

Three Decades of Research at Huteson Memorial Forest, New Jersey (USA)

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Abstract. Three decades of research at the William L. Huteson Memorial Forest have resulted in 123 published articles, 66 doctoral and master's theses, and 73 published abstracts. References for these are presented.

The William L. Huteson Memorial Forest in Franklin Township, New Jersey, was established in 1955 with two primary objectives: (1) to maintain the old woods in their natural state, and (2) to study the natural ecological and evolutionary processes present.

Because of this focus on research, the tract has become one of the most intensively studied ecological areas in the world. Some 25-40 projects are ongoing at any given time, with a priority on long-term research, for which a protected permanent tract of land is uniquely suited. Most studies have been done by Rutgers University faculty and students, although investigators from institutions across the eastern United States and beyond have been welcomed and have contributed significantly.

This bibliography updates Small's (1973) list of publications, which included 58 articles and 22 abstracts from 1952 to 1973.

Studies done entirely or in part at Huteson Memorial Forest to date have resulted in 123 published articles. Two of the journals in which articles most frequently appear are leading North American journals: *Ecology* (18 articles) and *Bulletin of the Torrey Botanical Club* (15 articles). In addition, 31 articles have been published in the *William L. Huteson Memorial Forest Bulletin*.

Approximately 62% of the articles have focused on the old woods, with the remaining articles concentrated on the fields of various ages. While most of the articles are conceptual in approach, the primary objects of study in the 122 articles have been as follows: ecosystem or plant community (39), plant succession (9), plant populations (12), algae (2), mammals (4), birds (18), amphibians (1), beetles (10), moths and butterflies (8), other arthropods (6), fire (2), climate (2), soil and nutrients (7), and bibliography (2).

Sixty-six Rutgers University students have done all or part of their graduate thesis research at Huteson Memorial Forest. Forty received the master's degree and 26 the Ph.D.

Presentations of research at professional meetings have resulted in 73 published abstracts.

The total research effort listed below has been carried out by 118 scientists. Additional research which is not tabulated here includes undergraduate student research projects, studies which did not result in publication or thesis, and ongoing research projects.

The William L. Huteson Memorial Forest may be unique for a natural ecological area, because the deed stipulates that the area must be studied. The linkage of protection and research has been enormously synergistic over the past three decades, and is a model to recommend.

I. Published Research Articles

- Bard, Gily E. 1952. Secondary succession on the Piedmont of New Jersey. *Ecol. Monogr.* 22: 195-215.
Schneider, George H., Jr. 1952. *Geum canadense*, a study of its seasonal periodicity in New Jersey. *So. Appal. Bot. Club* 17:117-128.
Bard, Gily E. 1954. Mettler's Woods. *Garden Jour.* 4: 105-107.
Barnett, Lincoln. 1954. The woods of home. *Life Mag.* 37 (19): 78-100.
Blackburn, Benjamin. 1954. Mettler's Woods in New Jersey. *Bull. Gard. Club. Amer.* 42: 44-47.
Buell, Murray F., Helen F. Buell, and John A. Small. 1954. Fire in the history of Mettler's Woods. *Bull. Torrey Bot. Club* 81: 253-255.
Cunningham, John T. 1954. Woodland treasure. *Audubon Mag.* 56: 154-157.
Wolbarst, John. 1954. You can save Mettler's Woods. Flower grower—the Home Gard. Mag.
Anderson, Yoko O. 1955. Seasonal development in sun and shade leaves. *Ecology* 36: 430-439.
Sparkes, Charles H., and Murray F. Buell. 1955. Microclimatological features of an old field and an oak-hickory forest in New Jersey. *Ecology* 36: 363-364.
Buell, Murray F. 1957. The mature oak forest of Mettler's Woods. *William L. Huteson Mem. For. Bull.* 1: 16-19.
Connor, Jane, Neil F. Shimp, and John C.F. Tedrow. 1957. A spectrographic study of the distribution of trace elements in some podzolic soils. *Soil Sci.* 83: 65-73.
Monk, Carl D. 1957. Plant communities of the Huteson Memorial Forest based on shrub distribution. *Bull. Torrey Bot. Club* 84: 198-206.

- Monk, Carl D. 1959. Note on radial tree growth. Bull. Torrey Bot. Club 86: 199-201.
- Pearson, Paul G. 1959. Small mammals and old-field succession on the Piedmont of New Jersey. Ecology 40: 249-255.
- Small, John A. 1959. Skunk cabbage, *Symplocarpus foetidus*. Bull. Torrey Bot. Club 86: 413-421.
- Levin, Michael H. 1960. Studies on the ecological life history of *Saxifraga virginiana*. Bull. Torrey Bot. Club 87: 348-354.
- Swinebroad, Jeff. 1960. Additional notes on the singing height of ovenbirds. Wilson Bull. 72: 289-290.
- Wirtz, William O., and Paul G. Pearson. 1960. A preliminary analysis of habitat orientation in *Microtus* and *Peromyscus*. Amer. Midl. Natur. 63: 131-142.
- Buell, Murray F., Helen F. Buell, John A. Small, and Carl D. Monk. 1961. Drought effect on radial growth of trees in the William L. Hutcheson Memorial Forest. Bull. Torrey Bot. Club 88: 176-180.
- Monk, Carl D. 1961. Past and present influences on reproduction in the William L. Hutcheson Memorial Forest, New Jersey. Bull. Torrey Bot. Club 88: 167-175.
- Monk, Carl D. 1961. The vegetation of the William L. Hutcheson Memorial Forest, New Jersey. Bull. Torrey Bot. Club 88: 156-166.
- Small, John A. 1961. Drought response in William L. Hutcheson Memorial Forest. Bull. Torrey Bot. Club 88: 180-183.
- Taub, Frieda B. 1961. The distribution of the red-backed salamander, *Plethodon c. cinereus*, within the soil. Ecology 42: 681-696.
- Swinebroad, Jeff. 1962. An annotated list of the birds of Hutcheson Forest, N.J. Bull. N.J. Acad. Sci. 7:1-6.
- Frei, Karen R., and David E. Fairbrothers. 1963. Floristic study of the William L. Hutcheson Memorial Forest (New Jersey). Bull. Torrey Bot. Club 90: 338-355.
- Root, Peter G., and Paul G. Pearson. 1964. Small mammals in the early stages of old field succession on the New Jersey Piedmont. Bull. N.J. Acad. Sci. 9: 21-26.
- Ugolini, Fiorenzo C. 1964. Soil development on the red beds of New Jersey. William L. Hutcheson Mem. For. Bull. 2(1): 1-34.
- Ambler, Miroslava A. 1965. Seven alien plant species. William L. Hutcheson Mem. For. Bull. 2(2): 1-8.
- Haines, Elizabeth M. 1965. The distribution of *Fagus grandifolia* in Hutcheson Memorial Forest, New Jersey. Bull. N.J. Acad. Sci. 10:12-21.
- Reiners, Norma M., and William A. Reiners. 1965. Natural harvesting of trees. William L. Hutcheson Mem. For. Bull. 2(2): 9-17.
- Dansereau, Pierre, Peter F. Buell, and Ronald Dagon. 1966. A universal system for recording vegetation. II. A methodological critique and an experiment. Sarracenia 10: 1-64.
- Wales, Bruce A. 1967. Climate, microclimate and vegetation relationships on north and south forest boundaries in New Jersey. William L. Hutcheson Mem. For. Bull. 2(3): 1-60.
- Botkin, Daniel B., and Charles R. Malone. 1968. Efficiency of net primary production based on light intercepted during the growing season. Ecology 49: 438-444.
- Malone, Charles R. 1968. Determination of peak standing crop biomass of herbaceous shoots by the harvest method. Amer. Midl. Natur. 79: 429-435.
- Shubeck, Paul P. 1968. Orientation of carrion beetles to carrion: Random or non-random? J. N.Y. Entomol. Soc. 76: 253-265.
- Shubeck, Paul P. 1968. Trapping Fabre's "sexton" beetles. Amer. Biol. Teacher 30: 564-565.
- Buell, Murray F. 1969. Preserving New Jersey's vegetation. New Jersey Nature News 24: 154-159.
- Shubeck, Paul P. 1969. Ecological studies of carrion beetles in Hutcheson Memorial Forest. J. N.Y. Entomol. Soc. 77: 138-151.
- Shure, Donald J., and Paul G. Pearson. 1969. Distribution of P^{32} in *Ambrosia artemisiifolia*; its implication for trophic transfer studies. Ecology 50: 724-726.
- Shubeck, Paul P. 1970. Silphidae attraction to carrion-baited air cans versus carrion-baited ground cans. Coleopterists' Bull. 24: 66-70.
- Shure, Donald J. 1970. Limitations in radiotracer determination of consumer trophic positions. Ecology 51: 899-901.
- Buell, Murray F., Helen F. Buell, John A. Small, and Thomas G. Siccamo. 1971. Invasion of trees in secondary succession on the New Jersey Piedmont. Bull. Torrey Bot. Club 98: 67-74.
- Christianson, John D. 1971. The effect of surface fires on three species of hardwood tree seedlings. William L. Hutcheson Mem. For. Bull. 2(4): 1-5.
- Leck, Charles F. 1971. Recent records on the avifauna of Hutcheson Memorial Forest. William L. Hutcheson Mem. For. Bull. 2(4): 25.
- Middendorf, Peggy A. 1971. Trophic relationships and phosphorus budget of an old field soil ecosystem. William L. Hutcheson Mem. For. Bull. 2(4): 6-14.
- Shubeck, Paul P. 1971. Diel periodicities of certain carrion beetles (Coleoptera: Silphidae): Coleopterists' Bull. 25: 41-46.
- Shure, Donald J. 1971. Insecticide effects on early succession in an old field ecosystem. Ecology 52: 271-279.
- Small, John A., Murray F. Buell, Helen F. Buell, and Thomas G. Siccamo. 1971. Old-field succession on the New Jersey Piedmont—the first year. William L. Hutcheson Mem. For. Bull. 2(4): 26-30.
- Sulser, Judy S. 1971. Twenty years of change in the Hutcheson Memorial Forest. William L. Hutcheson Mem. For. Bull. 2(4): 15-24.
- Kenny, John, and Charles Leck. 1972. Longevity record for an ovenbird: Eight years. Bird Banding 43: 214.

- Kricher, John C. 1972. Bird species diversity: The effect of species richness and equitability on the diversity index. *Ecology* 53: 278-282.
- Rotsettis, James, James A. Quinn, and David E. Fairbrothers. 1972. Growth and flowering of *Danthonia sericea* populations. *Ecology* 53: 227-234.
- Siccama, Thomas G. 1972. A computer technique for illustrating three variables in a pictogram. *Ecology* 53: 177-181.
- Wales, Bruce A. 1972. Vegetation analysis of north and south edges in a mature oak-hickory forest. *Ecol. Monogr.* 42: 451-471.
- Buell, Murray F., Helen F. Buell, and John A. Small. 1973. Periodicity of tree growth in Hutcheson Memorial Forest. *William L. Hutcheson Mem. For. Bull.* 3(1): 24-26.
- Kricher, John C. 1973. Summer bird species diversity in relation to secondary succession on the New Jersey Piedmont. *Amer. Midl. Natur.* 89: 121-137.
- Leck, Charles F. 1973. Butterflies of Hutcheson Memorial Forest and their ecological organization. *William L. Hutcheson Mem. For. Bull.* 3(1): 1-2.
- Monte, Judith A. 1973. The successional convergence of vegetation from grassland and bare soil on the Piedmont of New Jersey. *William L. Hutcheson Mem. For. Bull.* 3(1): 3-13.
- Robichaud, Beryl, and Murray F. Buell. 1973. *Vegetation of New Jersey. A Study of Landscape Diversity.* Rutgers Univ. Press. New Brunswick, N.J. 340 p.
- Sempervivo, Judy G. 1973. Phenology and germination in *Stellaria media* (L.) Cyrill. *William L. Hutcheson Mem. For. Bull.* 3(1): 14-23.
- Shure, Donald J. 1973. Radionuclide tracer analysis of trophic relationships in an old-field ecosystem. *Ecol. Monogr.* 43: 1-19.
- Shure, Donald J., and Alan J. Lewis. 1973. Dew formation and stem flow on common ragweed (*Ambrosia artemisiifolia*). *Ecology* 54: 1152-1155.
- Small, John A. 1973. Publications involving studies at the William L. Hutcheson Memorial Forest. *William L. Hutcheson Mem. For. Bull.* 3(1): 27-29.
- Quinn, James A. 1974. *Convolvulus sepium* in old field succession on the New Jersey Piedmont. *Bull. Torrey Bot. Club* 101: 89-95.
- Bowker, Leslie S., and Paul G. Pearson. 1975. Habitat orientation and interspecific interaction of *Microtus pennsylvanicus* and *Peromyscus leucopus*. *Amer. Midl. Natur.* 94: 491-496.
- Draggan, Sidney. 1975. Diazinon and carbaryl: Effects on the vegetation of a soybean ecosystem. *Bull. N.J. Acad. Sci.* 20: 1-4.
- Forman, Richard T.T., and Bruce A. Elfstrom. 1975. Forest structure comparison of Hutcheson Memorial Forest and eight old woods on the New Jersey Piedmont. *William L. Hutcheson Mem. For. Bull.* 3(2): 44-51.
- Kricher, John C. 1975. Diversity in two wintering bird communities: Possible weather effects. *Auk* 92: 766-777.
- Lang, Gerald E. 1975. Litter dynamics in a mixed oak forest on the New Jersey Piedmont. *Bull. Torrey Bot. Club* 101: 277-286.
- Leck, Charles F. 1975. A bird-banding report from Hutcheson Memorial Forest: A summary of three seasons. *Eastern Bird-Banding Assoc. News* 38: 131-132.
- Leck, Charles F. 1975. The breeding bird populations of Hutcheson Memorial Forest: Biomass and feeding niches. *William L. Hutcheson Mem. For. Bull.* 3(2): 31-33.
- Leck, Charles F. 1975. Hutcheson Memorial Forest property. In C.F. Leck, *Birds of New Jersey.* Rutgers Univ. Press., New Brunswick, N.J. 190 p.
- Shubeck, Paul P. 1975. Do diurnal carrion beetles use sight, as an aid to olfaction, in locating carrion? *William L. Hutcheson Mem. For. Bull.* 3(2): 36-39.
- Shubeck, Paul P. 1975. Flight activity of certain carrion beetles: *Silpha noveboracensis*, Staphylinidae, Histeridae. *William L. Hutcheson Mem. For. Bull.* 3(2): 40-43.
- Stout, Benjamin B., Jean Marc Deschenes, and Lewis F. Ohmann. 1975. Multi-species model of a deciduous forest. *Ecology* 56: 226-231.
- Willemse, Roger W. 1975. Dormancy and germination of common ragweed seeds in the field. *Amer. J. Bot.* 62: 639-643.
- Willemse, Roger W. 1975. Effect of stratification temperature and germination temperature on germination and the induction of secondary dormancy in common ragweed seeds. *Amer. J. Bot.* 62: 1-5.
- Allen, Edith Bach, and Richard T.T. Forman. 1976. Plant species removals and old-field community structure and stability. *Ecology* 57: 1233-1243.
- Galli, Anne E., Charles F. Leck, and Richard T.T. Forman. 1976. Bird species diversity and forest islands in central New Jersey. *Auk* 93: 356-364.
- Forman, Richard T.T., Anne E. Galli, and Charles F. Leck. 1976. Forest size and avian diversity in New Jersey woodlots with some land use implications. *Oecologia* 26: 1-8.
- Jackson, James R., and Roger W. Willemse. 1976. Allelopathy in the first stages of secondary succession on the Piedmont of New Jersey. *Amer. J. Bot.* 63: 1015-1023.
- Panebianco, Robert, and Roger W. Willemse. 1976. Seed germination of *Hieracium pratense*, a successional perennial. *Bot. Gaz.* 137: 255-261.
- Shubeck, Paul P. 1976. An alternative to pitfall traps in carrion beetle studies (Coleoptera). *Entomol. News* 87(5&6): 176-178.
- Shubeck, Paul P. 1976. Carrion beetle responses to poikilotherm and homiotherm carrion (Coleoptera: Silphidae). *Entomol. News* 87(9&10): 265-269.
- Leck, Charles F. 1977. Additions to the birds known from Hutcheson Memorial Forest. *William L. Hutcheson Mem. For. Bull.* 4(1): 3-4.
- Leck, Charles F. 1977. A note on the energy demands of the breeding bird community of Hutcheson Me-

- memorial Forest. William L. Hutcheson Mem. For. Bull. 4(1): 1-2.
- Moulding, Jonathan D. 1977. The progression of a gypsy moth invasion of a mature oak forest in New Jersey. William L. Hutcheson Mem. For. Bull. 4(1): 5-11.
- Sciarappa, William J., Jr., and Fred C. Swift. 1977. Biological studies of *Typhlodromips sessor* (Acarina: Phytoseiidae). Ann. Entomol. Soc. Amer. 70: 285-288.
- Sciarappa, William J., Jr., Fred C. Swift, and C. Barry Knisley. 1977. Distribution, abundance and inter-specific associations of *Typhlodromips sessor* (Acarina: Phytoseiidae). Ann. Entomol. Soc. Amer. 70: 955-959.
- Shubeck, Paul P., Norman M. Downie, Rupert L. Winzel, and Stewart B. Peck. 1977. Species composition of carrion beetles in a mixed-oak forest. William L. Hutcheson Mem. For. Bull. 4(1): 12-17.
- Lang, Gerald E., and Richard T.T. Forman. 1978. Detrital dynamics in a mature oak forest: Hutcheson Memorial Forest, New Jersey. Ecology 59: 580-595.
- Casey, Timothy M. 1979. Flight energetics of gypsy moths and tent caterpillars—similar mass but different shapes. Amer. Zool. 19: 898.
- Frye, Richard J., II, and James A. Quinn. 1979. Forest development in relation to topography and soil on a floodplain of the Raritan River, New Jersey. Bull. Torrey Bot. Club. 106: 334-345.
- Hunt, Margo E., Gary L. Floyd, and Benjamin B. Stout. 1979. Soil algae in field and forest environments. Ecology 60: 362-375.
- Moulding, Jonathan D., and John J. Madenjian. 1979. Macrolepidopteran moths light-trapped in a New Jersey oak forest (Lepidoptera). Proc. Entomol. Soc. Wash. 81: 135-144.
- Buell, Murray F., Helen F. Buell, John A. Small, Thomas G. Siccama, and Gily E. Bard. 1980. Radial growth of trees in the William L. Hutcheson Memorial Forest. William L. Hutcheson Mem. For. Bull. 5: 1-71.
- Casey, Timothy M. 1980. Flight energetics and heat exchange of gypsy moths in relation to air temperature. J. Exp. Biol. 88: 133-145.
- Pickett, Steward T.A., and Jeffrey S. Kempf. 1980. Branching patterns in forest shrubs and understory trees in relation to habitat. New Phytol. 86: 219-228.
- Stiles, Edmund W. 1980. Patterns of fruit presentation and seed dispersal in bird-disseminated woody plants in the eastern deciduous forest. Amer. Natur. 116: 670:688.
- Casey, Timothy M. 1981. Energetics and thermoregulation of *Malacosoma americanum* (Lepidoptera: Lasiocampidae) during hovering flight. Physiol. Zool. 54: 362-371.
- Casey, Timothy M., Jeri R. Hegel, and Charlene S. Buser. 1981. Physiology and energetics of pre-flight warm-up in the eastern tent caterpillar moth *Malacosoma americanum*. J. Exp. Biol. 94: 119-135.
- Collins, Beverly S., and James A. Quinn. 1982. Displacement of *Andropogon scoparius* on the New Jersey Piedmont by the successional shrub *Myrica pensylvanica*. Amer. J. Bot. 69: 680-689.
- Davison, Sara E. 1981. Tree seedling survivorship at Hutcheson Memorial Forest. William L. Hutcheson Mem. For. Bull. 6(1): 4-7.
- Forman, Richard T.T., and Michel Godron. 1981. Patches and structural components for a landscape ecology. BioScience 31: 733-740.
- Forman, Richard T.T. 1981. Interactions among landscape elements: A core of landscape ecology. In Perspectives in Landscape Ecology. Proc. Int. Congr. Landscape Ecol., 1981, Veldhoven. Pudoc Publ., Wageningen, The Netherlands. Pp. 35-48.
- Kempf, Jeffrey S., and Steward T.A. Pickett. 1981. The role of branch length and angle in branching pattern of forest shrubs along a successional gradient. New Phytol. 88: 111-116.
- Leck, Charles F. 1981. Recent records of rarer birds at Hutcheson Memorial Forest. William L. Hutcheson Mem. For. Bull. 6(1): 16.
- Leck, Charles F., Bertram G. Murray, Jr., and Jeff Swinebroad. 1981. Changes in breeding bird populations at Hutcheson Memorial Forest since 1958. William L. Hutcheson Mem. For. Bull. 6(1): 8-15.
- Moul, Edwin T., and Peter A. Roff. 1981. The ecology, periodicity, and taxonomy of the algae of an intermittent stream in Hutcheson Forest. William. L. Hutcheson Mem. For. Bull. 6(1): 17-20.
- Robertson, G. Philip, and Peter M. Vitousek. 1981. Nitrification potentials in primary and secondary succession. Ecology 62: 376-386.
- Davison, Sara E., and Richard T.T. Forman. 1982. Herb and shrub dynamics in a mature oak forest: A thirty-year study. Bull. Torrey Bot. Club 109: 64-73.
- McDonnell, Mark J., and Edmund W. Stiles. 1983. The structural complexity of old-field vegetation and the recruitment of bird-dispersed plants. Oecologia 56: 109-116.
- Pickett, Steward T.A. 1982. Population patterns through twenty years of old-field succession. Vegetatio 49: 45-59.
- Robertson, G. Philip. 1982. Factors regulating nitrification in primary and secondary succession. Ecology 64: 1561-1573.
- Stiles, Edmund W. 1982. Expansions of mockingbird and multiflora rose in the northeastern United States and Canada. Amer. Birds 36: 358-364.
- Stiles, Edmund W. 1982. Fruit flags. Two hypotheses. Amer. Natur. 120: 500-509.
- Buell, Helen F., and Richard T.T. Forman. 1983. Three decades of research at Hutcheson Memorial Forest, New Jersey (USA). William L. Hutcheson Mem. For. Bull. 6(2): 24-32.
- Casey, Timothy M., and Barbara A. Joos. 1983. Morphometrics, conductance, thoracic temperature and flight energetics of noctuid and geometrid moths. Physiol. Zool. 56 (in press).

- Cocking, W. Dean, and Richard T.T. Forman. 1983. Vegetation responses of an old-field ecosystem to single and repeated sulfur dioxide disturbance. William L. Hutcheson Mem. For. Bull. 6(2): 4-19.
- Leck, Charles F., Sharon Ann Brady, and Wade Wander. 1983. The effects of canopy opening on breeding and migrant birds at Hutcheson Memorial Forest. William L. Hutcheson Mem. For. Bull. 6(2): 20-23.
- Nicola, Alexandra, and Steward T.A. Pickett. 1983. The adaptive architecture of shrub canopies: Leaf display and biomass allocation in relation to light environment. New Phytol. 93 (in press).

II. Doctoral and Master's Theses

- Bard, Gily E. 1951. A study of secondary succession on the Piedmont Plateau of New Jersey. Ph.D. Rutgers Univ., New Brunswick, NJ (Adviser: M. Buell).
- Schneider, George H., Jr. 1952. *Geum canadense*, a study of its seasonal periodicity in New Jersey. M.S. Rutgers Univ., New Brunswick, NJ (Adviser: M. Buell).
- Sparkes, Charles H. 1952. Some aspects of microclimatic diversity in an intermediate stage of succession on the Piedmont of New Jersey. M.S. Rutgers Univ., New Brunswick, NJ (Adviser: M. Buell).
- Anderson, Yoko. 1954. Seasonal development in sun and shade leaves. M.S. Rutgers Univ., New Brunswick, NJ (Adviser: M. Buell).
- Connor, Jane. 1956. The distribution of trace elements in ten soil profiles: Spectrochemical methods and results. Ph.D. Rutgers Univ., New Brunswick, NJ (Adviser: J. Tedrow).
- Monk, Carl D. 1956. Plant communities of the William L. Hutcheson Memorial Forest based on the pattern of shrub distribution. M.S. Rutgers Univ., New Brunswick, NJ (Adviser: M. Buell).
- Siburn, John J. 1956. An ecological survey of the mosses of the William L. Hutcheson Memorial Forest. M.S. Rutgers Univ., New Brunswick, NJ (Adviser: E. Moul).
- Taub, Frieda B. 1957. A comparative ecological study of *Plethodon c. cinereus* and *Eurycea b. bislineata*. M.S. Rutgers Univ., New Brunswick, NJ (Adviser: P. Pearson).
- Adjemovitch, Mirosanda. 1958. A study of seven alien species in William L. Hutcheson Memorial Forest. M.S. Rutgers Univ., New Brunswick, NJ (Adviser: J. Small).
- Monk, Carl D. 1959. The vegetation of the William L. Hutcheson Memorial Forest, New Jersey. Ph.D. Rutgers Univ., New Brunswick, NJ (Adviser: M. Buell).
- Taub, Frieda B. 1959. The spatial and temporal distributions of *Plethodon c. cinereus* and *Eurycea b. bislineata*. Ph.D. Rutgers Univ., New Brunswick, NJ (Adviser: P. Pearson).
- Levin, Michael H. 1960. Studies on the ecological life history of *Saxifraga virginiana*. M.S. Rutgers Univ., New Brunswick, NJ (Adviser: M. Buell).
- Ugolini, Fiorenzo. 1960. Soil development of the red beds of New Jersey. Ph.D. Rutgers Univ., New Brunswick, NJ (Adviser: J. Tedrow).
- Frei, Karen R. 1961. A floristic study of the William L. Hutcheson Memorial Forest. M.S. Rutgers Univ., New Brunswick, N.J. (Adviser: D. Fairbrothers).
- Root, Peter G. 1961. A study of small mammals in the early stages of old field succession on the New Jersey Piedmont. M.S. Rutgers Univ., New Brunswick, NJ (Adviser: P. Pearson).
- Roff, Peter A. 1963. A study of the ecology, taxonomy and periodicity of the fresh water algae of a small intermittent stream. M.S. Rutgers Univ., New Brunswick, NJ (Adviser: E. Moul).
- Reiners, Norma M. 1964. The natural harvesting of trees in the William L. Hutcheson Memorial Forest. M.S. Rutgers Univ., New Brunswick, NJ (Adviser: M. Buell).
- Bowker, Leslie S., Jr. 1965. Habitat orientation and interactions of *Microtus pennsylvanicus* and *Peromyscus leucopus* under natural field conditions. M.S. Rutgers Univ., New Brunswick, NJ (Adviser: P. Pearson).
- Haines, Elizabeth M. 1965. A study of the distribution of *Fagus grandifolia* in Hutcheson Memorial Forest, New Jersey. M.S. Rutgers Univ., New Brunswick, NJ (Adviser: M. Buell).
- Wales, Bruce A. 1966. Some relationships between climate, microclimate and vegetation on north and south forest boundaries in New Jersey. M.S. Rutgers Univ., New Brunswick, NJ (Adviser: A. Havens).
- Shubeck, Paul P. 1967. Ecological studies of necrophagous beetles in Hutcheson Memorial Forest. Ph.D. Rutgers Univ., New Brunswick, NJ (Adviser: P. Pearson).
- Deschenes, Jean Marc. 1968. *Acer saccharum* near and at the periphery of its range in New Jersey. Ph.D. Rutgers Univ., New Brunswick, NJ (Adviser: M. Buell).
- Christianson, J.D. 1969. The effects of fire on hardwood tree species in New Jersey. Ph.D. Rutgers Univ., New Brunswick, N.J. (Adviser: M. Buell).
- Greenlaw, Jon S. 1969. The importance of food in the breeding system of rufous-sided towhee, *Pipilo erythrrophthalmus* (L.). Ph.D. Rutgers Univ., New Brunswick, NJ (Adviser: P. Pearson).
- Shure, Donald J. 1969. Insecticide contamination and trophic relationships in a first-year, old-field ecosystem. Ph.D. Rutgers Univ., New Brunswick, NJ (Adviser: P. Pearson).
- Wales, Bruce A. 1969. Edge characteristics of a mature oak-hickory forest. Ph.D. Rutgers Univ., New Brunswick, NJ (Adviser: M. Buell).
- Beimborn, William A. 1970. Establishment ecology of gray goldenrod (*Solidago nemoralis* Ait.). M.S.

- Rutgers Univ., New Brunswick, NJ (Adviser: M. Buell).
- Fleet, Harvey. 1970. The inhibition of perennial plants by annuals on first-year old fields. M.S. Rutgers Univ., New Brunswick, NJ (Adviser: M. Buell).
- Kricher, John C. 1970. Bird species diversity in relation to secondary succession on the New Jersey Piedmont. Ph.D. Rutgers Univ., New Brunswick, NJ (Adviser: P. Pearson).
- Merchant, Henry C. 1970. Estimated energy budget of the red-backed salamander, *Plethodon cinereus*. Ph.D. Rutgers Univ., New Brunswick, NJ (Adviser: P. Pearson).
- Middendorf, Peggy A. 1970. Trophic relationships and insecticide response of an old field soil ecosystem. M.S. Rutgers Univ., New Brunswick, NJ (Adviser: P. Pearson).
- Rotsettis, James. 1970. Flowering and fruiting in populations of *Danthonia sericea* under field and laboratory conditions. M.S. Rutgers Univ., New Brunswick, NJ (Adviser: J. Quinn).
- Sulser, Judy A.S. 1970. The vegetation of the William L. Hutcheson Memorial Forest: A quantitative comparison of twenty years. M.S. Rutgers Univ., New Brunswick, NJ (Adviser: M. Buell).
- Knight, Peter T. 1971. Ecological impact of two short-lived insecticides upon the soil macroscopic invertebrate populations. M.S. Rutgers Univ., New Brunswick, NJ (Adviser: P. Pearson).
- Lewis, Alan J. 1971. The effects of chemical and mechanical manipulation of old-field plant populations; an evaluation of ragweed control techniques. Ph.D. Rutgers Univ., New Brunswick, NJ (Adviser: M. Buell).
- Monte, Judith A. 1971. The successional convergence of vegetation from grassland and bare soil on the Piedmont of New Jersey. M.S. Rutgers Univ., New Brunswick, NJ (Adviser: M. Buell).
- Robichaud, Beryl. 1971. Vegetation of New Jersey: A study of landscape diversity. Ph.D. Rutgers Univ., New Brunswick, NJ (Adviser: M. Buell).
- Taylor, Joan R. 1971. Failure of reproduction in *Microtus pennsylvanicus*. M.S. Rutgers Univ., New Brunswick, N.J. (Adviser: P. Pearson).
- Fleet, Harvey. 1972. Inhibition of perennials by yellow foxtail on first-year old fields. Ph.D. Rutgers Univ., New Brunswick, NJ (Adviser: J. Quinn).
- Kenny, John F., Jr. 1972. A comparison of bird censusing techniques. M.S. Rutgers Univ., New Brunswick, NJ (Adviser: C. Leck).
- Russo, Paul M. 1972. Behavioral thermoregulation and energy budget of the eastern box turtle, *Terrapene carolina carolina* (Linne). Ph.D. Rutgers Univ., New Brunswick, NJ (Adviser: P. Pearson).
- Semprevivo, Judy G. 1972. Field phenology and germination in *Stellaria media* (L.) Cyrill. M.S. Rutgers Univ., New Brunswick, NJ (Adviser: M. Buell).
- Beimborn, William A. 1973. Physical factors affecting establishment of *Solidago nemoralis* on the New Jersey Piedmont. Ph.D. Rutgers Univ., New Brunswick, NJ (Adviser: J. Quinn).
- Cocking, W. Dean. 1973. Plant community damage and repairability following sulfur dioxide stress on an old-field ecosystem. Ph.D. Rutgers Univ., New Brunswick, NJ (Adviser: R. Forman).
- Draggan, Sidney. 1973. Diazinon and carbaryl: Effects on the soil biota of a soybean ecosystem. Ph.D. Rutgers Univ., New Brunswick, NJ (Adviser: P. Pearson).
- Lang, Gerald E. 1973. Litter accumulation through ecosystem development. Ph.D. Rutgers Univ., New Brunswick, NJ (Adviser: R. Forman).
- Wysolmerski, Theresa, C.S.J. 1973. Population distribution and bioenergetics of isopods in Hutcheson Memorial Forest. Ph.D. Rutgers Univ., New Brunswick, NJ (Adviser: P. Pearson).
- Bach, Edith. 1975. Plant species removals and community structure of old-fields on the New Jersey Piedmont. M.S. Rutgers Univ., New Brunswick, NJ (Adviser: R. Forman).
- Bosenberg, Robert H. 1975. Small mammals and ground cover in successional fields. M.S. Rutgers Univ., New Brunswick, NJ (Adviser: P. Pearson).
- Mekenian, Michael R. 1975. Germination of *Raphanus raphanistrum* L. in controlled and field environments. M.S. Rutgers Univ., New Brunswick, NJ (Adviser: R. Willemse).
- Rudis, Victor A. 1975. Urbanization as a multiple stress affecting forest soil arthropod communities. M.S. Rutgers Univ., New Brunswick, NJ (Adviser: R. Forman).
- St. Omer, Lucy. 1975. Edaphic algae in abandoned fields of the Piedmont of New Jersey. M.S. Rutgers Univ., New Brunswick, NJ (Adviser: G. Floyd).
- Elfstrom, Bruce A. 1976. Tree species diversity and forest island size on the Piedmont of New Jersey. M.S. Rutgers Univ., New Brunswick, NJ (Adviser: R. Forman).
- Hunt, Margo E. 1976. Dynamics of soil algae in field and forest environments. Ph.D. Rutgers Univ., New Brunswick, NJ (Adviser: G. Floyd).
- Jackson, James R. 1976. Allelopathy in the first stages of secondary succession on the Piedmont of New Jersey. Ph.D. Rutgers Univ., New Brunswick, NJ (Adviser: R. Willemse).
- Panebianco, Robert J. 1976. Seed germination characteristics of *Hieracium pratense*, a successional perennial. M.S. Rutgers Univ., New Brunswick, NJ (Adviser: R. Willemse).
- Frye, Darlene M. 1977. Seasonal changes in the subterranean portions of *Podophyllum peltatum* L. with respect to growth, reproduction and winter dormancy. Ph.D. Rutgers Univ., New Brunswick, NJ (Adviser: R. Willemse).
- Grover, Herbert D. 1977. The effects of P-coumaric acid and coumarin on seed germination, seedling

- growth and nutrient uptake of several old-field weed species. M.S. Rutgers Univ., New Brunswick, NJ (Adviser: R. Willemsen).
- Rueb, Richard R. 1976. Diversity and stability: An experimental study of stressed old-field ecosystem patches. M.S. Rutgers Univ., New Brunswick, NJ (Adviser: R. Forman).
- Silver, Stuart B. 1977. Patterns of nectar secretion in *Oenothera biennis* and *Linaria vulgaris*. M.S. Rutgers Univ., New Brunswick, NJ (Adviser: E. Stiles).
- Slezak, William F. 1976. *Lonicera japonica* Thunb., an aggressive introduced species in a mature forest ecosystem. M.S. Rutgers Univ., New Brunswick, NJ (Adviser: R. Forman).
- Wildman, Howard D. 1977. Environmental patch size in a first-year plant community. M.S. Rutgers Univ., New Brunswick, NJ (Adviser: R. Forman).
- Frye, Richard J., II. 1978. Structural dynamics of early old-field succession on the New Jersey Piedmont: A comparative approach. Ph.D. Rutgers Univ., New Brunswick, NJ (Adviser: J. Quinn).
- Collins, Beverly S. 1979. The successional displacement of *Andropogon scoparius* Mich. by *Myrica pensylvanica* Loisel. M.S. Rutgers Univ., New Brunswick, NJ (Adviser: J. Quinn).
- Davison, Sara E. 1980. Vegetational change in a mature oak forest: A thirty year study. M.S. Rutgers Univ., New Brunswick, NJ (Adviser: R. Forman).
- Nicola, Alexandra. 1981. The adaptive architecture of shrub canopies: Leaf display and biomass allocation in relation to light environment. M.S. Rutgers Univ., New Brunswick, NJ (Adviser: S. Pickett).
- Kricher, John C. 1969. Summer bird species diversity in relation to secondary succession on the New Jersey Piedmont. Bull. N.J. Acad. Sci. 14:53.
- Kricher, John C. 1969. Bird species diversity in relation to secondary succession on the New Jersey Piedmont. Bull. Ecol. Soc. Amer. 50: 100.
- Rotsettis, James, and James A. Quinn. 1969. Flowering of populations of the *Danthonia sericea* complex under field and laboratory conditions. Bull. Ecol. Soc. Amer. 50: 75.
- Russo, Paul M. 1969. The annual behavioral thermoregulation cycle in *Terrapene c. carolina*. Bull. Ecol. Soc. Amer. 50: 76.
- Russo, Paul M. 1969. The daily summer behavioral thermoregulation cycle in *Terrapene c. carolina*. Bull. N.J. Acad. Sci. 14: 54.
- Shure, Donald J. 1969. Insecticide effects on trophic relationships in an old field ecosystem. Bull. Ecol. Soc. Amer. 50: 67.
- Shure, Donald J., and Paul G. Pearson. 1969. Distribution of P^{32} in *Ambrosia artemisiifolia*; its implication for trophic transfer studies. Bull. Ecol. Soc. Amer. 50: 72-73.
- Fleet, Harvey. 1970. Inhibition of perennials by yellow foxtail grass on one year old fields. Bull. Ecol. Soc. Amer. 51:41.
- Kricher, John C. 1970. Bird species diversity—The effect of species richness and equitability on the diversity index. Bull. Ecol. Soc. Amer. 51: 41.
- Shure, Donald J. 1970. Radionuclide analysis of the trophic transfer from wild radish (*Raphanus raphanistrum*). Bull. Ecol. Soc. Amer. 51: 28.
- Beimborn, William A. 1971. Physical factors affecting establishment of *Solidago nemoralis* on the Piedmont of New Jersey. Bull. Ecol. Soc. Amer. 52: 53.
- Cocking, W. Dean. 1971. Sulfur dioxide damage from controlled fumigation of an old field ecosystem. Bull. Ecol. Soc. Amer. 52: 53.
- Draggan, Sidney, and Joann Roskoski. 1971. Diazinon and sevin: Effects on the soil biota of a soybean ecosystem. Bull. Ecol. Soc. Amer. 52: 34-35.
- Fleet, Harvey. 1971. Interactions of yellow foxtail grass and perennials on first year old fields. Bull. Ecol. Soc. Amer. 52: 49.
- Quinn, James A. 1971. Hedge bindweed (*Convolvulus sepium* L.) in New Jersey old field succession. Amer. J. Bot. 58: 460.
- Cocking, W. Dean. 1972. Sulfur dioxide as a stress on an old field ecosystem. Bull. Ecol. Soc. Amer. 53: 38.
- Lang, Gerald E. 1972. A model for litter accumulation through ecosystem development. Bull. Ecol. Soc. Amer. 53: 26.
- Wysolmerski, Theresa, C.S.J. 1973. Population distribution and bioenergetics study of isopod populations in Huteson Memorial Forest. Bull. Ecol. Soc. Amer. 43: 19.
- Beimborn, William A. 1974. Germination ecology of *Solidago nemoralis* (Compositae). Bull. Ecol. Soc.

III. Published Abstracts

- Small, John A. 1962. Early stages of succession in the William L. Huteson Memorial Forest Area. Bull. N.J. Acad. Sci. 7: 20.
- Small, John A., Murray F. Buell, and Helen F. Buell. 1963. *Paulownia tomentosa* in the William L. Huteson Memorial Forest. Bull. N.J. Acad. Sci. 8: 30.
- Dagon, Ronald R., and Peter F. Buell. 1966. A quantitative physiognomic description of seasonal changes in a mature oak stand in New Jersey (Huteson Memorial Forest). Bull. N.J. Acad. Sci. 11: 41.
- Botkin, Daniel B., and Charles R. Malone. 1967. Efficiency of net primary productivity of a first year old field. Bull. N.J. Acad. Sci. 12: 49.
- Fleet, Harvey. 1968. The inhibition of perennials by annuals on a one year old field. Bull. N.J. Acad. Sci. 13: 99.
- Beimborn, William A. 1969. Some aspects of water in the establishment ecology of gray goldenrod, *Solidago nemoralis* Aiton. Bull. N.J. Acad. Sci. 14: 54.
- Christianson, J. Dean. 1969. Heat tolerance of three species of New Jersey hardwood seedlings using tetrazolium chloride to test viability. Bull. N.J. Acad. Sci. 14: 53.

- Amer. 55: 20-21.
- Cocking, W. Dean 1974. Plant community repair following sulfur dioxide stress on an old-field ecosystem. Bull. Ecol. Soc. Amer. 55: 36.
- Elfstrom, Bruce A., and Richard T.T. Forman. 1974. Tree species diversity and forest island size on the New Jersey Piedmont. Bull. N.J. Acad. Sci. 19: 23.
- Forman, Richard T.T. 1974. Ecosystem size: A stress on the forest ecosystem. Bull. Ecol. Soc. Amer. 55: 38.
- Forman, Richard T.T., Anne E. Galli and Charles F. Leck. 1974. Bird species diversity and the size of forest "islands". Bull. Ecol. Soc. Amer. 55: 43.
- Lang, Gerald E. 1974. Changes in leaf litter dynamics through ecosystem development. Bull. Ecol. Soc. Amer. 55: 37.
- Mekenian, Michael R., and Roger W. Willemse. 1974. Germination characteristics of *Raphanus raphanistrum* in controlled and field environments. Bull. N.J. Acad. Sci. 19: 20.
- Murray, Edward W., and Richard T.T. Forman. 1974. Ecological parameters of arthropod populations and the size of forest "islands" in central New Jersey. Bull. Ecol. Soc. Amer. 55: 25.
- Willemse, Roger W. 1974. Comparison of laboratory stratification and field storage on germination of common ragweed seeds. Bull. N.J. Acad. Sci. 19: 21.
- Bach, Edith, and Richard T.T. Forman. 1975. Plant species removals and community structure of old fields. Bull. N.J. Acad. Sci. 20: 33.
- Jackson, James R., and Roger W. Willemse. 1975. The role of allelopathy in old field succession on the piedmont. Bull. N.J. Acad. Sci. 20: 33.
- Slezak, William F., and Richard T.T. Forman. 1975. Honeysuckle, an aggressive exotic in a mature ecosystem. Bull. N.J. Acad. Sci. 20: 34.
- Wildman, Howard D., and Richard T.T. Forman. 1975. Environmental patch size manipulation and plant community response. Bull. N.J. Acad. Sci. 20: 34.
- Bach, Edith, and Richard T.T. Forman. 1976. Plant species removals and old field community structure. Bull. Ecol. Soc. Am. 57: 15.
- Frye, Darlene M., and Roger W. Willemse. 1976. Winter dormancy in the subterranean buds of *Podophyllum peltatum*. Bull. N.J. Acad. Sci. 21: 18.
- Grover, Herbert D., and Roger W. Willemse. 1976. The effect of P-coumaric acid and coumarin on seed germination of old-field herbaceous species. Bull. N.J. Acad. Sci. 21: 18.
- Jackson, James R., and Roger W. Willemse. 1976. Allelopathic effects of ragweed and aster during old field succession on the Piedmont of New Jersey. Bull. Ecol. Soc. Am. 57: 15.
- Roos, Fred H., and James A. Quinn. 1976. r- and K-selection trends among successional populations of *Andropogon scoparius*. Bull. Ecol. Soc. Am. 57: 34.
- Rueb, Richard, and Richard T.T. Forman. 1976. Old field community and species responses to heat stress. Bull. N.J. Acad. Sci. 21: 21.
- Wildman, Howard D., and Richard T.T. Forman. 1976. Effect of environmental patch size on plant community structure. Bull. Ecol. Soc. Am. 57: 15.
- Batinsey, Janet M., and Roger W. Willemse. 1977. Seed dormancy and germination studies of velvetleaf. Bull. N.J. Acad. Sci. 22: 40.
- Frye, Darlene M. 1977. The effect of exogenous hormones on the buds of *Podophyllum peltatum* L. Bull. N.J. Acad. Sci. 22: 53.
- Frye, Richard J., II. 1977. Early old-field succession on the Piedmont of New Jersey: A temporal approach. Bull. N.J. Acad. Sci. 22: 40.
- Grover, Herbert D., and Roger W. Willemse. 1977. The effect of para-coumaric acid on seed germination, seedling growth, and mineral nutrition of several old-field herbaceous species. Bull. N.J. Acad. Sci. 33: 39-40.
- Rueb, Richard, and Richard T.T. Forman. 1977. Diversity and stability: An experimental study of stressed old field ecosystem patches. Bull. Ecol. Soc. Amer. 58: 6.
- Silver, Stuart B. 1977. Patterns of nectar secretion in two old-field plant species. Bull. N.J. Acad. Sci. 22:40.
- Slezak, William F., and Richard T.T. Forman. 1977. An introduced vine, *Lonicera japonica*, and a mature forest ecosystem. Hutcheson Memorial Forest. Bull. Ecol. Soc. Amer. 58: 41.
- Collins, Beverly S., and James A. Quinn. 1979. Bayberry and old-field succession on the New Jersey Piedmont. Bull. N.J. Acad. Sci. 24:92.
- Collins, Beverly S., and James A. Quinn. 1979. Displacement of *Andropogon scoparius* by the successional shrub *Myrica pensylvanica*. Bot. Soc. Amer. Miscell. Series, Pub 157: 22.
- Grover, Herbert D., and Roger W. Willemse. 1979. The effects of para-coumaric acid and coumarin on seed germination, seedling growth, and mineral nutrition of several old-field herbaceous species. Bull. Ecol. Soc. Amer. 60: 96.
- Pickett, Steward T.A., and Edmund W. Stiles. 1979. Bifurcation ratios as descriptors of branching strategy in shrubs. Bull. N.J. Acad. Sci. 24: 92.
- Pickett, Steward T.A., and Edmund W. Stiles. 1979. Strategic differentiation among forest shrubs. Bull. Ecol. Soc. Amer. 60: 126.
- Robertson, G. Philip. 1979. Potential nitrification in soils from different stages of primary and secondary succession. Bull. Ecol. Soc. Amer. 60: 86.
- Stiles, Edmund W. 1979. Timing of seed dispersal by birds for two understory shrubs. Bull. N.J. Acad. Sci. 24: 80-81.
- Davison, Sara E., and Richard T.T. Forman. 1980. Thirty years of vegetational change in an old oak woods, Hutcheson Memorial Forest, New Jersey. Bull. N.J. Acad. Sci. 25: 57-58.

- Pickett, Steward T.A., and Richard T.T. Forman. 1980. Invasion and turnover patterns over 22 years following old-field abandonment in New Jersey (U.S.A.). Proc. 1980 Symp. Dyn. Veg., Montpellier, France. Page 1-7.
- Chapman, Ellen, and James A. Quinn. 1980. Survivorship and sex ratio of red cedar (*Juniperus virginiana*) on the New Jersey Piedmont. Bull. N.J. Acad. Sci. 25: 65.
- Robertson, G. Philip. 1980. The control of potential nitrification in soils from different stages of primary and secondary succession. Bull. Ecol. Soc. Am. 61: 84.
- Forman, Richard T.T., and Michel Godron. 1981. Toward a landscape ecology: Patches and structural components. Bull. Ecol. Soc. Amer. 62: 169.
- McDonnell, Mark J. 1981. The structural complexity of old field vegetation and the recruitment of bird-dispersed plant species. Bull. N.J. Acad. Sci. 26: 72.
- Nicola, Alexandra, and Steward T.A. Pickett. 1981. Determination and ecological significance of the effective leaf area in four Piedmont shrubs. Bull. N.J. Acad. Sci. 26: 72.
- Rankin, Wilson T. 1981. Differential predation of first year woody seedlings along a successional gradient. Bull. N.J. Acad. Sci. 26: 71.
- White, Douglas. 1981. Do frugivorous birds show preferences in their use of fall ripening fruits? Bull. N.J. Acad. Sci. 26: 58.
- Breden, Thomas F., and Richard T.T. Forman. 1982. Defoliation of Hutcheson Memorial Forest, New Jersey by the gypsy moth. Bull. N.J. Acad. Sci. 27: 41.
- White, Douglas W. 1982. The influence of height on the use of staghorn sumac (*Rhus typhina*) fruits by birds. Bull. N.J. Acad. Sci. 27: 27.
- Armesto, Juan J., and Steward T.A. Pickett. 1982. Patterns of simulated grazing and old-field species richness. Bull. Ecol. Soc. Amer. 63: 71.
- McDonnell, Mark J. 1982. The structural complexity of old-field vegetation and recruitment of bird-dispersed plant species. Bull. Ecol. Soc. Amer. 63: 169.
- Breden, Thomas F., and Richard T.T. Forman. 1982. Defoliation of Hutcheson Memorial Forest, New Jersey, by the gypsy moth. Bull. Ecol. Soc. Amer. 63: 172.