

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE

RR
Pine Ranges
Burgess Spring

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THE VEGETATION TYPE MAP
Burgess Spring Experimental Range
1936

Report on
Field Methods and Progress

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THE VEGETATION TYPE MAP
Burgess Spring Experimental Range

Pasture I of the Burgess Spring Experimental Range is divided into about 836 square "blocks", each of these being two and one half chains on a side. This means that the area of each block is about $5/8$ of an acre. Using these blocks as working units, field work on a type map was begun in June, but mostly completed in September. The work consisted of excluding all tree species except Cercocarpus ledifolius from the picture, and listing each remaining species that could be found at any point on the block. All species were listed as either "conspicuous" or "inconspicuous." No particular density was borne in mind as a yardstick for throwing a species either way. Rather their appearance as "dominants" or "codominants" on any one block (trees excluded) was used as the criterion for inclusion with "conspicuous" species. It is possible with a given density, therefore, to have a species listed as "conspicuous" on a sparsely vegetated block, and appear as "inconspicuous" on a fairly densely vegetated block, simply because it appeared as a "dominant" in the first instance, but could not even be rated as a "codominant" in the second instance. In addition to the above division, "conspicuous" species were listed in descending order of their abundance on every block. Other things being equal, this ranking was based on the estimated density of the species concerned, but the bulk of material produced by the top of the plant is also considered in borderline cases. For example, under "conspicuous" species, Ceanothus prostratus might at times be listed after Wyethia mollis, even, though it may actually occupy a slightly greater part of the area, this arrangement being justified because of the difference in height growth of the two species.

There was, of course, an appreciable difference in the general appearance

of the vegetation between June and September. Some species, especially annuals, that appeared as "conspicuous" in June were almost if not completely "gone" in September. Accordingly, those blocks worked early in the season were checked at the end of the work insofar as "conspicuous" species were concerned, and changes made in those instances where a species no longer occupied its former "conspicuous" position. The completed data for the type map are therefore based on the appearance of the vegetation near the close of the grazing season. An attempt was made to list the "conspicuous" species according to the position they would have occupied if they had remained ungrazed.

Since there is a distinct tendency for some species to pass out of the picture as the season progresses, it only follows that for the distribution of such species, the type map data will prove inadequate. Some such species may have been missed altogether, while others will appear only occasionally, even though they may actually occur quite generally over the pasture. These species are relatively unimportant as forage plants, and the data should stand up well for all of the more important species. In Table B (which lists all species to be found in the type map data), after each species recorded appears, in the column headed "Data on plant", the words "Good", "Fair" or "Poor." Those species for which the data are designated "good" are thought to be well over 90 percent correct with respect to the type map data when compared with their actual occurrence. Species that are thought to be checked as present from roughly 75 to 90 percent of the time that they might actually be found on the various blocks are designated "fair." And species for which the data are thought to be less reliable than this are designated "poor."

The type map data have been checked against ^{all} available data except the

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L. R. Short
Oct. 7, 1936

Table A

Vegetation Type Map
List of Conspicuous Species on the B.S.E.R. ¹¹

	Plant Species	Plant Symbol	Remarks
✓	x 1. <i>Amelanchier alnifolia</i>	AMa	
✓	2. <i>Arctostaphylos patula</i>	Ap	
✓	3. <i>Artemisia arbuscula</i>	ARa	
✓	4. <i>Artemisia tridentata</i>	ARt	
	5. <i>Balsamorhiza sagittata</i>	BA s	Conspicuous but once
✓	x 6. <i>Bromus marginatus</i>	<u>Bm</u>	
✓	7. <i>Bromus tectorum</i>	<u>Bt</u>	
✓	8. <i>Ceanothus prostratus</i>	Cp	
✓	9. <i>Cercocarpus ledifolius</i>	CEl	Conspicuous but once
✓	10. <i>Chrysothamnus bloomeri</i>	CRYb	
✓	11. <i>Cirsium spp</i> (tall)	CI	
✓	x 12. <i>Festuca idahoensis</i>	<u>Fu</u>	
	13. <i>Gnaphalium</i> No. S-475	GN ^(S-) ₍₄₇₅₎	Probably <i>Antennaria</i> sp.
✓	x 14. <i>Lupinus</i> sp.	L	
	15. <i>Madia</i> sp.	MA	
✓	16. <i>Poa sandbergii</i>	<u>Ps</u>	
✓	x 17. <i>Purshia tridentata</i>	<u>Pt</u>	
✓	x 18. <i>Sitanion hystrix</i>	<u>SIh</u>	
✓	19. <i>Stipa lemmoni</i>	<u>SL</u>	
✓	20. <i>Wyethia mollis</i>	Wm	

¹¹ Based on a survey of each 5/8 Acre Block of Land in Pasture I.

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Table B

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Vegetation Type Map
Inconspicuous Species on the B. S. E. R. -
(Summer - 1936)

	Plant Species	Symbol Used	Collection No. of Plant	Other symbols or names used	Data on plant	Remarks
			S-			
1	<i>Achillea millefolium</i>	AC	483		Good	
2	<i>Agoseris grandiflora</i>	AGg	436		Fair	
3	<i>Agoseris</i> No. S-361	AG(361)	361		Poor	
4	<i>Agropyron</i>	A			Fair	
5	<i>Agrostis exarata</i>	AGex	499		"	
6	<i>Allium</i> sp.	ALU	416		Poor	
7	<i>Amelanchier alnifolia</i>	AMa	349		Good	
8	<i>Antennaria</i> sp.	AN	386	386	Fair	
9	<i>Apocyanum androsaemifolium</i>	APa	492		"	
10	<i>Aquilegia formosa</i>	No. S-407	407		"	
11	<i>Arabis holboellii</i> var. <i>fendleri</i>	TD	354		Good	Probably 2 spp.; (narrow & wide pods)
12	<i>Arctostaphylos patula</i>	Ap	346		"	
13	<i>Artemisia arbuscula</i>	ARa	506		"	
14	<i>Artemisia tridentata</i>	ART	505		"	
15	<i>Artemisia vulgaris</i>	ARv			Fair	
16	<i>Aster</i> sp.	AST	350		"	} If separate species, possibly confused at times
17	<i>Aster integrifolius</i>	ASTi	498		"	
18	<i>Astragalus purshii</i>	ASps	402		Good	
19	<i>Astragalus</i> No. S-371	AS(371)	371	371	Poor	
20	<i>Balsamorhiza sagittata</i>	BAs	441		Fair	
21	<i>Brodiaea hyacinthina</i>	Bh	486	<i>Brodiaea</i> (white)	Poor	
22	<i>Bromus marginatus</i>	Bm	460		Good	
24	<i>Bromus tectorum</i>	Bt	409		"	
25	<i>Capsella bursa pastoris</i>	←	408	408	Fair	
26	<i>Carex</i> spp.	C(tall)	405	C(5-), C(4/11), C(5-)		Includes 2 or more spp.
27	<i>Carex rosea</i>	Cr	419		Good	
28	<i>Carrot</i>	←	348		Fair	
29	<i>Carum gairdneri</i>	←	449		"	
30	<i>Castilleja</i> sp.	CS	378		"	
31x	<i>Ceanothus prostratus</i>	Cp			Good	

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Vegetation Type Map — Inconspicuous Species (Cont.)

	Plant Species	Symbol Used	Collection No. of Plant	Other symbols or Names Used	Data on Plant	Remarks
			S—			
32-316	<i>Cercocarpus ledifolius</i>	CEL	507	✓	Good	
33-32	<i>Chaenactis douglasii</i>	CHd	480	✓ No. 10; PH-10	"	
34-33	<i>Chrysothamnus bloomervi</i>	CRYb	497	✓	Good	
35-34	<i>Chrysothamnus nauseatus</i>	CRYn	494	✓	"	
36-35	<i>Chrysothamnus</i> No. S-495	CRY(355)	495	✓ 495	"	
36-37	<i>Chrysothamnus</i> No. S-502	CRY(502)	502	✓ 502	Fair	} Possibly the same sp.
37-38	<i>Chrysothamnus</i> No. S-503	CRY(503)	503	✓ 503	"	
38-39	<i>Chrysothamnus</i> No. S-504	CRY(504)	504	✓ 504	"	
39-40	<i>Cirsium</i> spp.	CI	479	✓ CI (white); CI (pink)	Good	
40	<i>Cirsium</i> sp.	CI (low)	489	✓	Fair	
41	<i>Clarkia rhomboidea</i>	Chr	358	✓ 358	"	
42	<i>Collinsia parviflora</i>	COp	344	✓	Good	
43	<i>Collinsia</i> No. S-455	CO(355)	455	✓	Poor	
44	<i>Collomia grandiflora</i>	COLg	362	✓ 362;	Fair	
45	<i>Collomia</i> No. S-382	382	382	✓	Poor	
46	<i>Convolvulus atriplicifolius</i>	CV	469	✓ CVat	Fair	
47	<i>Crepis acuminata</i>	CREa	509	✓	Good	Possibly at times confused with CREo
48	<i>Crepis monticola</i>	CREm	444	✓	Poor	
49	<i>Crepis occidentalis</i>	CREo	476	✓	Fair	Possibly at times confused with CREa
50	<i>Cryptantha affinis</i>	CRA	389	✓ CR(364); CR(381); 426 (CR(326); CR; 364)	Fair	Probably but one species
51	<i>Danthonia unispicata</i>	DW	398		Poor	Possibly more than one sp.
52	<i>Delphinium menziesii</i>	Dm	347		"	
53	<i>Dodecatheon conjugens</i>	Dodecatheon	331		"	
54	<i>Elymus (glaucus?)</i>	E	470		Fair	
55	<i>Elymus (triticoideus?)</i>	E (t?)			Poor	
56	<i>Epilobium paniculatum</i>	EPp	493		Fair	
57	<i>Erigeron inornatus</i>	397	397		"	
58	<i>Eriogonum (nudum?)</i>	EGn	474	413	Good	

Check successive numbers to see whether they are the same or different.

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Vegetation Type Map - Inconspicuous Species (Cont.)

	Plant Species	Symbol Used	Collection No. of Plant	Other symbols or Names Used	Data on Plant	Remarks
59 ^a	<i>Eriogonum spargulinum</i>	EGsg	375		Fair	
60	<i>Eriogonum umbellatum?</i>	EGu	432		"	
61	<i>Eriophyllum</i> sp.	EY	459		Good	Probably 2 spp.
62	<i>Festuca idahoensis</i>	Fu			Good	
63	<i>Fritillaria</i> spp.	FT			Poor	Probably 2 spp.
64	<i>Galium aparine?</i>	GM	367	GM(567); 367	Poor	
65	<i>Galium</i> (?)	368	368		"	
66	<i>Geranium incisum</i>	GEu	433		Fair	
67	<i>Geum triflorum</i>	GEUt	423	423	Good	
68	<i>Gilia aggregata</i>	Gla	412	412	Fair	
69	<i>Gilia leptalea</i>	Gleptalea	472	<i>Gilia leptalea</i>	"	
70	<i>Gnaphalium</i> No. S-414	GN(414)	414		"	
71	<i>Gnaphalium</i> No. S-475	GN(475)	475 → 452		"	Probably <i>Antennaria</i> sp.
72	<i>Gayophytum</i> sp. (spp.?)	GO	477	(GO(large); GO(pink); GO(slender) 491)	"	
73	<i>Hieracium albiflorum</i>	HC	411	411	Fair	
74	<i>Hydrophyllum capitatum</i>	HYc	333		Poor	
75	<i>Juncus</i> (?)	Juncus	418	418; <i>Juncus</i> (?)	Fair	Probably 2 spp.
76	<i>Kellogia galoides</i>	Kg	379	379	Fair	
77	<i>Koeleria cristata</i>	Kc	373		"	to here

Vegetation Type Map - Inconspicuous Species (Cont.)

	Plant Species	Symbol Used	Collection No. of Plant	Other symbols or Names Used	Data on Plant	Remarks
78	Lactuca (?)	No. (S-500)	5-		Poor	Rare; not collected
79	Lappula californica	←	458		"	Rare
80	Leptodactylon pungens	LEDp	332		Fair	
81	Linanthus sp.	LI			Poor	
82	Linum lewisii	LNl	385		Fair	
83	Linum like	←			Poor	Rare; Not collected
84	Lithophragma sp.	LH	336, 337		"	
85	Lomatium (?)	LOM	400		"	
86	Lotus (americanus?)	LOa	447	Lotus a.	Fair	
87	Lupinus	L	471		Good	
88	Madia (glomerata?)	MA	457		Fair	
89	Melica	M			Poor	Rare; possibly something else.
90	Mentzelia	MZ		383	"	
91	Mimulus No. S-417 (yellow)	MM(317)	417		"	
92	Mimulus No. S-446	MM(pink)	446	446	"	
93	Monardella sp.	M	467		Good	
94	Montia (perfoliata?)	MTp	359		Poor	
95	Navarretia spp.	[S-473] Navarretia	374, 473, 393		Fair	Possibly 2 spp.
96	Nemophilla sp.	N. (N)	404, 404	(N(393); N(404))	Poor	" " "
97	Orthocarpus No. S-394	OR(394)	394		Poor	(yellow)
98	Orthocarpus (?) No. S-453	453	453		Fair	(purple)
99	Osmorhiza occidentalis	OZo	403	8	"	

Vegetation Type Map - Inconspicuous Species (Cont.)

	Plant Species	Symbol/Used	Collection No. of Plant	Other symbols or Names Used	Data on Plant	Remarks
			S-			
100	Paeonia brownii	PAEb			Poor	
101	Pedicularis	PU	410	No. S-410	"	
102	Pentstemon No. S-357	PE(357)	357		Fair	
103	Pentstemon (Not S-357)	PE(Not S-357)		357	"	
104	Phacelia heterophylla	PHh	{463, 478}	PH(Large)	"	
105	Phacelia (humilis?)	PH(ann)	351		Poor	
106	Phlox gracilis	PHXg	{443, 463}		Good	No. S-463 = white
107	Poa nervosa	Pnr	{440, 441}		"	
108	Poa sandbergii	Ps			"	
109	Polygonum spp.	PG(ann)	<352, 351>	PG(351), 420	Fair	Probably 2 spp.
110	Potentilla glandulosa	PDg	428	PD(324)	Good	
111	Potentilla gracilis	PDgr	425	No. S-425	"	
112	Prunus sp. (spp?)	PR(narrow)		PR(small)	"	Possibly 2 spp.
113	Prunus sp.	PR(wide)	466		"	
114	Pterospora andromeda	No. S-488	488		Poor	
115	Purshia tridentata	Pt	482		Good	
116	Ranunculus occidentalis	RAw	338		Poor	
117	Ribes No. S-439	RI(339)	439		Good	(Smooth)
118	Ribes No. S-481	RI(481)	481		"	(With stickers)
119	Rosa	RO	484		"	
120	"Round Leaf"	←			Poor	
121	Rumex	RU	387	Rumex	Fair	
122	Sambucus	SB	490		Fair	
123	Scorzonella nutans	SZn	353		Poor	
124	Scorzonella No. S-360	SZ(360)		360	"	Wide leaf, whitish midrib
125	Scorzonella (?) No. S-372	SZ(372)	372	372	"	Possibly same sp. as above
126	Scutellaria nana	SC	445		"	
127	Senecio aronicoides (?)	SN	355		Good	
128	Silene sp.	Silene	487	Silene(357), 487	Fair	

Vegetation Type Map - Inconspicuous Species (Cont.)

	Plant Species	Symbol Used	Collection No. of Plant	Other symbols or Names Used	Data on Plant	Remarks
			S-			
129	Sisymbrium (pinnatum?)	SIS	435		Poor	
130	Sitanion hystrix	SIh	461 → 477		Good	
131	Smilacina	S-406			Fair	
132	Solidago californica	SODc	376	S-376	Poor	
133	Stachys veronicaefolia	SSv	485	SS; Stachys	Fair	
134	Stellaria jamesiana	STEj	438		"	
135	Stipa elmeri	Se	462		Good	→ Probably at times confused with Se
136	Stipa lemmoni	SL	401		"	
137	Stipa occidentalis	So	366		Good	→ Probably at times confused with Se
138	Swertia	SW			Fair	
139	Symphoricarpos sp.	SY	468		Good	
140	Taraxacum vulgare	TAv	442	Taraxacum	Fair	
	Thelopodium	TD	(See Arabis holboellii)			
141	Trifolium cyathiferum	Tcy	391	T(391)	Fair	
142	Trifolium No. S-395	T(395)	395		Poor	
143	Trisetum	T	456		Fair	
144	Verbascum	Verbascum			Fair	
145	Viola beckwithii	Vb	328		Poor	
146	Viola nuttallii	Vn	334		"	
147	Viola praemorsa	Vp	345		"	
148	Wyethia mollis	Wm	440	6	Good	
149	Zygadenus paniculatus	Zp	434		Poor	

Vegetation Type Map - Inconspicuous Species (Cont)

		Plant Species	Symbol Used	Collection No. of Plant	Other Symbols or Names Used	Date on Plant	Remarks
	No.			5-			
150	6	(See Wyethia mollis)		7		Poor	Probably Wyethia seedling
151	7	(See Osmorrhiza occidentalis)		47		Poor	Possibly Agoseris sp.
152	49			49 450		Poor	
	No. 5-	(See Pentstemon No. 5-357)					
	358	(See Clarkia rhomboidea)					
	360	(See Scorzonella No. 5-360)					
	362	(See Collomia grandiflora)					
	364	(See Cryptantha)					
153	365			365		Poor	(Possibly Gayophytum or EP _p)
	367	(See Galium aparine)					
	368	(See Galium)					
154	369	(See Nemophylla)		369		Poor	
	370	(See No. 5-1422)					
	371	(See Astragalus No. 5-371)					
	372	(See Scorzonella No. 5-372)					
	376	(See Solidago californica)					
155	377			377		Poor	(Epilobium-like; small)
	379	(See Kelloggia galoides)					
156	380			380		Poor	Possibly Erigeron No. 5-397
	381	(See Cryptantha)					
	382	(See Collomia No. 5-382)					
	383	(See Mentzelia)					
	384	(See No. 5-399)					
	388						
157	396			396		Poor	Probably a Crucifer
	397	(See Erigeron inornatus)					
158	399			399 399	384	Fair	
	403	(See Osmorrhiza occidentalis)					
	406	(See Smilacina)					
	407	(See Aquiligia formosa)					
	408	(See Capsella bursa pastoris)					
	410	(See Pedicularis)					
	411	(See Hieracium albiflorum)					
	412	(See Gilia aggregata)					

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Vegetation Type Map - Inconspicuous Species (Cont.)

	Plant Species	Symbol Used	Collection No. of Plant	Other Symbols or Names Used	Data on Plant	Remarks
	No. S- 413 (See <i>Eriogonum nudum</i>)					
	418 (See <i>Juncus</i> ?)					
	419 (See <i>Carex</i> spp.)					
159	422 (See <i>Geum triflorum</i>)	No. S-422	422	370	Good	Tall Crucifer, erect pods
	423 (See <i>Potentilla gracilis</i>)					
	425 (See <i>Cryptantha</i>)					
160	427	427	427		Poor	(Aster-like)
161	431	431			Poor	(Aster-like)
162	451	451	451		Poor	(Small Aster like)
	453 (See <i>Orthocarpus</i>)	No. S-453	453			
163	454	454	454		Poor	(Possibly <i>Epilabium</i> sp.)
	488 (See <i>Pterospora andromeda</i>)					
164	496 (Compare with S-388)	496	496		Poor	(Yellow herbaceous Composite)
	500 (See <i>Lactuca</i>)					
	501 (See <i>Polygonum ann.</i>)					
	502 (See <i>Chrysothamnus</i>)	No. S-502	502			
	503 (See <i>Chrysothamnus</i>)	No. S-503	503			
165	510	510			Poor	(Umbellifer)
166	511	511			"	(Composite)
	550 (See No. 49)					
167	(16315)					

Table C

Vegetation Type Map - Summary of Conspicuous Species
B.S.E.R. - 1936

[illegible]

Table D

Vegetation Type Map — Summary of Inconspicuous Species
B.S.E.R. — 1936

[illegible]

species count on quadrats, to see that the type map corresponded with the other data in the case of the known distribution of some of the important species.

Plant species were listed almost entirely by the use of the plant symbols proposed by Hormay. The use of these symbols on this project saved a great deal of time, since a total of approximately 25,000 individual entries ~~was~~ made.

There were a number of species whose identity was not determined at the beginning of the work, some of which even yet remain as "unknowns." These species were handled by the use of collector's numbers. There are a few instances where a given species was designated by more than one symbol, number, or name. Table B shows the name to be used for all plant species recorded, and is arranged alphabetically. It also shows any other name, number, or symbol that may have been used for all species encountered, as well as the collection number of each species included in the herbarium collection.

Compilation of the Type Map

It will be noted, by referring to Table B, that there were 167 species encountered in assembling the data for the type map. This would seem to make a large task of compiling the data. However, it will in reality require less time than one might at first suspect. Compiling the "conspicuous" species, which are listed alphabetically in Table A, should be done quite independently from the "inconspicuous" species, shown in Table B.

Compiling the "conspicuous" species

The suggested form for compiling the "conspicuous" species is shown in Table C. The first column cares for the block number, which is here called "quadrat No." The second column, headed "No. of species", refers only to

"conspicuous" species, and expresses the number of these that are recorded about each quadrat. Its chief purpose is to serve as a quick method of checking the compilation to determine whether or not some entry has been omitted, but it may also be used to see at a glance how the number of dominants and codominants varies from block to block. The next 20 columns are given over to the 20 "conspicuous" species that are found in Pasture I. They are arranged in alphabetical order for simplicity of location on the part of the compiler. Symbols are used at the heads of these columns, the same as were used in the field work. It will be noted that instead of making a check under the proper species column and opposite the quadrat concerned to record in the summary the presence of a given "conspicuous" species, a number has been used. This number represents the position of the particular "conspicuous" species with reference to other species in this group on the quadrat. For example, the order of entries in the field for quadrat 1 is "SIh, Bm, and Cp", indicating that 'SIh' is most abundant, Bm next, and Cp least abundant of the conspicuous species. Accordingly, opposite quadrat 1 and in the SIh column a figure 1 is placed (instead of a check), a figure 2 in the Bm column, and a figure 3 in the Cp column. It takes almost no more time to apply this system of checking off the species than it would to make an ordinary check mark (✓), and the advantages are that one has a possible check against the omission of a species, and an added means of determining the positions of the various "conspicuous" species with respect to one another. Approximately 16 sheets of 14 x 17 inch compilation paper will be necessary to compile the complete list of "conspicuous" species.

It should be borne in mind that what was said about good, fair, and

poor data for the "inconspicuous" species does not apply to "conspicuous" species. Even though the records for Madia, Balsamorhiza, and Gnaphalium No. S-475 are only considered "fair" for "inconspicuous" species, they are "good" for these species when they occur on the "conspicuous" part of the form.

Compiling the "inconspicuous" species

Table D shows the suggested form for compiling "inconspicuous" species. Instead of using 14 x 17 inch compilation paper, the 17 x 27 inch size should be used. This means that headings for all of the 44 species for which the field data is "good" may be entered on one sheet, and that it will take approximately 14 sheets of paper to compile all of the data. On this form there are a few extra columns, one of which might be used for Balsamorhiza, even though it is classed as "fair" rather than "good." However, it is felt that the summary of "inconspicuous" species should, aside from this possible exception, be limited to those species for which the type map data are rated "good."

Constructing the type map

After the work of compiling is completed, a number of maps showing the blocks in Pasture I (as they were laid out in 1935, with reference stakes between quadrats serving as the north and south boundary between the blocks) should be obtained, and from the compiled data a distribution map of each species constructed. In constructing such a map for a given species, two intensities of the same color should be used, the more dense one being applied to those blocks where the species is "conspicuous", and the least intense shade used on blocks where the species was present but "inconspicuous." It

may be possible to combine a number of these distribution maps of the more important species and obtain a type map. For example, the summary of the conspicuous species will probably show that there are but six species that appeared as "conspicuous" more than a dozen times. One might use six distinct colors, and by dividing a block up into a number of smaller squares, apply the colors of the respective species present to these squares within the blocks; or one might take only the most abundant one of the "conspicuous" species for each block, and assign its color to the entire block. For only six species, symbols rather than colors might be used in each block, the result being a type map with the "conspicuous" species intermingled, somewhat the same as they occur in nature.