest Service, Gallatin National Forest, Bozeman, Montana

Shovic, H. F., and C. Montagne. 1985. Application of a statistical soil-landscape model to an order III wildland soil survey. Soil Sci. Soc. Am. J. 49:961-968.

Davis, C. E., and H. F. Shovic. 1984. Soil survey of the Gallatin National Forest, southwestern Montana, Interim Report. Forest Service, Gallatin Forest, Box 130, Bozeman, MT

Shovic, H. F., B. E. Frazier, and R. A. Gilkeson. 1982. Properties and classification of Kitsap soils in northwestern Washington. Soil Sci. Soc. of Am. J. 46:1253-1258.

Shovic, H. F., C. F. Engle, and B. E. Frazier. 1980. A rapid and moderate cost method of measuring landscape composition using random samples from aerial photos. Extension bulletin 0734. Washington State University, Pullman.

Frazier, B. E., and H. F. Shovic. 1980. Statistical methods for determining land-use change with aerial photographs. Photogrammetric Eng. 46:1067-1077.

Frazier, B. E., and H. F. Shovic. 1979. Sampling land use changes on prime agricultural land in western Whatcom County, Washington. Jnl. of Soil and Water Cons. 34:25-27.

Williams, A. S., G. A. Nielson, H. F. Shovic, D. G. Stuart, and I. W. Reuss. 1978. Guidelines for conducting interdisciplinary research in a university setting. Rev. of Public Data Use. March, 6:2.

DIGITAL RESOURCE GEOGRAPHY, SPATIAL ANALYSIS, AND COMPUTER SYSTEMS EXPERIENCE

- * Present projects include GIS and reclamation support to a multimillion dollar reclamation project in the New World Area and a multi-year landscape modeling project for the Greater Yellowstone Area (31 million acres.), and a Greater Yellowstone Area-wide project on developing watershed vulnerability models.
- * Completed three graphics design projects for professional conferences describing land consolidation, pistachio rehabilitation, and recreation analysis.
- * Completed four GIS multi-year projects in resource inventory using rule based systems, have completed 35 digital resource geography projects in wildlife, erosion prediction and control, forestry, soils, archeology, landscape architecture, visitor use management, landscape assessment, and terrain analysis.
- * Developed two web sites using HTML, DREAMWEAVER.
- * Gathered and integrated inter-agency spatial data from different machines and formats, UNIX, PC, a variety of tape media, and formats including MOSS, GRASS, ARC, and text (DEM).
- * Professionally competent in ARC/INFO (16 years), GRASS(2 years), ARCVIEW (3.2, UNIX and PC)(7 years), 3DMAPPER, and ARCGIS (3 years.) use geodatabases, task assistant, spatial analyst, 3D visualization.
- * Professionally competent in DataBase Management: PARADOX, DBASE, ORACLE, ACCESS, INFO. Professionally competent in PC operation and maintenance (hardware and software), 386, 486, Pentium, Windows, DOS, Windows 95, VISUAL BASIC, spreadsheets, FORTRAN, presentation graphics.
- * Familiar with UNIX, DOS, OS/2, Windows, networking, AUTOCAD
- * Used other GIS's including MIPS, LANDVIEW, ERMAPPER, LTPLUS, ERDAS IMAGINE
- * Have specified, purchased, installed and maintained SUN and PC workstations. Have experience with IBM, DEC, have

installed SCSI devices

* Have used HP750C, HP Designjet (pen), ALTEC and Calcomp digitizers, flat bed and drum scanners.

* Have INTERNET connection at home and work. Installed and maintained both, using MOSAIC, NETSCAPE, FTP, TELNET, and EUDORA, Virtual Private Network, Firewalls. Have implemented home networks.

* Have designed, installed, and programmed an extensive home automation system, including network-based microcomputer controls and input/output interfaced with an electronic weather station and interactive Visual Basic based user interfaces: includes heat/light controls with motion sensors, door lock and status sensors, screen based control of 100CD player, 5 zone audio, and programmed X-10 and infrared.

SCIENTIFIC PRESENTATIONS, TEACHING EXPERIENCE

2002-present Have given 300 lectures/seminars in self protection to collegians, business (banks), government (state and federal), and many non-profit organizations for 5,000 people.

Presentations at 2003, 2004, 2005, 2006, 2007, 2008 Regional Training Academy, U. S. Forest Service: Burned area emergency response, digital toolkits for GIS, and self protection for frontliners

Presentation on emergency GIS database recovery at Los Alamos for the National Association of Federal Planning Conference, New Orleans, LA (2001)

Lectures on the greater Yellowstone landscape model for four conferences, 2000- 2001, Jackson Wyoming, Kona Hawaii, Red Lodge Montana, Salt Lake City Utah (2001)

Invited Speaker at Denali National Park, Alaska; Death Valley National Park, California; and Great Smoky Mountains National Park, Tennessee, subject: GIS and rule based Soil Survey methods for large wildland parks (1996);.

Lecturer for International Studies Program for Japanese Exchange students (1996)

Invited Speaker at the 16th Annual Environmental Systems Research Institute User Conference, Palm Springs. (1996)

Yellowstone Institute (taught 16 hour class on fire/soils interactions (1989, 1990, 1991)

Teton Science School (taught four hour class on fire/soil interactions) (1990)

Invited speaker on GYA fires: Recovery. National Soil Survey Lab, Soil Conservation Service, Lincoln (Aug. 1990)

Invited speaker on GYA fires: Recovery. National Park Service, Rocky Mountain Region, Denver (1990)

Invited speaker on GYA fires: Recovery. Internatl. Erosion Control Assoc., Annual Meetings, Washington, DC (1990)

Invited speaker on GYA fires: Recovery. Washington Office, Forest Service; Washington Office, Park Service (1990)

Invited speaker on GIS applications in burned area survey. Forest Service Geometronics Center, Salt Lake (1990)

Invited speaker on Fires of 1988. Soil and Water Conservation Association, Cody, Wy (1989)

Six presentations on Yellowstone Fires to various civic and professional groups (1989)

Speaker, GYA Post-Fire Effects Symposium, Univ. of Wyoming (1989)

Speaker, Greater Yellowstone Coalition Annual Meetings (1989)

Invited speaker, National Fire Rehabilitation Workshop, Sacramento (1989)

Developed and led four training sessions on soils for Ranger Districts for Yellowstone National Park (1989-1990)

Speaker, Whitebark Pine Symposium, Montana State University (1988)

Speaker, GYA Post Fire Research Meeting, Yellowstone National Park (1988)

Developed and gave three training sessions on backcountry safety for the Gallatin National Forest (1986)

Developed and taught a one credit course in ?use of small computers for scientific applications@ at Montana State University, Plant and Soil Science Dept. (1985)

Developed and gave three yearly training sessions in soils for Forest Personnel (five Districts) (1983, 1984, 1986)

Presented papers at National Soil Science Society Meetings (1978, 1985, 1988, 1992)

Poster Session at Symposium in ?Computers and Resource Management@ sponsored by University of Montana and the Forest Service, (1983)

Invited Speaker at the Reforestation and Soils SAF Chapter Meeting, Bozeman, MT (1984)

Gave two invited workshops on statistical systems in soil survey for Forestry Sciences Lab in Moscow, and for the Bitterroot National Forest (1984)

Lectured an upper level course in air photo interpretation (1979)

Developed and gave a one day course on land use determination using statistical techniques and air photos for county planners. (1979)

Developed and presented a 1/2 day workshop on soil compaction for thirty Forest personnel on the Clearwater N. F. (1979)

Musical and stage experience- 4 years as professional musician
Three department seminars on own research at Washington State University (1978)

PROFESSIONAL ASSOCIATIONS AND COMMITTEES

Chairperson – Gallatin Forest Space Committee – investigated 120 person move to new building- 2004
Certified Professional Soil Scientist (1982-2006) by American Association of Agronomy
Conference Chair: Greater Yellowstone Resource Geography 2002
Soil Science Society of America (1978-present)
East Side Fire Rehabilitation Committee- Forest Contact (1988- 1994)
Co-chair, Greater Yellowstone Soil Scientists Meeting (1990)
Federal Women's Program- Tape and Video Library Coordinator (1988- 1991)
Chairperson, Ad Hoc Greater Yellowstone Soil Scientists Committee (1986)
Reviewer for the Soil Science Society Proceedings Journal (1986)
Committee member for development of quantitative landslide interpretations sponsored by the Forestry Science Lab, Missoula MT. (1986)
Chairperson, Gallatin Forest Safety Committee (1986, 1987)
Chairperson, Gallatin Forest Seasonal Committee (1986)
Chairperson, Gallatin Forest All Hands Meetings Design Committee (1986)

AWARDS, HONORS, AND PUBLIC SERVICE

Lions Club 2004
Red Belt Tae Kwon Do 2004
Blue Belt Judo 2005
Self Protection Courses for Adult Education, local schools, girl scouts; 12 seminars – 2002-2004
Certificate of Merit- diligence and teamwork for a fuels reduction project – 2004
Certificate of Recognition- 25 years of Federal Service- 2004
Black Belt Aikido 2002
Certificate of Merit- innovation for the Greater Yellowstone Watershed Vulnerability Project 2002
Certificate of Award from U. S. Forest Service Region One – for an outstanding effort in helping to develop the Greater Yellowstone are landscape model.
Certificate of Merit- in recognition of excellence in directing the INFRA emergency project June – Oct 1999.
Certificate of Merit- in recognition of excellence in collaborative professional/technical analysis of the feasibility of the mining proposal for Crown Butte (1996) (included \$300 cash award)
Recognition for Excellence- Employee of the Week, Gallatin Forest (June 1990)
Certificate of Merit- for leadership of the 1988 Burned Area Survey Team (1989)
Certificate of Appreciation- Gallatin National Forest- 1987 for team effort
Certificate of Appreciation- Gallatin National Forest- 1985 for leadership in acid rain project
Work Suggestion Award for Computer System in Soil Survey- (1984)
Production Improvement Award Lockheed Missiles and Space Co. (1974)
Sigma Xi (research honorary) 1979
Alpha Zeta (agricultural honorary) 1978
Tau Beta Pi (engineering honorary) 1970
Phi Eta Sigma (engineering honorary) 1969
Advanced Honor Scholarship 1969
Dean's Scholarship 1969,1970
3M Company Scholarship 1969
Western Electric Company Scholarship 1969

TRAINING

Geodatabases (2005), Communications and Leadership training (2006), Leadership in Wildfire (2004), ARCOBJECTS GIS training 2003, Burned area emergency response leadership (2003), Database Modeling (2001), Marketing and Sales in

Government Organizations (2000), Winning through Negotiation (1998). Chester Karass, Inc. Seattle, WA. Annual ESRI GIS conferences for ARC/INFO (1995, 1996) FRAGSTATS (GIS based habitat fragmentation training) Ft. Collins, CO USDA (2 days) June 1996. PC-ARC INFO GIS course (3 days) (May 1994) Completed eight career cassette tape programs (problem solving, achieving goals, politics and power, time management, effective delegation, possibility thinking, psychology of achievement, success self programming) (1988-1990) National Fire Rehabilitation Workshop, Sacramento, CA (1988) Crew Boss Training, Mammoth, WY (1988) Intermediate Fire Behavior, Jackson, WY (1988) Forest Service GIS Workshop, Salt Lake City (1987) Stream Channel Morphology Course (by L. Leopold), Teton Sci. School (1987) Advanced Meetings Management, Bozeman, MT (1987) Achieving Excellence- CareerTracks, Billings, MT (1987) Effective Interaction- Denver, CO, (1986) Incident Command System training, Bozeman, MT (1986) Wilderness Medicine Symposium, Jackson, WY (1986) High Elevation Revegetation Workshop, Fort Collins, CO (1986) Civil Rights Awareness Workshop, Bozeman, MT (1986) Basic Firefighter Training (1985) Management by Objectives and Results, Helena, MT (1985) Meetings Management, Bozeman, MT (1985) Good Host Training, Bozeman, MT (1985) Reforestation Workshop, Missoula, MT (1984) Slope Stability Symposium, Seattle, WA (1984) Speed Reading Self Study Course (1984) Computers in Resource Management, Missoula, MT (1983) Problem Solving and Decision Analysis, Livingston, MT (1983) Cultural Awareness, Bozeman, MT (1983) Understory Prescribed Burning Workshop, Bozeman, MT (1982) Communication and Counseling Workshop, Fairmont Hot Springs, MT (1982) Forest Habitat Types, Missoula, MT (1981) Professional Orientation Conference (USFS), (1981) Logging Systems and Sale Design Orientation, Missoula, MT (1981) Soil Compaction and Productivity Workshop, Corvallis, OR (1979) International School of Industrial Design, Florence Italy (summer, 1971)

WILDFIRE FIGHTING QUALIFICATIONS AND EXPERIENCE

Burned Area Emergency Response Team Leader – 17 incidents since 2002; 22 wildfires since 1984, three prescribed fires; Crew boss qualified (20 person crew); fire rehabilitation specialist on Greater Yellowstone fires of 1988 for 6 months; GIS specialist/coordinator on Cerro Grande fire 2000, NW Montana Fires 2002, Burned area mapping using satellite photography 2003.