

Chair Forest Resources

2.2.14 Laboratory : Silviculture

Member:	Professor	Shibata, Shozo Ph.D.
	Associate Professor	Ando, Makoto Ph.D.
	Associate Professor	Tokuchi, Naoko Ph.D.
	Associate Professor	Hasegawa, Hisashi Ph.D.
	Assistant Professor	Sakimoto, Michinori Ph.D.
	Doctor's program	1
	Master's Program	6
	Undergraduate	2
	Post-Doctoral fellow	1

A. Research Activities (2009.4-2010.3)

A-1. Main Subjects

a) Studies on forest management and harvest

Present Japan's managed forests like artificial forest, Satoyama etc. are not under well-managed condition because of the decline of forestry. We notice these forests as the target to restore their management, ecosystem and biodiversity and to develop new harvest systems. To consider these theses, researches of harvest systems of woody products, monitoring of environmental characteristics of managed woodlands, discussion of restoration methods of Satoyama including ecological research of bamboo forest etc. are practiced.

b) Regeneration and dynamics of forest

The establishment of forests and the distribution of tree species are influenced by climate, soil and topography, or natural disaster, artificial disturbance, animal, insect, disease, and the like. Main theme of this study is to clarify the relationship between various environmental factors and dynamics of forest by long-term research of stand structure, diversity, growth and regeneration for natural forest, secondary forest, man-made forest and urban forest of warm-temperate zone, cool-temperate zone and subarctic zone in Japan.

c) Nitrogen cycling

Nitrogen is the limiting factor for plant growth. N dynamics is important for forest, especially in plant-soil system. Nitrogen dynamics is described the typical Japanese vegetation which belongs to Field Science and Education Center, Kyoto University.

d) Studies on dynamics, maintenance mechanisms of biological diversity, and life historical strategies of plant species in forests

Natural forests are heterogeneous in time and space, and are composed of various many plant species. Those plant species have their own specific life history strategies. To develop the methods for ecological management and conservation of forests, we are engaged in analyzing spatial structure, dynamics mechanisms of diversity, and reproductive ecology and demography of plant species in natural forests.

A-2.Publications and presentations

a) Publications

Books

- Hasegawa, H.: Review on Forest Engineering Research - Operations. (in "25 years track of Japan Forest Engineering Society", Tokyo), 37-40, 2011

- Tokuchi N, Hirobe M., Kondo K., Arai H., Hobara ,S., Fukushima K, Matsuura Y. (2010) Soil nitrogen dynamics in larch ecosystem. *Permafrost Ecosystems: Siberian Larch Forests*. Osawa,A., Zyryanova,OA., Matsuura,Y., Kajimoto,T., Wein,RW. (eds.) *Ecological studies* 209:229-243

Original Papers(including book-reviews)

- Wu C. and Ando M. : Relationship between the distribution of *Pinus densiflora* Sieb. et Zucc. seedlings, saplings, and juveniles and site conditions in a pine wilt disease forest. *J. Jpn. Soc. Reveget. Tech.* 36(2), 304-310, 2010

- Tobari Y, Koba K, Fukushima K, Tokuchi N, Ohte N, Tateno R, Toyoda S, Yoshioka T, Yoshida T (2010) Contribution of atmospheric nitrate to stream-water nitrate in Japanese coniferous forests revealed by the oxygen isotope ratio of nitrate. *Rapid Commun. Mass Spectrom.* 24: 1281–1286 (査読有)

- Ohte, N. and Tokuchi, N. (2010) Seasonal Variations in Discharges of Nitrate; Biological or hydrological? *Geographical Compass* 4: 1358–1376 (査読有)

- Arai H, Tokuchi N. (2010) Factors contributing to greater soil organic carbon accumulation after afforestation in Japanese coniferous plantation as determined by stable and radioactive isotopes. *Geoderma* 157: 243-251 (査読有)

- Ueda MU, Mizumachi E, Tokuchi N (2010) Winter nitrate uptake by the temperate deciduous tree *Quercus serrata*. *Journal of Forest Research* 15:411–414 (査読有)

- Arai H, Tokuchi N. (2010) Soil organic carbon accumulation following afforestation in a Japanese coniferous plantaion based on particle-size fractionation and stable isotope analysis. *Geoderma* 159: 425-430 (査読有)

- Tokuchi N, Usui N, Ueda M, Fukushima K (2010) Vegetation change nad nutrient cycling in Satoyama. *Case study of Tennouzan Water Science* 54(312) (査読有)

- Ohte N, Tokuchi N, Fujimoto M. (2010) Controlling factor of seasonality of NO₃- loss. Water Science 54 (.312)(査読有)

- Matsuyama,S. & Sakimoto,M. : Sexual dimorphism of reproductive allocation at shoot and tree levels in *Zanthoxylum ailanthoides*, a pioneer dioecious tree. Botany 88: 867 - 874, 2010. 査読有り

- Fukamachi, K., M. Ohgishi, K. Oku, I. Miyoshi, M. Horiuchi and S. Shibata: Changes in the rice terrace landscape and factors playing a role in the survival of the rice terraces in a mountainous area of the Tango Peninsula. Journal of Rural Planning: 28; 315-320, 2010 (in Japanese)

Reports,others

- Hasegawa, H.: Research plan and results in 2009 on the Niyodogawa Project. Wood Culture Project Annual Report 2009, 197-200, 2010 (in Japanese)

- Hasegawa, H., Sugimoto, K., Fukui, R., Shirasawa, H., Takeda, A., Ichikawa, T., Ikeyama, Y., and Ohara, E: Development of thinning operation model on high-density road network. Wood Culture Project Annual Report 2009, 201-205, 2010 (in Japanese)

- Hasegawa, H., Ichikawa, T., and Sugimoto, K.: Harvesting System Selection based on cost of road construction. An. Mtg. Jpn. For. Soc. 121, 2010 (in Japanese)

- Iwai, Y., Otsuka, K., Hasegawa, H., and Maeda, T.: Characteristics of Container Seedlings. An. Mtg. Jpn. For. Soc. 121, 2010 (in Japanese)

- Sugimoto, K., Ito, Y., and Hasegawa, H.: Employee Satisfaction Research on Forest Sectors. An. Mtg. Jpn. For. Soc. 121, 2010 (in Japanese)

- Fukui, R., Sugimoto, K., Hasegawa, H., Maeda, T., and Syudo, Y.: Characteristics of fiber rope in tree logging. An. Mtg. Jpn. For. Soc. 121, 2010 (in Japanese)

- Shirasawa, H. and Hasegawa, H.: Evaluation of wood market placement. An. Mtg. Jpn. For. Soc. 121, 2010 (in Japanese)

- Takeda, A., Sugimoto, K., and Hasegawa, H.: Efficiency of biomass collection on ground using Harvester. An. Mtg. Jpn. For. Soc. 121, 2010 (in Japanese)

- Yoshimura, T., Nose, M., Hasegawa, H., and Gumus, S.: Evaluating the GPS accuracy for different GPS antenna heights under forest canopy. The 1st International Symposium on Turkish & Japanese Environment and Forestry, 79-88, 2010

- Shirasawa, H. and Hasegawa, H.: Solution of facility placement problem in harvesting operations. An. Mtg. Jpn. For. Soc. 122, 187, 2011 (in Japanese)

- Fukui, R., Hasegawa, H., and Iida Y.: Effect of pavement and gradient on forestry vehicles. An. Mtg. Jpn. For. Soc. 122, 697, 2011 (in Japanese)

- Ikeyama, Y., Hasegawa, H., and Sugimoto, K.: Effect of mulching shape on undergrowth. An. Mtg. Jpn. For. Soc. 122, 707, 2011 (in Japanese)

- Sugimoto, K., Ito, Y., and Hasegawa, H.: Necessary efforts for increasing employee satisfaction. An. Mtg. Jpn. For. Soc. 122, 570, 2011 (in Japanese)

- Takeda, A., Fukui, R., Shirasawa, H., and Hasegawa, H.: Harvesting system using wheel harvester and semi-crawler forwarder. An. Mtg. Jpn. For. Soc. 122, 683, 2011 (in Japanese)

- Hasegawa, H., Fukui, R., Takeda, A., and Iida, Y.: Effect of pavement on running forestry vehicles. Report of forestry mechanization 2010, 38pp, 2011 (in Japanese)

- Kyoto Forest Cooperative Union, Hasegawa, H., Sugimoto, K., and Shirasawa, H.: reports on ES research and wood logistics. Report of Forest Maintainance Promotion Project 2010, 49pp, 2011 (in Japanese)

- Hasegawa, H.: A book review "Concept and Technology of Forest management", Jpn. For. Eng. 25(2), 2010

- Suyama, Y., T. Saito, A. Nishiwaki, A. Makita and S. Shibata: Genet structure of *Melocanna baccifera* community gregariously flowered in 48-year interval. Proc. 121st annual meetings of Japan Forest Society; 116, 2010

- Shibata S., Y. Yoshida: Influence of restart of vegetation management on Satoyama ecosystem. Proc. 121st annual meetings of Japan Forest Society; 295, 2010

- Nakanishi, A., Y. Inagaki, S. Shibata and N. Osawa: Influence of small-scale cutting on nutrient distribution on *Chamaecyparis obtusa*. Proc. 121st annual meetings of Japan Forest Society; 512, 2010

- Shibata S.: Influence of the restoration of vegetation management on ecosystem and biodiversity of Satoyama, Proceedings of the 2nd International Conference of Urban Biodiversity and Design (URBIO2010): 154, 2010

- Imanishi A., S. Shibata, A. Nakanishi and N. Osawa: Change of woody-species composition in an early stage of plant succession after cutting in a suburban secondary forest dominated by *Chamaecyparis obtusa*, Proceedings of the 2nd International Conference of Urban Biodiversity and Design (URBIO2010): 155, 2010

- Nakanishi A., Y. Inagaki, N. Osawa, S. Shibata and K. Hirata: Effects of patch cutting on leaf nitrogen nutrition in natural regeneration hinoki cypress stands at different elevations along a slope in Kyoto, Japan, Proceedings of the 2nd International Conference of Urban Biodiversity and Design (URBIO2010): 156, 2010

- Osawa N., A. Nakanishi and S. Shibata: Logging impacts on forest carabid assemblages at the secondary forest in Japan, Proceedings of the 2nd International Conference of Urban Biodiversity and Design (URBIO2010): 157, 2010

- Abe Y., K. Fukamachi, H. Oku and S. Shibata: The connection between urban and rural areas through the use of dwarf bamboo leaves in Kyoto City, Proceedings of the 2nd International Conference of Urban Biodiversity and Design (URBIO2010): 168, 2010

- Sakai, S., S. Shibata and A. Terai: Influence of remained trees at strong-thinned Satoyama on seed dispersal by birds. Proceedings of the 2nd International Conference of Urban Biodiversity and Design (URBIO2010): 350, 2010

- Shibata, S.: Bamboo. UC Card Magazine: 43(4); 18-21, 2011

b) Conference and seminar papers presented

- Hasegawa H.: The 17th annual meeting of Japan Forest engineering Society (1)

- Hasegawa, H.: The 121st annual meeting of Japanese Forest Society (6)

- Hasegawa, H.: The 1st International Symposium on Turkish & Japanese Environment and Forestry (1)

- Ando, M.: The 121st Annual meeting of the Japanese Forest Society (2)

- Ando, M.: The 2nd International Conference of Urban Biodiversity and Design (1)

- Ando, M.: The 58th Annual meeting of the Ecological Society of Japan (1)

- Tokuchi, N.: The 121st annual meeting of Japanese Forest Society (2)

- Tokuchi, N.: The 58th Annual meeting of the Ecological Society of Japan (3)

- Sakimoto, M.: The 121st annual meeting of Japanese Forest Society (3)

- Sakimoto, M.: Ecological Society of Japan, Kinki Branch (1)

- Shibata, S.: 52th Annual meeting of Forest Society of Japan (3)

- Shibata, S.: 2nd International Conference of Urban Biodiversity and Design (6)

- Shibata, S.: Annual meeting of Jpn. Assoc. Rural Planning (1)

A-3.Off-campus activities 1

Membership in academic societies

- Shibata, Shozo Ph.D. : Jpn. Inst. Landscape Architecture (Councilor, Organizer of Kansai Branch, International committee member), Jpn. Soc. Revegetation Technol. (Vice-president, Chairman of academic section, Chairman of environmental forest section, Chairman of the selection of award), Japan Forest Society (Councilor), Ecological Society of Japan (Committee member of Kinki district), Japan Bamboo Society (Consultant, Editorial member of Bamboo Journal), Japan Association of Forestry Technology, Kansai Branch (Chairman of Kyoto Univ. Branch, Auditor), Association for Bamboo Research (Representative), Jpn. Bamboo Soc. (Councilor, Editorial member), Center for Support of Forest regeneration (Councilor), Japan Bamboo Foundation (Councilor), Consortium for Bamboo Resources Effective Uses (Advisor), CDM Network in Osaka (Advisor), Research Institute of Environmental Resources (Vice President)

- Ando, Makoto : Hokkaido Branch of the Japanese Forest Society (Councilor)

- Hasegawa, Hisashi : Japanese Forest Society (Council member), Japan Forest Engineering Society (Executive director, Editorial member), Japan Society of Forest Planning (Project planner), Society of Forest Production System (Executive), Society of Forest Spatial Utilization (Executive)

A-3.Off-campus activities 2

Research grants

1. Grants-in-aid for Scientific Research(KAKENHI)

- Basic Research (A) : Shibata, Shozo : Influence of bamboo gregarious flowering in Mizoram, India to the local ecosystem and local shifting cultivation agriculture

- Basic Research (B) : Kobayashi, Masami : Solution of actual condition of sluggish hazard around local unfortunate people and regional recovery mechanism in Indochina area

- Basic Research (A) : Nakamura, Futoshi : Academic research of scientific estimation , restoration methods and abstraction of important ecosystems

- Basic Research (S) : Ishikawa, Noboru : Planted Forests in Equatorial Southeast Asia:Human-nature Interactions in High Biomass Society

- Basic Research (B) : Tokuchi, Naoko : N saturation mechanism with forest aging and prediction of its influence using PnET-CN

- Basic Research (B) : Sugimoto Atsuko : Water use in Siberian larch forest

2.Other Research Grants

- Sponsored Research Funds : Ando, Makoto, D. Agric.Sci : Vegetation survey of Forest around Hacchou-daira swamp, 2010

A-4.International cooperations and overseas activities 1

Membership in academic societies

- Shibata, Shozo: International Conference of Urban Biodiversity & Design 2010 (Auditor), World Bamboo Organization (Board of General member), International Consortium of Landscape and Ecological Engineering (Secretary General)

International meetings(country,roles)

- Shibata, Shozo :

International joint research, overseas research surveys

- Vegetation survey of trees of Nothofagus and Podocarpaceae (Ando M., New Zealand)
- Survey of biomass utilization, forest road, and harvesting system in Germany (Hasegawa H, Germany)
- Survey of biomass utilization, forest road, and harvesting system in Switzerland (Hasegawa H, Switzerland)
- Planted Forests in Equatorial Southeast Asia:Human-nature Interactions in High Biomass Society (Tokuchi N, Malaysia)

A-4.International cooperations and overseas activities 2

Visiting Research Scholars

- 私費 1 (Brazil)

B.Educational Activities(2009.4-2010.3)

B-1.On-campus teaching

a) Courses given

- Undergraduate level: Shibata, Shozo: pocket seminar “Learning in “Afin’s forest” of C. W. Nikol” (Shibata), Pocket seminar “Creation of woody school buildings – Restoration of woody culture” (Shiba, Shibata, Kobayashi), Linkage of forest, human, and coastal ecosystems (relayed), Integrated Coastal Management (relayed), Basic forest science IV (Osawa, Isagi, Yoshioka, Shibata), Silviculture (Shibata, Ando, Hasegawa, Tokuchi, Sakimoto), Forestry (Shibata, Ando, Hasegawa, Tokuchi, Sakimoto), Laboratory course in applied forest and biomaterial science (Ando, Sakimoto), Practice for forest science I (Sakimoto), Practice for forest and forestry (Sakimoto), Practice for forest science II (Tokuchi)
- Graduate level: Silviculture (Shibata, Ando), Seminar in Silviculture (Shibata, Ando, Hasegawa, Tokuchi, Sakimoto), Practice Course in Silviculture (Ando, Shibata, Tokuchi, Sakimoto), Restoration of Satoyama (Shibata, Fukamachi), Silviculture II (Ando), Silviculture I (Shibata, Hasegawa)

B-2.Off-campus teaching etc.

Part-time lecturer

- Shibata, Shozo: Kyoto College of Art (Correspondence course, Landscape Design and Nature conservation)

- Hasegawa, H.: Tokyo University of Agriculture and Technology (Theory of Precision Forestry)

Open lectures, etc.

- Shibata, Shozo: ANA Blue Sky Lecture in Nagasaki (ANA, lecturer), Lecture for Ibaraki High-school (Ibaraki

ANA Blue Sky Lecture, Komatsu Airport (ANA, lecturer), Spring action of Bamboo Linkage Project of Kyoto University (Kyoto Univ., lecturer), Culture School of San-in Chuo Newspaper Bureau (San-in Chuo Newspaper Bureau, lecturer), Lecture of Environmental Committee of Kobe Economic Circle Kobe Economic Circle, guest speaker), Study Circle of Minamata Bamboo Park (Minamata Bamboo Park, lecturer), Mori-Sato-Umi Renkangaku Symposium in Tanabe (Wakayama pref., lecturer), Workshop of International Cooperation Station, Kyoto 2010 (Kyoto Pref., Speech), Autumn action of Bamboo Linkage Project of Kyoto University (Kyoto Univ., lecturer), Kyoto University Lecture in Kochi (Kyoto Univ., speech), 3rd Workshop of Chi-no-ki Association (Chi-no-ki Association, lecturer), Younger forum of 51st annual meeting of Japan Bamboo Association (Japan Bamboo Association, adviser), Panel discussion of 51st annual meeting of Japan Bamboo Association (Japan Bamboo Association, coordinator), 7th Clock Tower Meeting of FSERC (Kyoto Univ., Closing speech), Regional Lecture of FSERC in Yura River (Kyoto Univ., lecturer), City Corner's Salon of Green (City Corner's Salon, lecturer), 3rd Environmental Seminar of North ward, Kyoto City (North ward, Kyoto City, speech and paneler), Lecture series of Kyoto University Museum (Kyoto University Museum, lecturer)

- Hasegawa, H.: Spring Open Seminar of Ashiu F.R.S., Field Science Education and Research Center, Kyoto University, Lecture

- Training Course of low-cost forest operation in Hyogo Prefecture, Hyogo Prefecture, Lecture: Workshop on small-scale forest road, Yoshino Ringyo Club, Lecture

- Innovative project on forest management, Takatsugawa Forestry Cooperative, Leader: Hokubu
Campus Tour on Home-Coming-Day of Kyoto University, Explanation

- Advanced forest machinery in Akan, Commentator: Advanced forest machinery in Okayama,
Commentator

- Ando, Makoto: Open lecture in Ashiu, Field Science Education and Research Center, lecturer

- Nature observation meeting in autumn, Kamigamo experimental forest, lecturer: Learning Kyoto
University's Knowledge in Tokyo, Kyoto Univ., lecturer

B-3.Overseas teaching 1

International students

- International students : Doctral 1 (Brazil)

C.Other Remarks

- Shibata, Shozo : Committee to consideration of policy for green public works, Kyoto Pref. (chairman), CENEED (Centre for Nepal of Environmental and Educational Development) Supporting Group (president), Committee for built-up of bamboo forest management system, Agency of Forestry (member), Committee of unutilized bamboo natural resources in Miyadsu city, Kyoto Pref. (chairman), Committee for Satoyama Corridor along Yura River (chairman), Committee for Social System Construction by Woody houses (member)

- Ando, Makoto : Special Committee of the Meeting for the Promotion of the Forest of Traditional Culture in Kyoto (Member), Sakamoto Shougakkai (Director), Committee of Forest Promotion in Shibeche-cho (Member), Committee of Revegetation in Shibeche-cho (Member)

- Hasegawa, Hisashi : Committee of forest planning in Hyogo Prefecture (Member), Executive Committee of Forest Owners database in Northeast Okayama Prefecture (Chairman), Committee of House Building for Takatsu River (Member), Forest Deliberative Council in Hyogo Prefecture (Member), Survey Committee for Thinning Promotion (Member), Committee on Introducing Advanced Forest Machine (Member), Estimation Council for Project in Shikoku Branch of FFPRI (Assesment), Developing Committee for New Forest Operation System (Member), Administration Committee for Introducing Advanced Forest Machine in Okayama (Member), Administration Committee for Introducing Advanced Forest Machine in Hiyoshi (Member), Council for damages on Ashiu forest from animals (Member)

- Tokuchi, Naoko : Committee of Environment, Kyoto City (Member), Committee of Environment, Yawata City (Member), Committee of Environment, Nagaokakyo City (Member), Committee of Forest Management in Nishiyama (Chairman), Committee of Forest Management in Tennouzan (Advisor)