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Hardy and Tropical Ferns at the Morris Arboretum Creating Working, Photo, and Archival Inventories

Title: Hardy and Tropical Ferns at the Morris Arboretum
Creating Working, Photo, and Archival Inventories

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Date: April 2003

Abstract:

The Morris Arboretum of the University of Pennsylvania holds a remarkable fern collection for an institution of its size. However, since the ferns are not a curated collection, the Arboretum has gaps in its knowledge of the fern species present, both in the Dorrance H. Hamilton Fernery and outdoors in the gardens. To document the hardy fern species present in 2003, I inventoried the grounds of the Morris Arboretum and identified all fern species present. I created an extensive list of ordering suggestions for future fern plantings. To document the ferns present in the Fernery in 2003, I created a fairly exhaustive inventory, took over 500 digital photographs, began the creation of a website, identified ferns in historical photos, and ordered new labels with up-to-date information. The information gathered documents the current status of the indoor and outdoor fern collections at the Morris Arboretum and will allow for greater access of information about ferns to the public.

TABLE OF CONTENTS

Introduction.....	3
HARDY FERNS--Methods and Results.....	4
THE FERNERY--Methods and Results	4
Conclusion	6
References.....	7
Acknowledgements.....	8
Appendix A. Hardy Ferns Present at the Morris Arboretum, By Species	9
Appendix B. Hardy Ferns Present at the Morris Arboretum, By Location	12
Appendix C. Recommended Hardy Fern Species for the Morris Arboretum.....	16
Appendix D. Fernery Inventory 2003.....	21
Appendix E. Request List for Fernery Labels	29
Appendix F. Fernery Species Present in 1997-1998 Photos	32
CD-ROM 1. Hardy Fern Information	
CD-ROM 2. Fernery Digital Photographs and Archival Information	

INTRODUCTION

The Morris Arboretum of the University of Pennsylvania naturally focuses much of its attention on woody plants, but its living collection also contains many non-woody species of great interest and importance. In particular, the Arboretum holds an impressive collection of ferns, especially the temperate to tropical ferns found in the Dorrance H. Hamilton Fernery. Because I arrived at the Morris Arboretum with a strong interest in pteridology (the study of ferns and fern allies) and some background in native and tropical fern identification, I devoted my intern project to cataloging and studying the fern collection.

Though most visitors associate the Morris Arboretum's ferns with the Fernery, there are many species of hardy ferns planted outdoors. Kate Deregibus, the English Park section leader, has been particularly instrumental in planting hardy ferns throughout the Arboretum. During the year, I sought out all the ferns on the grounds of Compton (John and Lydia Morris's original estate) and identified and inventoried them. The hardy ferns section will explain this process and its outcomes.

The most visible fern collection on the Morris Arboretum grounds is, of course, the Fernery. John and Lydia Morris revealed their personal "pteridomania", or love of ferns, as was fashionable in the Victorian era, by building the freestanding Fernery in 1899. They filled it with a global smattering of ferns and fern allies (including spikemosses and horsetails). The Fernery fell into disrepair over the years and passed through an unfortunate remodeling phase before being beautifully restored by the Dorrance H. Hamilton Foundation in 1994. At that point, the Fernery was emptied of its dwindling collection. Without any comprehensive historical record to stick to (or to be stuck with), the refurbished Fernery was planted with a variety of ferns available at the time. An inventory was completed shortly after planting, but this report contained many errors and several species were never properly identified. The lack of an accurate inventory is understandable. First, the Fernery is not a curated collection, and only a handful of individual plants are accessioned. Second, the locations of many ferns have changed as species thrive or fail while filling microclimatic niches in the Fernery building. Lastly, the Fernery is primarily cared for by a single volunteer, Dianne Smith, who must prioritize work in the Fernery and cannot be expected to keep records on every new species planted or removed – especially when many of the ferns she acquires come with an incorrect name tag! Therefore, I spent the bulk of my intern project organizing current Fernery information. I undertook the task of re-inventorying the Fernery, updating scientific names, species present, current locations, and other information. I also took several hundred digital photographs to document and archive the state of the Fernery in the year 2003. The Fernery section will describe these activities and related projects.

HARDY FERNS

Inventory. Beginning in fall 2002, I scoured the grounds of Compton for hardy ferns. I identified each species and recorded its location (see Appendices A and B). I found that the Morris Arboretum in 2003 has only 34 types (species, cultivars, forms, or subspecies) of hardy ferns – we have more types of roses in the Cottage Garden! The most diverse and abundant plantings of hardy ferns occurred in two places: Widener Woods and the hardy fern walk near the Rose Garden. Several areas of the Arboretum were especially devoid of ferns, most notably the wetland (natural areas), which would, ironically, provide the most suitable fern habitat. Fern abundance is so low in the wetland simply because it is a relatively new planting and ferns have not been a focus in plant purchasing.

Ordering Suggestions. To help section leaders include more ferns in their sections in the future, I created a list of recommended ferns that are both hardy to the Philadelphia area and available from North American suppliers (Appendix C). Many exciting new cultivars are included. To maintain the integrity of the natural areas, native ferns are marked as such. Each species on the list is labeled with one or more suppliers, and supplier information is included.

Archive Creation. CD-ROM 1 stores the hardy fern inventories of 2003 and the hardy fern suggestion list. Information (nativity, description, hardiness, etc.) on the hardy fern species present at the Morris Arboretum is available on CD-ROM 1 in a Microsoft PowerPoint file. This CD Appendix also contains information on several recommended hardy ferns.

FERNERY

Inventory. To update the Fernery inventory for 2003, I began with an Excel file created by former propagation Robin Degenhardt, who inventoried the Fernery in 1997-98. Many things had changed in the Fernery over just these few years. I expanded the inventory, adding information on updated Latin names, locations, and nativity (Appendix D). I standardized all Latin names using Jones's *Encyclopaedia of Ferns*. Reggie Whitehead, a self-taught fern expert from South Miami, Florida, visited the Fernery in March and helped identify the remaining unknown ferns.

While inventorying the Fernery over the course of several months, I noticed that certain species appeared in the Fernery despite never being planted. These self-recruiters included two aggressive *Pteris* or brake ferns. Additionally, *Cyrtomium falcatum* 'Rochfordianum' (Rochford's Japanese holly fern) and *Adiantum* (maidenhair) plants have spread dramatically, sowing themselves into cracks and onto walls when their spore is dispersed through the air. However, these species are easily controlled by weeding, and often look too nice to pull.

Photography. Since the Morris Arboretum slide library lacks a photograph of each species present in the Fernery, and since we have moved into the digital age, I chose to close the gap in the collection of fern images by taking digital photographs of each species (CD-ROM 2). I took photographs early in the morning, before the sunlight penetrated the Fernery too heavily and when obscuring shadows were at a minimum. When possible, I photographed not only the fern plant as a whole, but also the sori (spore-bearing bodies), which often allow for identification,

and other interesting features, especially crosiers or fiddleheads (developing fronds). In the end, my photo collection contains over 500 photographs that will allow interested individuals to peruse the fern collection, identify species, and discover what was present in the year 2003. The photos are organized by genus and species. I also took promotional photographs for use on the Morris Arboretum website; these are included in a separate folder on CD-ROM 2.

Ordering Suggestions. Several interesting (and commercially available) non-hardy ferns are recommended in Appendix C for ordering and planting in the Fernery.

Labels. Metal labels were ordered for the Fernery several years ago to mark species' Latin and common names. However, these labels are rusty and worn out. Many of the labels also contain nativity information, making the label too big next to a small, delicate fern and an eyesore for visitors trying to take pictures. Thus, I created a list of new labels to order (Appendix E), choosing the smallest, most inconspicuous metal label possible and omitting nativity information. Species were chosen in order to label interesting and unique ferns, but not so many labels will be placed as to clutter the Fernery. The list of recommended labels was submitted to the Plant Records and Curation departments in Spring 2003.

Information Binder. Though not specifically part of my intern project, a combination of the Fernery labels and my digital photographs can be used in the future to make an information binder to be placed inside the Fernery entrance. Ferns of interest will be labeled with a number on a stake. In the information binder, a thumbnail photograph of the species will appear next to the number, along with some basic information about the species.

Brochure. Picking up again where Robin Degenhardt (1997-98 intern) left off, I submitted her text for a Fernery brochure to the Marketing Department and to Bob Gutowski, accompanied by digital photos. A new Fernery brochure will soon be in the works.

Website. To most effectively utilize and organize the hundreds of digital photographs I took of the Fernery, I began to create a fernery website. Steve Claflin, a greenhouse volunteer with a strong knowledge of computers, taught me basic HTML code. I then started organizing a website in which the user clicks on a fern species in the inventory and is presented with photos of the plant, sori, and other parts and information about the fern. As of now, the Morris Arboretum has no extra server space to actually launch this website, but I hope to get this part of the project off the ground in the future.

Identification of Species in Historical Photographs. Robin Degenhardt left behind another unfinished project that I completed – the identification of fern species in photos from 1997-98. Fernery volunteer Dianne Smith had taken the photos and mounted them on foamboard with plastic overlays for labeling. I examined the photographs and made lists of the fern species I believed to be present in each (Appendix F). It was quite surprising to see how much had changed in only four or five years; I am reminded of the importance of my documenting process for 2003.

Archive Creation. How will interested people in the future know what was planted in the Fernery now, shortly after its restoration and replanting? Of course, my appendices contain paper copies of the 2003 Fernery inventory and details. I also saved digital photographs of each Fernery section to a CD (see CD-ROM 2). The 2003 Fernery inventory saved to this CD contains a spreadsheet for each Fernery section that corresponds to the photographs. Hopefully this information will be helpful to future Morris Arboretum pteridophiles.

CONCLUSION

Since they do not form a curated collection, the ferns at Morris Arboretum are often overlooked in terms of identification and historical documentation. My project will help to clear up confusion in naming and will document what is present in 2003. I hope that my suggestions will be used in future plant orders, especially to increase hardy fern abundance and diversity. These new fern types will add beauty, texture, and interest to the gardens. My documentation of the Fernery will allow future Fernery workers to see what worked (and what died) in this period of experimentation following the Fernery restoration. I hope that my digital photographs will be used for brochures and placed on the Internet to spread knowledge of ferns to the public. The Morris Arboretum contains a very notable fern collection, and I hope my work will allow these fascinating plants to be more fully appreciated.

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Last but not least, thank you to Reggie and Tom Whitehead for their expert fern identifications.

APPENDIX A. HARDY FERNS PRESENT AT MORRIS ARBORETUM, BY SPECIES

Latin Name	Common Name	Locations
<i>Adiantum pedatum</i>	northern maidenhair fern	Hardy fern walk, Metasequoia grove, Native Azaleas
<i>Arachniodes standishii</i>	upside-down fern	Log cabin
<i>Athyrium filix-femina</i>	lady fern	Stream near springhouse, Widener Woods (uphill), Overlook garden, Metasequoia grove, Swan Pond area, and Carriage path
<i>A. filix-femina</i> ‘Frizelliae’	tatting fern	Overlook garden
<i>A. filix-femina</i> ‘Lady in Red’	lady in red fern	Overlook garden, Hillcrest driveway
<i>Athyrium niponicum</i> ‘Pictum’	Japanese painted fern	Hardy fern walk, Japanese garden, Widener Woods (uphill), Rose garden, Orange Balustrade
<i>Cheilanthes austrotenuifolia</i>	rock fern	Widener Woods (uphill), Mercury Ravine
<i>Cheilanthes argentea</i>	silver cloak fern	Overlook garden
<i>Cheilanthes lanosa</i>	hairy lip fern	Widener Woods (uphill)
<i>Cyrtomium macrophyllum</i>	large-leaf holly fern	Under <i>Acer</i> by greenhouse
<i>Cystopteris bulbifera</i>	berry bladder fern	Widener Woods (uphill)
<i>Dryopteris borreri</i> ‘Crispa’	scaly male fern	Hardy fern walk
<i>Dryopteris carthusiana</i> (= <i>D. spinulosa</i>)	narrow buckler fern/wood fern	Hardy fern walk, Widener Woods, under <i>Acer</i> by greenhouse, Hill and Cloud garden, Stream near springhouse, Log cabin

<i>Dryopteris celsa</i>	log fern	Log cabin, Widener Woods (uphill)
<i>Dryopteris dilatata</i> ‘Jimmy Dyce’	broad buckler fern	Widener Woods (uphill)
<i>Dryopteris filix-mas</i>	male fern	Log cabin, Rose garden, Holly slope (near Studio), Mercury Ravine
<i>D. filix-mas</i> (‘Cristata’ group)	crested male fern	Stream in English Park, Keyhole Fountain
<i>D. filix-mas</i> ‘Undulata Robusta’	robust male fern	Hardy fern walk
<i>Dryopteris goldiana</i>	Goldie’s fern/giant wood fern	Widener Woods (uphill)
<i>Dryopteris marginalis</i>	marginal shield fern	Hardy fern walk, Widener Woods
<i>Dryopteris</i> (no sori present)		Inside train exhibit, Wetlands
<i>Matteuccia struthiopteris</i>	ostrich fern	Greenhouse parking lot, Restroom near greenhouse, Outside train exhibit, Hill and Cloud garden, Holly slope, Gates Hall, Orange Balustrade, near champion Katsura, Log cabin, Swan Pond area, Hillcrest driveway, Mercury Ravine, Native Azaleas, Widener Woods (downhill)
<i>Onoclea sensibilis</i>	sensitive fern	Hill and Cloud garden, Holly slope, Gates Hall, Overlook Garden, Swan Pond area, Hillcrest driveway, Carriage path, Mercury Ravine, Wetlands
<i>Oreopteris limbosperma</i> (alt. <i>Dryopteris oreopteris</i> or <i>Thelypteris limbosperma</i>)	mountain fern	Widener Woods (uphill)
<i>Osmunda cinnamomea</i>	cinnamon fern	Metasequoia grove, Widener Woods (uphill)
<i>Osmunda claytoniana</i>	interrupted fern	Hardy fern walk

<i>Osmunda regalis</i>	royal fern	Metasequoia grove, Swan Pond area, Widener Woods (uphill)
<i>Phegopteris connectilis</i> (alt. <i>Thelypteris phegopteris</i>)	beech fern	Log cabin
<i>Phegopteris hexagonoptera</i> (alt. <i>Thelypteris hexagonoptera</i>)	southern beech fern	Widener Woods (uphill)
<i>Polypodium virginianum</i>	American wall fern/ Virginia polypody	Log cabin
<i>Polystichum acrostichoides</i>	Christmas fern	Hardy fern walk, Orange Balustrade, Log cabin, Overlook Garden, Mercury Ravine, Native Azaleas, Widener Woods
<i>Polystichum neolobatum</i>	long-eared holly fern	Under <i>Acer</i> by greenhouse
<i>Polystichum polyblepharum</i>	tassel fern	Inside train exhibit
<i>Thelypteris decursive-pinnata</i> (alt. <i>Phegopteris decursive-pinnata</i>)	Japanese beech fern	Overlook garden

APPENDIX B. Hardy Ferns Present at Morris Arboretum, by Location

Location	Label? Species present	Notes
Greenhouse parking lot	X=yes; (X)=hand-written or old label	
	Matteuccia struthiopteris	
Restroom near Greenhouse		
	Matteuccia struthiopteris	
Under Acer by Greenhouse	X	Cyrtomium macrophyllum
		Dryopteris carthusiana
	X	Polystichum neolobatum
Hardy fern walk	X	Adiantum pedatum
	X	Athyrium filix-femina
		'Cristatum'
		(this is printed on tag, but fern may no longer be there)
		A. niponicum 'Pictum'
		(misspelled as
		"nipponicum" on all tags)
	X	Dryopteris borreri 'Crispa'
	X	D. carthusiana
	X	D. filix-mas 'Undulata
		Robusta'
	X	D. marginalis
	X	Osmunda claytoniana
	X	Polystichum acrostichoides
Rose garden	X	Athyrium niponicum
		'Pictum'
		Dryopteris filix-mas
Outside train exhibit		
		Matteuccia struthiopteris
Inside train exhibit		
		Dryopteris sp. (no sori present)
	X	Polystichum polyblepharum
Hill and Cloud garden		
		Athyrium niponicum
		'Pictum'
		Dryopteris carthusiana

		Matteuccia struthiopteris Onoclea sensibilis	
Holly slope		Dryopteris filix-mas Matteuccia struthiopteris Onoclea sensibilis	near studio lower upper
Stream, near springhouse		Dryopteris carthusiana	
Gates Hall		Matteuccia struthiopteris Onoclea sensibilis	front left side
Orange Balustrade		Athyrium niponicum 'Pictum' Matteuccia struthiopteris Polystichum acrostichoides	
Near champion Katsura		Matteuccia struthiopteris	
Log cabin	X	Arachniodes standishii Dryopteris carthusiana D. celsa	
	X	D. filix-mas D. marginalis Matteuccia struthiopteris Onoclea sensibilis Phegopteris connectilis (alt. Thelypteris phegopteris) Polypodium virginianum	
	X	Polystichum acrostichoides	
Stream, English Park		Dryopteris filix-mas (<i>'Cristata'</i> group)	crested
Overlook Garden		Athyrium filix-femina A. filix-femina <i>'Frizelliae'</i> A. filix-femina <i>'Lady in Red'</i> Cheilanthes argentea Onoclea sensibilis	

		Polystichum acrostichoides Thelypteris decursive- pinnata	
Keyhole fountain		Dryopteris filix-mas (‘Cristata’ group)	crested
Metasequoia grove		Adiantum pedatum Athyrium filix-femina Osmunda cinnamomea O. regalis	
Swan Pond area		Athyrium filix-femina Matteuccia struthiopteris Onoclea sensibilis Osmunda regalis	
Hillcrest driveway		Athyrium filix-femina ‘Lady in Red’ Matteuccia struthiopteris Onoclea sensibilis	
Carriage path		Athyrium filix-femina Onoclea sensibilis	
Mercury Ravine		Cheilanthes austrotenuifolia Dryopteris filix-mas Matteuccia struthiopteris Onoclea sensibilis Polystichum acrostichoides	
Native Azaleas	X	Adiantum pedatum Matteuccia struthiopteris Polystichum acrostichoides	
Widener Woods (uphill)	X	Athyrium filix-femina A. niponicum ‘Pictum’ Cheilanthes lanosa Cheilanthes austrotenuifolia (verify)	
	(X)	Cystopteris bulbifera	

- Dryopteris celsa
- (X) D. carthusiana (hand-written label says D. spinulosa)
- X D. dilatata 'Jimmy Dyce'
- D. goldiana
- D. marginalis
- Oreopteris limbosperma
(alt. Dryopteris oreopteris or Thelypteris limbosperma)
- Osmunda cinnamomea
- O. regalis
- Phegopteris hexagonoptera
(alt. Thelypteris hexagonoptera)
- Polystichum acrostichoides

Widener Woods (downhill)

- Dryopteris carthusiana
- D. marginalis
- Matteuccia struthiopteris
- Polystichum acrostichoides

Wetlands

- Dryopteris (too immature to ID)
- Onoclea sensibilis

APPENDIX C. RECOMMENDED FERNS FOR THE MORRIS ARBORETUM

[N.B. A cultivar is listed as “(native)” if the straight species is native to southeastern Pennsylvania.]

Bold letter codes refer to suppliers. Please see below for supplier information.

Photos and Information Available on Hardy Ferns CD-ROM

			<u>Suppliers</u>
<i>Asplenium platyneuron</i>	ebony spleenwort	native	DT
<i>Asplenium</i> (syn. <i>Phyllitis</i>) <i>scolopendrium</i>	hart’s-tongue fern		TL
<i>Cyrtomium falcatum</i>	Japanese holly fern		CF
<i>Cyrtomium fortunei</i>	Japanese holly fern		CF
<i>Dryopteris erythrosora</i>	autumn fern		RL
<i>Dryopteris filix-mas</i> ‘Barnesii’	Barnes’s narrow male fern	(native)	CF
<i>Dryopteris filix-mas</i> ‘Grandiceps’	grandiceps male fern	(native)	CF
<i>Polystichum munitum</i>	western sword fern		CF
<i>Polystichum setiferum</i>	soft shield fern		CN
<i>Polystichum setiferum</i> ‘Herrenhausen’	soft shield fern		FT
(<i>Woodwardia areolata</i>	netted chain fern	native	FT)

[*Woodwardia areolata* is listed as endangered in PA and cannot be planted at this time.]

The above ferns were recommended by Charles Cresson, Shelley Dillard, and Jeff Jabco at: Ferns for Delaware Valley Gardens – A Workshop, Scott Arboretum, 15 August 2002

Other Recommended Species Hardy for Zone 6

		<u>Suppliers</u>
<i>Adiantum pedatum</i> 'Aleuticum'	serpentine maidenhair fern (native)	CF
<i>Adiantum pedatum</i> 'Miss Sharples'	Miss Sharples maidenhair (native)	FT
<i>Asplenium scolopendrium</i> 'Angustifolia'	cut-leaved hart's-tongue	DO
<i>Asplenium scolopendrium</i> 'Cristata'	crested hart's-tongue	DO
<i>Asplenium trichomanes</i>	maidenhair spleenwort native	FT
<i>Asplenium trichomanes</i> 'Cristatum'	crested maidenhair spleenwort (native)	FT
<i>Athyrium filix-femina</i> 'Veroniae Cristatum'	crested lady fern (native)	CF
<i>Athyrium filix-femina</i> 'Victoriae'	Victoria lady fern (native)	CF
<i>Athyrium niponicum</i> 'Metallicum'	Japanese painted fern	BC
<i>Athyrium otophorum</i> 'Okanum'	auriculate lady fern	CF,SS
<i>Athyrium vidalii</i>	black crozier lady fern/Vidal's lady fern	CF
<i>Athyrium</i> x 'Branford Beauty'	Branford Beauty fern	CF
<i>Athyrium</i> x 'Branford Rambler'	Branford Rambler fern	CF
<i>Athyrium</i> x 'Ghost'	ghost fern	CF
<i>Blechnum penna-marina</i>	alpine water fern	DT,FT
<i>Cyrtomium fortunei</i> 'Clivicola'	Japanese holly fern	FT
<i>Cystopteris fragilis</i>	brittle bladder fern native	FT
<i>Deparia pycnosora</i>		CF
<i>Dryopteris affinis</i>	scaly male fern/golden scale fern	FT,GW
<i>Dryopteris affinis</i> 'Pinderi'	scaly male fern cv.	FT
<i>Dryopteris affinis</i> 'Polydactyla Dadds'	scaly male fern cv.	FT
<i>Dryopteris championii</i>	Champion's wood fern	CF
<i>Dryopteris crassirhizoma</i> = <i>D. buschiana</i>	thick-stemmed wood fern	FT
<i>Dryopteris cycadina</i> = <i>D. atrata</i>	shaggy shield fern	RL
<i>Dryopteris dilatata</i>	broad buckler fern	FT
<i>Dryopteris dilatata</i> 'Crispa Whiteside'	Whiteside's broad buckler	FT
<i>Dryopteris dilatata</i> 'Lepidota Cristata'	beautiful broad buckler	FT
<i>Dryopteris dilatata</i> 'Recurved Form'	recurved broad buckler	CF
<i>Dryopteris cristata</i>	buckler fern native	FF
<i>Dryopteris erythrosora</i> 'Brilliance'	Brilliance autumn fern	CF

<i>Dryopteris erythrosora</i> ‘Prolifica’	dwarf autumn fern		CF
<i>Dryopteris filix-mas</i> ‘Linearis Polydactilon’	many-fingered male fern	(native)	FT
<i>Dryopteris intermedia</i>	<i>fancy fern</i>		CF
<i>Dryopteris lacera</i>	<i>leathery wood fern</i>		CF
<i>Dryopteris pycnopteroides</i>	<i>Japanese wood fern</i>		CF
<i>Dryopteris sieboldii</i> (marginally hardy)	Siebold’s wood fern		CF
<i>Dryopteris tokyoensis</i>	Tokyo wood fern		CF
<i>Dryopteris wallichiana</i>	Wallich’s wood fern		CF
<i>Dryopteris x australis</i>	Dixie wood fern		CF
<i>Matteuccia orientalis</i>	oriental ostrich fern		SS
<i>Osmunda regalis</i> ‘Cristata’	crested royal fern	(native)	SS
<i>Osmunda regalis</i> ‘Purpurescens’	purple royal fern	(native)	CF,SS
<i>Polypodium interjectum</i>	western polypody		SS
<i>Polypodium vulgare</i> ‘Bifidum Multifidum’	crested common polypody		SS
<i>Polystichum aculeatum</i>	hard shield fern		CF
<i>Polystichum braunii</i>	Braun’s holly fern	native	CF
<i>Polystichum makinoi</i>	Makino’s holly fern		CF
<i>Polystichum rigens</i>	rigid sword fern		CF
<i>Polystichum setiferum</i> ‘Congestum’	congested soft shield fern		FT
<i>Polystichum setiferum</i> ‘Plumosum’	soft shield fern cv.		FT
<i>Polystichum setiferum</i> ‘Plumosum Densum’	mossy soft shield fern		FT
<i>Polystichum setiferum</i> ‘Proliferum’	soft shield fern cv.		FT
<i>Polystichum setiferum</i> ‘Proliferum Wallastonii’	soft shield fern cv.		FT
<i>Polystichum tsus-simense</i>	Korean rock fern		CF,CN
<i>Selaginella uncinata</i> (marginally hardy)	peacock spikemoss		CF
<i>Thelypteris palustris</i>	marsh fern	native	CF, SS
<i>Woodsia obtusa</i>	blunt-lobed woodsia	native	FT

Recommended at http://www.ferns.com/html_uk/zone_html/zone_06.html and at www.casaflora.com.

HARDY FERNS NOT YET AVAILABLE FOR PURCHASE IN NORTH AMERICA – keep checking!

<i>Adiantum pedatum</i> ‘Imbricatum’	maidenhair fern	(native)
<i>Adiantum pedatum</i> ‘Japonicum’	rosy maidenhair fern	(native)
<i>Asplenium scolopendrium</i> ‘Furcata’	hart’s-tongue cv.	
<i>Asplenium scolopendrium</i> ‘Undulata’	undulating hart’s-tongue	
<i>Athyrium filix-femina</i> ‘Rotstiel’	redsteel lady fern	(native)
<i>Dryopteris affinis</i> ‘Angustata Crispata’	cristate golden scale fern	
<i>Dryopteris affinis</i> ‘Crispa Congesta’	congested golden scale fern	
<i>Gymnocarpium dryopteris</i> ‘Plumosum’	plumose oak fern	(native)
<i>Polystichum setiferum</i> ‘Dahlem’	soft shield fern cv.	
<i>Woodsia ilvensis</i>	rusty woodsia	native

RECOMMENDED FERNS FOR THE DORRANCE H. HAMILTON FERNERY

<i>Adiantum capillus-veneris</i>	Southern maidenhair fern	CF
<i>Blechnum spicant</i>	deer fern	CF
<i>Cheilanthes sinuata</i> (syn. <i>Notholaena sinuata</i>)	wavy cloak fern	CF
<i>Nephrolepis pendula</i>	Long John pendulant fern	CF
<i>Selaginella kraussiana</i> ‘Brownii’	pin-cushion spikemoss	CF
<i>Thelypteris kunthii</i>	Southern wood (river) fern	CF

FERN SUPPLIERS

BC Botanus.com
B.C., Canada

CF Casa Flora, Inc.
Dallas, TX
800-233-3376
<http://casaflo.com>

CN Clarks Nursery
Fallbrook, CA
760-723-9568
sales@clarknursery.com

DO Dancing Oaks Nursery
Monmouth, OR
503-838-6058
<http://www.dancing-oaks.com>

DT D & T Wholesale Nursery
Altamont, TN
866-526-4527
<http://www.dntnursery.com>

FF Fiddley Frond's Nursery
Norridgewock, ME
207-634-4918
<http://www.angelfire.com/biz/fiddleyfrondsnsy/index.html>

FT Fraser's Thimble Farms
B.C., Canada
Fax 250-537-5788
<http://www.thimblefarms.com/98ferntf.html>

GW Greenworks Nursery
Highlandville, MO
417-443-6300
wholesalenursery@aol.com

RL Royal Lane Nursery, Inc.
Fruitvale, TX
903-896-4485
<http://royallanenursery.com>

SS Sunshine Farm and Gardens
Renick, WV
304-497-2208
barry@sunfarm.com

TL T & L Nursery
Redmond, WA
425-885-5050
<http://www.tandlnursery.com>

APPENDIX E. REQUEST LIST FOR FERNERY LABELS

# of Labels Name	Latin Name	Common
1 fern	<i>Adiantum peruvianum</i>	silver dollar
1 Roseum maidenhair fern	<i>Adiantum tenerum</i> ‘Gloriosum Roseum’	Gloriosum
1 fern	<i>Aglaomorpha meyeniana</i>	bear’s-paw
1 spleenwort fern	<i>Asplenium bulbiferum</i>	mother
2 fern	<i>Asplenium nidus</i>	bird’s-nest
1 fern	<i>Blechnum brasiliense</i>	Brazilian tree
2	<i>Blechnum gibbum</i>	dwarf tree fern
1 Central Am. strap fern	<i>Campyloneurum angustifolium</i> ‘Twisted Strap’	Twisted Strap
1 fern	<i>Cibotium schiedeii</i>	Mexican tree
2 fern	<i>Cyathea cooperi</i>	Australian tree
1 Japanese holly fern	<i>Cyrtomium falcatum</i> ‘Rochfordianum’	Rochford’s
1 fern	<i>Davallia fejeensis</i> ‘Major’	hare’s-foot
1 tree fern	<i>Dicksonia antarctica</i>	Tasmanian
1 fern	<i>Didymochlaena truncatula</i>	mahogany
1	<i>Drynaria sparsisora</i>	polypody
1 Gracilis male fern	<i>Dryopteris affinis</i> ‘Crispa Gracilis’	Crispa
1	<i>Dryopteris sieboldii</i>	wood fern
1 polypody	<i>Goniophlebium subauriculatum</i> ‘Knightiae’	Knight’s
1 fern	<i>Hemionitis arifolia</i>	strawberry
1 foot fern	<i>Humata tyermanii</i>	silver hare’s-

1 name)	<i>Microsorium musifolium</i>	(no common
1	<i>Microsorium punctatum</i>	polypody
2 polypody	<i>Microsorium punctatum</i> ‘Grandiceps’	crested
1 polypody	<i>Microsorium punctatum</i> ‘Grandiceps Dwarf’	dwarf crested
1 fern	<i>Nephrolepis exaltata</i> ‘Fluffy Ruffles’	Fluffy Ruffles
1 golden polypody	<i>Phlebodium aureum</i> ‘Mandaianum’	curly-leaved
1 fern	<i>Phlebodium decumanum</i>	lion’s-paw
1 polypody	<i>Phymatosorus scolopendria</i>	East Indian
1	<i>Pityrogramma calomelanos</i>	golden fern
1	<i>Platycerium veitchii</i> cross	staghorn fern
1 polypody	<i>Polypodium</i> ‘Green Wave’	Green Wave
1 holly fern	<i>Polystichum tsus-simense</i>	Tsus-sima
1 cretan brake fern	<i>Pteris cretica</i> ‘Albo-lineata’	variegated
1 fern	<i>Pteris cretica</i> ‘Childsii’	Child’s brake
1 slender brake fern	<i>Pteris ensiformis</i> ‘Victoriae’	Victorian
1 Japanese felt fern	<i>Pyrrosia lingua</i>	tongue fern or
1 Japanese felt fern	<i>Pyrrosia lingua</i> ‘Monstrifera’	Monstrifera
1 Japanese felt fern	<i>Pyrrosia lingua</i> ‘Nokogiri-ba’	Nokogiri-ba
1 Japanese felt fern	<i>Pyrrosia lingua</i> ‘Obake’	Obake
1	<i>Quercifilix zeylanica</i>	oak leaf fern
1 fern	<i>Rumohra adiantiformis</i>	leathery shield
1 Hawaiian tree fern	<i>Sadleria cyatheoides</i> ‘Ama U’	Ama U fern or
1 caterpillar fern	<i>Scyphularia pentaphylla</i>	black

1	<i>Selaginella erythropus</i>	spikemoss
1	<i>Selaginella victoriae</i>	spikemoss
1 fern	<i>Todea barbara</i>	Austral king

APPENDIX F. FERNERY SPECIES PRESENT, 1997-1998

(Photos are identified roughly top to bottom, left to right)

Photo 1

Phlebodium decumanum
Microsorium punctatum 'Grandiceps'
Aglaomorpha 'Roberts'
Humata tyermanii
Adiantum
Adiantum peruvianum
Adiantum
Goniophlebium subauriculatum 'Knightiae'
Microsorium musifolium
Pteris cretica 'Albo-lineata'
Drynaria sparsisora
Asplenium nidus
?
Diplazium lanceum
Cyathea cooperi (3)
Didymochlaena truncatula
Asplenium nidus
Microsorium punctatum 'Grandiceps'
Campyloneurum angustifolium 'Twisted Strap'

Photo 2

Pyrrosia lingua
Nephrolepis cordifolia 'Duffii'
Sadleria cyatheoides 'Ama U'
Blechnum gibbum (2)
Selaginella
Todea barbara

Photo 3

Didymochlaena truncatula
Nephrolepis
Adiantum .
Doodia blechnoides? or *Blechnum glandulosum?*
Pteris vittata
Nephrolepis
Tectaria gemmifera
Lastreopsis?
Campyloneurum angustifolium 'Twisted Strap'
?
Cyrtomium falcatum 'Rochfordianum'
Pteris?

Photo 4

Cyathea cooperi
Davallia (basket)
Phymatosorus scolopendrium
Woodwardia orientalis
Pyrrosia lingua 'Monstrifera'
Blechnum brasiliense
Davallia?
Diplazium esculentum?
Nephrolepis falcata forma *furcans*
Phlebodium aureum
Pyrrosia longifolia (basket)
Phlebodium aureum
Blechnum gibbum
?
Polystichum setiferum (cv.?)
Scyphularia pentaphylla
Selaginella
Asplenium nidus
Lygodium flexuosum
Pyrrosia lingua 'Nokogiri-ba'
Aglaomorpha
Phlebodium aureum
Phlebodium aureum 'Mandaianum'
Selaginella hermannii
Hemionitis arifolia
Cibotium scheidei
Pyrrosia lingua 'Obake'
Davallia

Photo 5

Cyathea cooperi (3)
Diplazium subsinuatum
Polystichum setiferum
Adiantum.
Adiantum
Dicksonia antarctica
Microsorium punctatum 'Grandiceps'
Microlepia?
Pellaea rotundifolia
Polystichum tsus-simense

Photo 6

Cyathea cooperi

Adiantum

Adiantum peruvianum

Aglaomorpha 'Roberts'

Pteris?

Adiantum

Ruhmora adiantiformis?

Goniophlebium subauriculatum 'Knightiae'

Adiantum peruvianum

Photo 7

Phlebodium aureum

Didymochlaena truncatula

Polystichum

Arachniodes simplicior 'Variegata'

Adiantum raddianum 'Pacific Maid'

Polystichum setiferum

?

Doryopteris pedata var. palmata

Platynerium veitchii cross

Phymatosorus scolopendria

Polystichum

?

Phlebodium decumanum

Microsorium punctatum 'Grandiceps'

Aglaomorpha 'Roberts'

Humata tyermanii

Adiantum peruvianum

Adiantum.

Photo 8

Cyrtomium falcatum 'Rochfordianum'

?

Woodwardia orientalis

?

?

Photo 9

Dicksonia antarctica

?

?

Microsorium punctatum 'Grandiceps'

?

Pellaea rotundifolia

Polystichum tsus-simense

Asplenium scolopendrium

Blechnum glandulosum

Pteris.

Pyrrosia lingua

Nephrolepis cordifolia 'Duffii'

Photo 10

Diplazium subsinuatatum

Leptochilus macrophyllus var. *wrightii*

Adiantum