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STUDY OF A SECTION OF THE OREGON COAST FLORA

MORTON E. PECK

The following paper is the result of a somewhat detailed study of the flora of a small section of the Oregon coast in Lincoln county, namely, that lying between Yaquina Head and the mouth of Yachats river. These two points are distant from each other in a straight line about twenty-five miles; by the beach, striking across the mouths of the bays, the distant is perhaps twenty-eight miles. The flora in the neighborhood of Seal Rocks, about midway between the two points, received the most attention, though the whole ground was gone over rather carefully. This section is fairly representative of the entire coast of the state, except the extreme southern part.

Yaquina Head is a high, narrow headland, at the extremity of which is a lighthouse. From its landward end southward to the town of Newport there is a nearly straight coast line of about four miles, with a narrow beach. A mile above Newport, over a high bluff, is Nye Beach, a popular resort. Newport touches the north side of the mouth of Yaquina bay, a narrow, winding indentation some twelve miles in length. From the southern shore of the bay mouth to Alsea bay there is again a nearly straight coast line of thirteen miles, with an almost uninterrupted beach, which in places is quite wide. Much the same conditions hold from the mouth of Alsea bay to the mouth of Yachats river.

On the shoreward side of the beach we find a variety of conditions. Yaquina Head has no beach, but high, perpendicular sea-cliffs, rising to the eastward into bold, rounded bluffs. Southward to Nye Beach the shore face has a steep ascent, sometimes almost perpendicular above the narrow beach, to a height of perhaps twenty to forty feet. At Nye Beach the shore face is cut away and sand dunes have developed. On the southward side of Yaquina bay there is quite an extensive beach with a gradual rise to the landward, but a little farther to the south the steep shore bluffs begin again and continue with slight interruptions some distance below Seal Rocks. The latter are a group of picturesque rocks, mostly islanded by erosion of the shore. A mile below Seal

Rocks the steep bluffs stop, and from here to Alsea bay there is a continuous succession of sand drifts and dunes. Midway between Seal Rocks and Alsea bay behind the line of dunes is a small lake, called Sand lake, with an area of several acres. From Alsea bay to the mouth of the Yachats there is mostly a rather wide beach, and the country behind this is low with no shore bluffs.

Before taking up the flora a word should be said as to climatic conditions. The difference between the average summer and winter temperatures is of course relatively small. There is little freezing weather in winter and the summers are uniformly cool. The annual precipitation, nearly all rain, is about 72 inches. During at least half of the year clear days are the exception, and for the remainder cloudy weather and rain are to be expected at any time. Even during June, July, and August it frequently happens that the cloudy days greatly outnumber the clear. Very strong westerly winds prevail during the winter, and even in summer they are frequent, but less violent.

Let us now consider the several ecological groups of plants occurring in our territory, noting some of the more strongly marked effects of the environmental conditions upon some the species.

We may begin with the plants of the beach, including those that are occasionally reached by waves directly, and also those of the shore cliffs and damp seaward faces of those shore bluffs which are frequently wet by clouds of fine spray from the sea, so that the foliage is more or less encrusted with salt. The special factors here concerned are evidently high winds, copious moisture, sandy soil, and strong salinity. This group includes the following:

- | | |
|---------------------------------|---------------------------------|
| * <i>Abronia latifolia</i> | * <i>Eleocharis palustris</i> |
| * <i>Achillea millefolium</i> | <i>Elymus arenarius</i> |
| * <i>Agrostis alba</i> | * <i>Epilobium franciscanum</i> |
| * <i>A. exarata</i> | <i>Erigeron glaucus</i> |
| * <i>Aira praecox</i> | * <i>Festuca rubra</i> |
| <i>Ammodenia peploides</i> | * <i>Fragaria chilcensis</i> |
| * <i>Amsinckia lycopsoides</i> | <i>Franseria bipinnatifida</i> |
| <i>Angelica hendersoni</i> | <i>F. chamissonii</i> |
| * <i>Aster douglasii</i> | * <i>Grindelia oregana</i> |
| * <i>Calamagrostis aleutica</i> | * <i>Holcus lanatus</i> |
| <i>Cakile edentula</i> | * <i>Hypochaeris radicata</i> |
| <i>Carex macrocephala</i> | * <i>Juncus bufonius</i> |
| * <i>C. obnupta</i> | * <i>J. ensifolius</i> |
| * <i>Chenopodium album</i> | <i>J. falcatus</i> |
| <i>C. humile</i> | <i>Lathyrus littoralis</i> |
| * <i>Cirsium edule</i> | <i>Lobularia maritima</i> |
| * <i>C. lanceolatum</i> | * <i>Lolium multiflorum</i> |
| <i>Coneoselinum gmelini</i> | <i>L. perenne</i> |
| <i>Convolvulus soldanella</i> | <i>Lupinus littoralis</i> |
| <i>Cotula coronopifolia</i> | * <i>Lycopus americanus</i> |
| <i>Crambe maritima</i> | * <i>Maianthemum dilatatum</i> |
| <i>Distichlis spicata</i> | * <i>Mimulus langsdorfii</i> |

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Pentacæna ramosissima	Salicornia pacifica
*Picea sitchensis	*Salix hookeriana
*Plantago lanceolata	Scripus americanus
P. bigelovii	S. riparius
*P. major	*Sisyrinchium californicum
P. maritima	Spergularia macrotheca var.
*Poa annua	scariose
P. macrantha	S. sparsiflora
Polygonum paronychea	Statice armeria
*Potentilla anserina	Stellaria humifusa var. oblongi-
Rumex acetosella	folia
R. maritimus var. fueginus	Tanacetum huronense
*R. mexicanus	*T. repens
*Sagina occidentalis	Triglochin maritima

The species of this list marked with an asterisk are only incidentally seashore or salt marsh plants and are found more or less widely distributed in other situations; the rest are ordinary halophytes. On some species of the former group the effect of the exceptional environment is very marked, on others it is scarcely perceptible. It is noticeably more pronounced on those that occur most abundantly and appear to have made themselves at home among the true halophytes. These with their most prominent characteristics are the following:

Achillea millefolium.—Very low and stout, often only twelve to fifteen centimeters in height; foliage ample, glabrous and succulent. This is the variety *nigricans*. As we pass inland out of the influence of salt water and high winds it is found to intergrade perfectly with the usual Coast mountain form of the species.

Aira praecox.—Stout, the culms radiately spreading and nearly prostrate.

Agrostis alba.—Culms and rootstocks poorly differentiated from each other, long, abundantly branched, largely aerial but prostrate and rooting, mostly sparingly leafy throughout, the leaves very short; panicles mostly very small and contracted. This is the variety *maritima*, and all intergrades with the typical form are found as we recede from the maritime influence.

Agrostis exarata.—Remarkable for the very short, stout, spreading culms, often no more than fifteen cm. long; panicles large and dense; whole plant succulent. Intergrades perfectly with the typical form. This is *A. glomerata*.

Aster douglasii.—Extremely unlike the ordinary form of the species. Stems very short and depressed, often no more than ten to fifteen centimeters in length; leaves crowded, thick and glabrous;

rootstock system greatly developed. All intergrades with the typical form occur.

Eleocharis palustris.—Very short and relatively stout.

Epilobium franciscanum.—This is at best a poorly defined species. It is a rather low, stout, sparingly branched form with ample foliage and leaves somewhat fleshy. It is one of the *E. glandulosum* assemblage, which has been variously broken up into species and varieties without very satisfactory results. The present form is supposed to be confined to the seashore, but nearly or quite identical material has been found in the Willamette valley. Back from the beach it intergrades with other forms of *E. glandulosum*.

Festuca rubra.—In situations of maximum exposure to maritime influences this species is remarkably modified. The leaves are very rigid, folded, and strongly curved, surpassing the very short culms, while the panicles are extremely dense and contracted. All intergrades with the typical form occur.

Fragaria chilensis.—Very low with excessively developed runner system; leaves glabrous and shining above, the leaflets broad and thick. Intergrades with the ordinary inland form, which has thin glaucous leaves and narrower leaflets, are easily found in places where the maritime influences are less marked. The species here has flowers and fruit all summer. The fruit is decidedly saline.

Juncus ensifolius.—Stout, with large black heads and large perianth; leaves very narrow and thick. This is a strongly marked form intergrading, however, with the typical plant occurring farther inland.

Plantago major.—Leaves thick, usually wrinkled, and perfectly glabrous; spikes short and dense with large capsules. All intergrades with the typical form occur.

Rumex mexicanus.—Stems stout, often elongated and freely branched, completely prostrate; leaves oblong, fleshy, and very glabrous; panicle dense and akenes very large. A strongly marked phase. No intergrades with the typical form were found.

Sagina occidentalis (crassicaulis).—This species presents a phase closely paralleling that of *Epilobium franciscanum*. The branches are stout, fleshy, and prostrate, and the flowers and fruit large. *S. occidentalis* in typical form flourishes a little way back from the beach, and the two appear to completely intergrade.

Of the remaining facultative halophytes, nearly all show the effect of their exceptional environment in some degree. They are mostly

dwarfed, but in a few cases they are exceptionally large; pubescence is relatively scant and the leaves are slightly thickened.

Several of the true halophytes, for one reason or another, are of particular interest. Such are the following:

Abronia latifolia.—This species grows in abundance on the beach in various places, especially at the mouth of Alsea bay, where over quite a large area the fine clean sand is piled into rounded, billowy drifts, each drift crowned with one of these plants. The prostrate stems are completely buried and only the fleshy leaves and umbels of fragrant, orange-colored flowers are visible. The species is doubtless of considerable importance in catching and holding the drifting sand.

Angelica Hendersoni is a remarkable species, differing widely from others of the genus in its thick, leathery leaves and very dense umbels. It grows most abundantly along the extreme seaward margins of the shore bluffs, where it is often wet with driving clouds of spray. Here it is very low and stout. Farther back, in more protected situations, it is much taller.

Convolvulus soldanella.—This species is plentiful on the seaward faces of sandy bluffs just above the beach where the latter is narrow. It does not form a sufficiently close growth to greatly retard the movement of the sand.

Elymus arenarius.—This large, coarse grass is common along the seaward slopes of shore bluffs and dunes, and is more or less effective in checking the movements of the latter.

Erigeron glaucus is a low, stout, succulent plant, rarely to be found where it is not often wet with salt water. It is most abundant on exposed cliffs and projecting headlands.

Franseria bipinnatifida and *F. chamissonis*.—These species grow in precisely the same situations as *Abronia latifolia*. *F. chamissonis* is by far the more abundant of the two, occupying a large portion of the sand-drift area at the mouth of Alsea bay. The copious, silvery gray foliage with a satiny luster gives the plant a very striking and attractive appearance.

Juncus lescurii.—An abundant and characteristic species of the deep drifting sand and young dunes of the higher beach. The long decumbent and tangled wiry stems spring from a deep and strongly developed rootstock system. It is of importance in checking the movement of the wind-blown sand.

Juncus falcatus.—Very plentiful in wet sand on the low beach, where it sometimes forms almost a turf.

Lupinus littoralis.—This species often occurs with *Juncus lescurii*. It is remarkable among Lupines for its prostrate habit. Nowhere very abundant.

Plantago maritimus.—This form is more tolerant of salt water than any other land plant occurring in this section. Its favorite habitat is in clefts of the exposed faces of shore cliffs and rocky islets where it often grows so low down that it must frequently be submerged by the waves in winter.

Poa macrantha.—Plentiful in a few places. One of the most effectual retainers of the beach sand where it occurs in sufficient abundance.

The association of plants we have been considering passes more or less gradually into one much less subject to the influence of salt water, though doubtless more or less affected by the fine salt mist blown shoreward in windy weather. The area occupied by this group is for the most part fully exposed to the wind, which is consequently a most important factor in determining the character of the vegetation. This is of course particularly true of the shrubs and such dwarfed trees as are here capable of maintaining an existence. The territory occupied by this association is a narrow strip of land beginning just back of the edge of the shore bluff, or of the beach, as the case may be, and extending inland in some cases for several hundred yards, usually much less, according to the contour of the land. The area includes many seaward slopes, some moderately level land, occasional sand dunes that have become more or less fixed by vegetation, and a few small sphagnum bogs. The following species occur here:

- | | |
|---|---|
| <i>Achillea millefolium</i> | <i>Castilleja dixonii</i> |
| <i>Aira caryophylla</i> | <i>Centaurium umbellatum</i> |
| <i>Agoseris apargioides</i> | <i>Cerastium vulgatum</i> |
| <i>Agrostis alba</i> | <i>Chrysanthemum leucanthemum</i> var. |
| <i>A. exarata</i> | <i>pinnatifidum</i> |
| <i>A. hyemalis</i> | <i>Cirsium edule</i> |
| <i>A. hyemalis</i> var. <i>geminata</i> | <i>C. lanceolatum</i> |
| <i>Alchemilla occidentalis</i> | <i>Cornus canadensis</i> |
| <i>Anaphalis margaritacea</i> var. <i>oc-</i> | <i>Crepis capillaris</i> |
| <i>cidentalis</i> | <i>Deschampsia cæspitosa</i> |
| <i>Anemone oregana</i> | <i>Dipsacus sylvestris</i> |
| <i>Arctostaphylos tomentosa</i> | <i>Disporum smithii</i> |
| <i>A. uva-ursi</i> | <i>Epilobium angustifolium</i> |
| <i>Aster douglasii</i> | <i>E. glandulosum</i> var. <i>adenocaulon</i> |
| <i>Bellis perennis</i> | <i>Erigeron canadensis</i> |
| <i>Berberis aquifolium</i> | <i>Festuca rubra</i> |
| <i>Brassica campestris</i> | <i>Fragaria chilensis</i> |
| <i>Bromus hordaceus</i> | <i>Gaultheria shallon</i> |
| <i>B. marginatus</i> | <i>Gentiana sceptrum</i> |
| <i>Calamagrostis aleutica</i> | <i>Geranium molle</i> |
| <i>Carex pensilvanica</i> | <i>Gnaphalium chilense</i> |

<i>G. purpureum</i>	<i>R. occidentalis</i>
<i>Habenaria michaeli</i>	<i>Rhododendron californicum</i>
<i>Holcus lanatus</i>	<i>Rosa nutkana</i>
<i>Holodiscus discolor</i>	<i>Rubus macropetalus</i>
<i>Hypericum anagalloides</i>	<i>R. spectabilis</i>
<i>Hypochaeris radicata</i>	<i>Rumex acetosella</i>
<i>Iris tenax</i>	<i>Sagina occidentalis</i>
<i>Juncus bufonius</i>	<i>Salix hookeriana</i>
<i>J. effusus</i> var. <i>hesperius</i>	<i>Sanguisorba microcephala</i>
<i>J. ensifolius</i>	<i>Sisymbrium officinale</i> var. <i>leiocarpum</i>
<i>Ledum columbianum</i>	<i>Sisyrinchium californicum</i>
<i>Lolium perenne</i>	<i>Solidago elongata</i>
<i>Malanthemum dilatatum</i>	<i>S. glutinosa</i>
<i>Medicago lupulina</i>	<i>Spergularia rubra</i>
<i>Montia parviflora</i>	<i>Spiræa douglasii</i>
<i>Myrica californica</i>	<i>Spiranthes romanzoffiana</i>
<i>Oenanthe sarmentosa</i>	<i>Stellaria media</i>
<i>Panicum occidentale</i>	<i>Streptopus amplexifolius</i>
<i>Picea sitchensis</i>	<i>Synthyris rotundifolia</i>
<i>Pinus contorta</i>	<i>Taraxacum officinale</i>
<i>Plantago lanceolata</i>	<i>Trifolium dubium</i>
<i>P. major</i>	<i>T. fimbriatum</i>
<i>Poa annua</i>	<i>T. repens</i>
<i>P. pratensis</i>	<i>Urtica lyallii</i>
<i>Polygonum aviculare</i>	<i>Vaccinium ovatum</i>
<i>P. persicaria</i>	<i>V. parvifolium</i>
<i>Prunella vulgaris</i> var. <i>lanceolata</i>	<i>V. uliginosum</i> var. <i>mucronatum</i>
<i>Pyrola bracteata</i>	<i>Viola sarmentosa</i>
<i>Ranunculus bongardi</i>	

A number of species, such as certain aquatic and subaquatic forms, and others that barely come within this area are omitted from the list, as they contribute nothing toward an understanding of the characteristics of the assemblage as a whole, and will be mentioned elsewhere.

The most interesting of this group of species are the trees and shrubs, since they show to a more marked degree than the herbaceous plants the effect of their exposure to the winds from the sea.

Picea sitchensis is excessively distorted, and many of the trunks are inclined landward at a very low angle. The small branches and twigs on the seaward side are very short and densely matted, appearing as if closely clipped, so that viewed from this side the tree presents a smooth, sloping surface. The trees usually grow in close order but seldom in large groups, though in some instances they form a continuous border along the seaward side of a forest of more normal development. Often the closely interwoven and matted branches cut off the light to such an extent that all the lower limbs die out, and for the same reason no smaller vegetation springs up beneath them and among the close-ranked trunks there is a comparatively open space where a deep twilight always prevails. The trees are not commonly more than three or four meters in height, and so firm and rigid is this natural roof that with care one can walk over it without danger of falling through.

Pinus contorta is much less common than *Picea sitchensis*. Where it is most exposed it has a very short trunk with long, depressed branches. The whole tree is greatly distorted and usually not more than two or three meters in height.

Vaccinium ovatum is the most abundant and characteristic shrub of this area. It forms low, cushion-like clumps of remarkably uniform shape. These cushions have a low pitch on the seaward side, but a more abrupt slope on the landward, so that when one is looking across them from the west he sees a series of smooth, low, and gently sloping mounds, but from the east they present the appearance of large green hummocks. The branches are so closely matted and interwoven that one can often sit on the top of a bush without bending it over.

Myrica californica forms clumps somewhat similar to those of *Vaccinium ovatum*. *Gaultheria shallon* is dwarfed and matted, making a continuous turf-like growth where it is fully exposed. *Ledum columbianum*, *Rhododendron californicum*, *Rosa nutkana* and *Rubus spectabilis* are much dwarfed. The same is true of *Arctostaphylos tomentosa*, which, however, grows very sparingly in the most exposed places. *Vaccinium uliginosum* var. *mucronatum* is abundant in some localities, but it is too low to be affected by the winds.

Of the herbaceous plants it may be said in general that they show the effects of the peculiar environment just in proportion to the height which they reach under normal conditions; that is, they show more or less tendency to become low and stout.

The association we have just been considering passes more or less gradually into the forest on the landward side. The low vegetation that is fully exposed to the winds from the sea protects that on its leeward side, thus enabling the latter to grow a little taller, and this in turn protects that which succeeds. In this manner the powerful air currents that could not be withstood by the taller trees if they were exposed from the ground upward, are shot over their tops by the inclined plane up which they have been directed.

In some places the forest is extremely dense, in others it is more open. The area studied includes only the narrow strip of comparatively low coastal forest, which is approximately co-extensive with the distribution of *Pinus contorta* in this section. The land occupied by this forest association is in places comparatively level, and here we find the closest stand of trees. In other places it is hilly or cut by ravines and small swampy tracts. The species making up this assemblage are in the majority of cases the same as those occur-

ring in the area last considered, but they are here in very different proportions as to numbers, and in many cases they have a strikingly different habit. The following are the most important:

<i>Acer circinatum</i>	<i>Lysichiton camtschatcense</i>
<i>Achillea millefolium</i>	<i>Malanthemum dilatatum</i>
<i>Aira caryophylla</i>	<i>Mimulus dentatus</i>
<i>Agrostis alba</i>	<i>M. langsdorffii</i>
<i>Agrostis exarata</i>	<i>M. moschatus</i>
<i>Alnus oregona</i>	<i>Montia parviflora</i>
<i>Anaphalis margaritacea</i> var. <i>occidentalis</i>	<i>M. parvifolia</i>
<i>Anthemis cotula</i>	<i>M. sibirica</i>
<i>Arctostaphylos tomentosa</i>	<i>Myrica californica</i>
<i>A. uva-ursi</i>	<i>Phleum pratense</i>
<i>Aster douglasii</i>	<i>Picea sitchensis</i>
<i>Boschniakia hookeri</i>	<i>Pinus contorta</i>
<i>Boykinia elata</i>	<i>Prunella vulgaris</i> var. <i>lanceolata</i>
<i>Campanula scouleri</i>	<i>Pseudotsuga mucronata</i>
<i>Deschampsia elongata</i>	<i>Pyrus diversifolia</i>
<i>D. caespitosa</i>	<i>Ranunculus bongardi</i>
<i>Disporum smithii</i>	<i>Rhododendron californicum</i>
<i>Epilobium angustifolium</i>	<i>Ribes divaricatum</i>
<i>E. glandulosum</i> var. <i>adenocaulon</i>	<i>Ribes sanguineum</i>
<i>Epipactis declivens</i>	<i>Rosa gymnocarpa</i>
<i>Fragaria chilensis</i>	<i>Rubus laciniatus</i>
<i>Gallium triflorum</i>	<i>R. macropetalus</i>
<i>Gaultheria shallon</i>	<i>R. parviflorus</i>
<i>Gnaphalium palustre</i>	<i>R. spectabile</i>
<i>Holcus lanatus</i>	<i>Sambucus callicarpa</i>
<i>Holodiscus discolor</i>	<i>Spiraea douglasii</i>
<i>Hypericum anagalloides</i>	<i>Stachys ciliata</i>
<i>Hypochaeris radicata</i>	<i>Stellaria media</i>
<i>Juncus bufonius</i>	<i>Streptopus amplexifolius</i>
<i>J. effusus</i> var. <i>hesperius</i>	<i>Thuja plicata</i>
<i>J. ensifolius</i>	<i>Tolmiea menziesii</i>
<i>Ledum columbianum</i>	<i>Trientalis latifolia</i>
<i>Lonicera involucrata</i>	<i>Trisetum cernuum</i>
<i>Lotus crassifolius</i>	<i>Vaccinium ovatum</i>
<i>Luzula campestris</i> var. <i>multiflora</i>	<i>V. parvifolium</i>
<i>L. parviflora</i>	<i>Viola sarmentosa</i>

As in the case of the preceding area various aquatics and species not of regular occurrence here, especially a number of introduced forms, are omitted.

The following merit special mention:

Achillea millefolium.—In some cases reaches one meter in height, with lax and diffuse foliage, in strong contrast to the dwarf form with thick foliage found close to the sea.

Aster douglasii.—Wholly different in appearance from the beach form, developing into tall, widely branched plants, some of them 130 centimeters in height.

Gaultheria shallon.—The most abundant shrub, often forming a nearly impenetrable growth. Attains a height of three meters.

Myrica californica.—Very abundant, making up a large part of the tall undergrowth. Reaches a height of five meters.

Picea sitchensis.—Plentiful, though less so than the next species. The trees are well formed but small; however, they increase in size as well as in abundance as we go eastward.

Pinus contorta.—This is the most abundant tree. In many places it forms by far the dominant species, and there are considerable tracts where it occurs in almost pure stands. Places were noted where the plant association just previously described passed quite abruptly into one of these pine areas, and here appeared in strong contrast the two extreme forms of development of this tree. Along the exposed forest edge the trees were low and distorted with relatively stout trunks and long, horizontal or depressed branches. This is typical of *P. contorta*. A little farther back, where the growth was dense and the effect of the wind scarcely noticeable, the trees attained the tall slender *P. murryana* (Lodgepole Pine) form, practically indistinguishable from that of the Canadian zone tree of the Cascade mountains, except in the mode of weathering or splitting and cleaving of the bark, the difference here being doubtless due to differences in moisture, temperature, etc. The largest specimens noted were perhaps thirty centimeters in diameter and fifteen to seventeen meters in height.

Rhododendron californicum.—An abundant and conspicuous shrub, here reaching the dimensions of a small tree. Specimens seven meters in height were seen.

Rubus spectabilis.—A highly characteristic species of this section. The straggling bushes, partly supported by surrounding vegetation, attain a height of three to four meters.

Spiraea douglasii.—Plentiful in the more open places. Sometimes over three meters in height.

Tsuga heterophylla.—Moderately plentiful. The trees are small, but increase in size and numbers eastward.

Vaccinium microphyllum.—Rather infrequent among the tall undergrowth, but attaining nearly the maximum size of the species.

Vaccinium ovatum.—Abundant, forming a considerable part of the tall undergrowth. The bushes are erect, strict and sparingly branched, often five meters in height. The contrast between this species as it appears here and on the wind-swept areas above the beach is most remarkable.

Where the forest is most dense low herbaceous vegetation is nearly wanting. The most abundant and generally distributed species is perhaps *Pteridium aquilinum* var. *pubescens*, which is

often two meters or more in height. In the more open places small plants are abundant. Among the commonest are *Aira caryophyllea*, *agrostis alba*, *Campanula scouleri*, *Deschampsia elongata*, *Disporum smithii*, *Fragaria chilensis*, *Holcus lanatus*, *Hypericum anagalloides*, *Hypochæris radicata*, *Juncus effusus* var. *hesperius*, *Maianthemum dilatatum*, and *Viola sarmentosa*.

In several places there are groups of small hillocks sparingly wooded. Their contour indicates that they are old sand dunes that have become fixed by the development of a mantle of vegetation over their surface. Here *Pinus contorta* is rather low and widely branched but not distorted. *Arctostaphylos tomentosa* and *A. uva-ursi* are particularly plentiful, and there is an abundance of herbaceous vegetation.

Within the area under consideration there are several fresh water ponds and swamps. Sand lake, about two miles below Seal Rocks, with the marshy tract adjoining it, illustrates well this formation. In the shallow water at the northern end of the lake there is a colony of *Nymphaea polysepala* and one of *Potamogeton natans*. Along the margin of the water there is an abundance of *Lilæopsis occidentalis* and *Sparganium angustifolium*. A dense border of *Carex obnupta* extends much of the way around the lake. The swamp tract runs northward for some distance, terminating in a sphagnum bog of moderate size. Here were found several species not elsewhere noted: *Carex leptalea*, *C. sitchensis*, *Comarum palustre*, *Drosera rotundifolia*, *Eriophorum chamisonis*, and *Trientalis arctica*.

To the eastward the low forest area under consideration rises gradually into the great Coast mountain forest. The former is wholly wanting about the bays, where some protection is afforded from the westerly winds. Except where fires have swept over them or extensive lumbering operations have been carried on, the western slopes of the Coast mountains are covered with a magnificent growth of *Picea sitchensis*, *Pseudotsuga mucronata*, and *Tsuga heterophylla*, with other trees in much smaller numbers. With this forest we are not particularly concerned and no detail account of it will be given.

In studying the coast flora from the taxonomic standpoint one is impressed with the inconsistencies of the systematists in their treatment of those forms that have assumed special characteristics as the result of maritime influences. Thus if the beach forms of *Achillea millefolium*, *Agrostis alba* and *Sagina occidentalis* should receive varietal or even specific recognition, there is no legitimate

reason why the same treatment should not be given the equally well marked maritime phases of *Aster douglasii*, *Festuca rubra*, *Rumex mexicanus*, and others.

Many species of plants that play a more or less important part in the total make-up of the vegetation of our territory have received no special mention in the foregoing discussion. It seems desirable therefore, to add the following distributional list, in which are included the names of all the seed plants ascertained to occur within our limits. Doubtless the list is far from complete for this section, especially as regards the flora about the bays.

For the records of a number of the species as well as for assistance on some points of nomenclature, I am indebted to Principal J. C. Nelson, of the Salem High School, who collected about Newport and Toledo in the summer of 1916.

Taxaceæ.

Taxus brevifolia Nutt.—Found sparingly about the bays.

Pinaceæ.

Thuja plicata Donn.—Only a few small trees were noted.

Pinus contorta Dougl.—Abundant everywhere, the distribution almost exactly coinciding with the area here under consideration.

Pseudotsuga mucronata (Raf.) Sudw.—Moderately plentiful, but always small.

Picea sitchensis Carr.—The most abundant tree excepting *Pinus contorta*, with which it is usually mingled. In protected situations the great forest of Spruce and Douglas Fir comes down to the edge of salt water, as is the case about the bays; elsewhere the trees are much smaller.

Tsuga heterophylla (Raf.) Sarg.—Moderately plentiful in the zone of low forest.

Sparganiaceæ.

Sparganium angustifolium Michx.—Plentiful in Sand lake, two miles south of Seal Rocks.

Najadaceæ.

Potamogeton natans L.—Plentiful in Sand lake.

P. pusillus L.—In pools near Newport.

Zostera marina L.—Abundant at the mouth of Yaquina bay and in drift along the beach. Good flowering and fruiting specimens were secured, which apparently is unusual.

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Phyllospadix torreyi Wats.—Abundant everywhere on submerged rocks.

Juncaginaceæ.

Triglochin maritima L.—Plentiful in marshes about the bays.

Gramineæ.

Panicum occidentale Scribn.—Abundant in sandy open ground.

Anthoxanthum odoratum L.—Plentiful about Newport and Nye Beach.

Phleum pratense L.—Frequently found in more or less protected situations; often reaches a remarkable size.

Polypogon monspeliensis (L.) Desv.—Found sparingly on the beach at Newport.

Calamagrostis aleutica Trin.—Plentiful in the open area just above the beach.

C. canadensis (Michx.) Beauv.—Observed only on steep banks at the mouth of Alsea bay.

Agrostis alba L.—Common in suitable localities.

A. alba L. var. *maritima* G. W. F. Mey.—Plentiful in wet places on the beach where the water is more or less brackish.

A. exarata Trin.—Common in wet places above the beach. The *A. glomerata* form is not rare close to salt water, while the intermediate forms occur in intermediate situations.

A. hyemalis (Walt.) B. S. P.—Common in somewhat protected places.

A. hyemalis (Walt.) B. S. P. var. *geminata* (Trin.) Hitch.—Frequent, with the type.

Holcus lanatus L.—The most abundant grass. Where closely pastured it forms a very dense turf; in other places it attains an unusual size.

Aira caryophyllea L.—Abundant nearly everywhere in open ground except on the beach.

Deschampsia cæspitosa (L.) Beauv.—Plentiful in wet ground.

D. holciformis (Presl) Steud.—Only at Yaquina Head. This species seems to be known at only one or two other localities in the state.

D. elongata (Hook.) Munro.—Common in the forest area.

Trisetum cernuum Trin.—Frequent in the forest.

Bromus marginatus Nees.—Frequent in more or less open, protected places.

B. horridus L.—Common, with the preceding.

B. vulgaris L. var. *eximius* Shear.—Frequent in the forest area.

Dactylis glomerata L.—Frequent in open protected places.

Poa annua L.—Common nearly everywhere, including the beach.

P. compressa L.—Frequent in open, especially cultivated ground.

P. macrantha Vasey.—Abundant on the beach and low dunes at Newport; elsewhere scarce.

Poa pratensis L.—Common in open ground, but not forming turf.

Distichlis spicata (L.) Greene.—Found rather sparingly along the beach, but very abundant in swampy ground about the bays.

Festuca megalura Nutt.—Common, especially about houses and in cultivated land.

F. myuros L.—Found sparingly in openings in the forest at Seal Rocks.

F. rubra L.—Typical form common well back from the beach, especially in open ground. Maritime form abundant in many places on steep seaward faces of shore bluffs.

F. etatior L.—Common in open protected places.

Panicularia leptostachya Buckl.—Plentiful in small streams at Seal Rocks.

P. americana Torr.—Found sparingly along streams at Seal Rocks.

Puccinellia paupercula (Holm) Fern and Weath. var. *alaskana* (Scrib. & Merrill) Fern. & Mer.—Occurs sparingly about Yaquina bay.

Lolium multiflorum Lam.—On high beach at Newport.

L. perenne L.—Common in open ground, especially about houses at Newport and Seal Rocks.

Agropyron cæsius Presl.—Found only about the lighthouse on Yaquina Head. Apparently the only record of its occurrence in the state (Nelson).

Elymus arenarius L.—Common along the beach and on low dunes.

Hordeum jubatum L.—Occurs sparingly about the bays.

Cyperaceæ.

Carex leptalea Wahl.—In sphagnum bog two miles below Seal Rocks.

C. macrocephala Willd.—A few specimens found at Newport, Seal Rocks, and three miles south of Alsea bay on the beach and low seaward slopes of shore bluffs.

C. pansa Bail.—Found in abundance a short distance above the beach on the south side of Yaquina bay and at Waldport near the mouth of Alsea bay.

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C. sitchensis Presc.—Abundant in a sphagnum bog two miles south of Seal Rocks.

C. cryptocarpa C. A. Mey.—Plentiful in marshes about Yaquina bay.

C. obnupta Bail.—Abundant in swampy ground above the beach, and occasional on the beach.

Eleocharis palustris (L.) R. and S.—Abundant in swampy places: occasionally found on the beach.

Scirpus riparius (R. Br.) Spreng.—Common on low beaches.

S. occidentalis (Wats.) Chase.—Found sparingly about Yaquina bay.

S. americanus Pers.—Abundant in places along the beach and in brackish swamps.

S. robustus Pursh.—In swamps about Yaquina bay.

Eriophorum chamissonis C. A. Mey.—Occurs sparingly in a sphagnum bog two miles south of Seal Rocks.

Araceæ.

Lysichiton camtschaticense (L.) Schott.—Found only well back from the beach. Mainly a plant of the deep forest.

Juncaceæ.

Juncus effusus L. var. *hesperius* Piper.—Plentiful in wet non-saline places.

J. balticus Willd.—In marshes about Yaquina bay.

J. lescurii Boland.—Especially abundant on the sandy seaward faces of shore bluffs, also on low dunes and beaches.

J. falcatus Mey.—Abundant on beaches and in saline swampy ground.

J. ensifolius Wiks.—Common on beaches and along streams.

J. bolanderi Eng.—Abundant in various places along streams.

J. oreganus Wats.—Found plentifully in a swampy tract a mile south of Seal Rocks. This appears to be the only locality in the state from which it has been reported.

Luzula campestris (L.) DC. var. *multiflora* (Ehr.) Celak.—Common in open woods and thickets.

L. parviflorum Desv.—Common in the forest area.

Liliaceæ.

Lilium columbianum Hans.—On old dunes near Newport.

Streptopus amplexifolius (L.) DC.—Plentiful in the open area above the beach and in the forest.

Disporum smithii (Hook.) Piper.—Common in openings in the forest.

Maianthemum dilatatum (Wood) Nels. and Macbr.—Abundant nearly everywhere.

Iridaceæ.

Iris tenax Wats.—Plentiful in open places above the beach.

Sisyrinchium californicum Ait.—Abundant nearly everywhere in wet ground.

Orchidaceæ.

Habenaria leucostachys Wats.—In wet protected places at Newport.

H. michaeli Greene.—Rather rare on exposed bluffs at Seal Rocks.

Spiranthes romanzoffiana Cham.—Common in nearly all open places except on the beach.

Epipactis decipiens (Hook.) Ames.—Numerous in the forest.

Salicaceæ.

Salix hookeriana Barratt.—Common everywhere at the mouths of streams, also about slightly saline, or quite fresh swamps some distance back.

Myricaceæ.

Myrica californica Cham.—Abundant everywhere as tall undergrowth in the forest and as dwarfed shrubs on the exposed bluffs.

Betulaceæ.

Alnus oregana Nutt.—Abundant in many places well back from the beach; comes nearly to the beach along streams.

Urticaceæ.

Urtica lyallii Wats.—Rare in protected open places.

Polygonaceæ.

Rumex acetosella L.—Common in open places down to the beach.

R. occidentalis Wats.—Not common, in open protected places.

R. maritimus L. var. *fueginus* (Phil.) Dusen.—Relatively rare on the beach.

R. obtusifolius L.—Common in open places above the beach.

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R. mexicanus Meisn.—Beach form plentiful; typical form not found.

R. crispus L.—In open ground above the beach.

R. conglomeratus Murr.—Rare in open ground.

Polygonum paronychea Cham. and Schl.—Abundant on the extensive dune area at the mouth of Alsea bay; also found near Yachats and Seal Rocks.

P. aviculare L.—Common in open pastured places; also on beaches.

P. persicaria L.—Frequent at Seal Rocks along streams.

Chenopodiaceæ.

Salicornia pacifica Steudl.—Abundant in salt marshes about the bays. Rare on the beach.

Atriplex patula L. var. *littoralis* Gray.—Scarce, along Yaquina bay near Newport.

Chenopodium humile Hook.—Scarce, on high beaches.

C. album L.—Scarce, on high beaches.

C. hybridum L.—Scarce, in open places about Newport.

Nyctaginaceæ.

Abronia latifolia Esch.—Plentiful everywhere on sandy beaches, extending down to a little below the upper limits of high winter tides; especially plentiful about the mouth of Alsea bay.

Portulacaceæ.

Montia sibirica L.—Scarce in low forest area; abundant in larger forest.

M. parviflora (Doug.) Howell.—Abundant above the beach.

M. parvifolia (Moc.) Greene.—Common on rocks in protected places.

Garyophyllaceæ.

Pentacæna ramosissima (Wein.) Hook & Arn.—Plentiful just above the beach at the mouth of Yaquina Bay.

Spergularia rubra (L.) J. and C. Presl.—Common in open places, in some places well down on the beach.

S. sparsiflora (Greene) Nels.—Scarce along the beach; more plentiful in salt marshes about the bays.

S. macrotheca (Hornem.) Heynh. var. *scariosa* (Britt.) Robins.—Scarce on seaward faces of shore bluffs where sometimes wet by

Spergula arvensis L.—Plentiful in open, especially cultivated ground.

Cerastium arvense L.—Common in open sandy places above the beach.

C. vulgatum L.—Common on steep bluffs above the beach, also in open places in the forest.

Stellaria média L.—Common above the beach.

S. borealis Bigel. var. *bongardiana* Fern.—Abundant in swampy ground above the beach at Seal Rocks.

Sagina occidentalis Wats.—Typical form abundant on exposed bluffs above the beach. *S. crassicaulis* form plentiful on wet rocks close to salt water.

Ammodenia peploides (L.) Rupr.—Scarce on beach at Seal Rocks and mouth of Yaquina bay.

Nympheaceæ.

Nympheæa polysepala (Eng.) Greene.—A few plants found in Sand lake, two miles below Seal Rocks.

Ranunculaceæ.

Anemone oregana Gray.—Abundant on high, exposed bluffs on Yaquina Head.

Ranunculus flammula (L.) var. *unalaschensis* (Bess.) Ledeb.—Common in swampy places, in some places on the beach within reach of the spray.

R. occidentalis Nutt.—Common in open ground above the beach.

R. bongardi Greene var. *douglasii* (Howell) Davis.—Plentiful in forest area.

Berberidaceæ.

Berberis aquifolium Pursh.—Abundant in many places on exposed bluffs, and at some localities on sand dunes.

Cruciferae.

Lobularia maritima Desb.—On the beach at Newport.

Capsella bursa-pastoris (L.) Medic.—Common in open protected places.

Cakile edentula (Bigel.) Hook.—Plentiful on the beach and on seaward slopes of dunes about Newport; scarce farther south.

Dentaria tenella Pursh.—Plentiful in forest.

Cardamine breweri Wats.—In wet places in the forest at Newport.

C. oligosperma Nutt.—Common in forest.

Brassica campestris L.—Plentiful in open protected places.

B. oleracea L.—On bluffs above the beach at Seal Rocks.

Crambe maritima L.—At the foot of the cliffs near the lighthouse on Yaquina Head, where apparently well established. This is the only locality on the Pacific coast from which it has been reported (Nelson).

Sisymbrium officinale (L.) var. *leiocarpum* DC.—Scarce in protected places at Seal Rocks.

Droseraceæ.

Drosera rotundifolia L.—Plentiful in a sphagnum bog two miles below Seal Rocks.

Saxifragaceæ.

Ribes lacustre (Pers.) Poir.—Scarce, near the mouth of Yaquina bay.

R. divaricatum Dougl.—Frequent in open protected places at Seal Rocks.

R. sanguineum Pursh.—Common in the forest at Seal Rocks and Newport.

Boykinia elata Nutt.—Abundant in the forest.

Chrysosplenium scouleri (Hook.) Rose.—In the forest at Newport.

Tiarella trifoliata L.—Plentiful in the forest at Newport.

Tolmiea menziesii Torr. & Gray.—Common in the forest.

Rosaceæ.

Pyrus diversifolia Bong.—Common in the forest area.

Holodiscus discolor (Pursh) Maxim.—Infrequent in low woods.

Spiræa Douglasii Hook.—Abundant along streams and about swampy tracts in the forest area.

Rubus macropetalus Dougl.—Abundant nearly everywhere above the beach in open ground.

R. parviflorus Nutt.—Common nearly everywhere above the beach.

R. laciniatus Willd.—Generally established throughout our area in partly open ground.

R. spectabilis Pursh.—Abundant nearly everywhere above the beach.

Rosa gymnocarpa Nutt.—Common in the forest area.

R. nutkana Presl.—Common in low thickets and open places.

Alchemilla occidentalis Nutt.—Common in open ground at Newport.

Sanguisorba microcephala Presl.—Plentiful in open boggy ground at Yachats.

Potentilla anserina L.—Abundant everywhere in wet ground.

Fragaria chilensis (L.) Duch.—Abundant on rocks and seaward faces of shore bluffs nearly down to tide line, here showing the maritime characteristics. Equally abundant back to the forest area, passing gradually into the usual form.

Comarum palustre L.—Plentiful in sphagnum bogs below Seal Rocks.

Leguminosæ.

Lupinus littoralis Dougl.—Common on high beaches and seaward slopes of shore bluffs nearly everywhere.

Ulex europæus L.—Established on stream banks at Newport and Yachats.

Trifolium microcephalum Pursh.—Common in moist open places along the foot of shore bluffs at Seal Rocks and Newport.

T. fimbriatum Lindl.—Abundant everywhere from beach to forest.

T. repens L.—Very abundant in open and exposed places, especially where pastured.

T. hybridum L.—Common in open ground at Seal Rocks.

T. pratense L.—Scarce, in open places.

T. dubium Smith—Common in open places above the beach.

Medicago lupulina L.—Common in open ground.

Vicia gigantea Hook.—Along the beach, scarce.

Lathyrus littoralis (Nutt.) Endl.—Abundant on the beach and on sandy bluffs facing the sea.

L. maritimus (L.) Bigel.—Scarce along the beach.

Lotus crassifolius (Benth.) Greene.—Common in the forest area.

L. formosissimus Greene.—Frequent in seepage along the foot of the shore bluffs.

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Geraniaceæ.

Geranium molle L.—Plentiful about Seal Rocks and Newport.

Aceraceæ.

Acer circinatum Pursh.—Plentiful along streams well back from the beach.

Hypericaceæ.

Hypericum anagalloides C. and S.—Abundant everywhere in wet ground above the beach.

Violaceæ.

Viola macloskeyi Lloyd.—In sphagnum bogs at Seal Rocks and Newport.

V. sarmentosa Dougl.—Abundant in the forest area.

V. adunca Smith.—Abundant in open exposed situations.

Onagraceæ.

Epilobium angustifolium L.—Common in thickets on bluffs above the beach and in the forest area.

E. franciscanum Barb.—Common along the seaward faces of shore bluffs in seepage.

E. glandulosum Lehm. var. *adenocaulon* (Hausk.) Fern.—Abundant from just above the beach, where it intergrades with the preceding, to the forest, where it assumes the usual form.

Umbelliferæ.

Daucus pusillus Michx.—Near the lighthouse on Yaquina Head.

Angelica hendersoni Coult. and Rose.—Abundant along the margin of ocean bluffs and on the seaward slope.

Coneoselinum gmelini (C. and S.) Coult. and Rose.—Common, mostly on steep seaward faces of shore bluffs.

Oenanthe sarmentosa Presl.—Abundant in streams and non-saline swamps.

Lilæopsis occidentalis Coult. and Rose.—Abundant on the margin of Sand lake.

Ligusticum apiodorum (Gray) Coult. and Rose.—On sand drifts at Newport.

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Ghlenia littoralis (Gray) Schmidt.—In drifting sand at Newport.

Cornaceæ.

Cornus canadensis L.—Scarce in thickets at Newport, Seal Rocks, and Yachats.

Pyrolaceæ.

Newberrya congesta (Torr.) Gray.—One specimen in forest at Seal Rocks.

Pyrola bracteata Hook.—Scarce in thickets and in the forest area.

Ericaceæ.

Vaccinium ovatum Pursh.—The most abundant shrub on the exposed area above the beach; also very plentiful in the forest.

V. uliginosum L. var. *mucronatum* Herder.—Abundant in many places from Newport to Alsea bay, mostly about the borders of sphagnum bogs.

V. parvifolium Smith.—Common in thickets and forest.

Gaultheria shallon Pursh.—Very abundant everywhere above the beach.

Arctostaphylos tomentosa (Pursh.) Dougl.—Common in thickets along the shore bluffs.

A. uva-ursi (L.) Spreng.—Abundant in open ground above the beach.

Ledum columbianum Piper.—Abundant from edge of sea bluffs to forest.

Rhododendron californicum Hook.—Abundant from margin of sea bluffs to forest.

Primulaceæ.

Trientalis latifolia Hooker.—Frequent in forest.

T. arctica Fisch.—Plentiful in sphagnum bog, two miles below Seal Rocks.

Plumbaginaceæ.

Statice armeria L.—Found sparingly on seaward faces of bluffs at Seal Rocks.

Gentianaceæ.

Centaurium umbellatum Gilib.—In open ground at Seal Rocks, scarce.

Gentiana sceptrum Griseb.—Plentiful about sphagnum bogs at Seal Rocks and Yachats.

Convolvulaceæ.

Convolvulus soldanella L.—Frequent on the beach and on low sand dunes.

Cuscutaceæ.

Cuscuta squamigera (Eng.) Piper.—On *Salicornia* in tide marshes along Yaquina bay.

Polemoniaceæ.

Gilia capitata Hook.—Scarce, on drifting sand near the mouth of Yaquina bay.

Hydrophyllaceæ.

Romanzoffia sitchensis Bong.—In forest near Newport.

R. unalaschensis Cham.—In clefts of rock some distance from the sea on Yaquina Head. Apparently the only locality for the state.

Boraginaceæ.

Amsinckia lycopsoides Lehm.—Scarce along seaward faces of shore bluffs at Seal Rocks; more plentiful in similar places at Yachats.

Labiatae.

Lycopus americanus Muhl.—Abundant in swampy ground at Seal Rocks and Yachats; less plentiful along the beach.

Mentha canadensis L. var. *borealis* (Michx.) Piper.—Common along streams and in seepage at foot of shore bluffs.

M. piperita L.—Common along streams at Seal Rocks.

M. spicata L.—In one locality at Seal Rocks.

Glechoma hederacea L.—Plentiful in wet ground about Newport.

Prunella vulgaris L. var. *lanceolata* (Bart.) Fern.—Abundant nearly everywhere above the beach.

Stachys ciliata Dougl.—Common along streams at Seal Rocks.

Scrophulariaceæ.

Scrophularia californica Cham.—Scarce in open protected places.

Synthyris rotundifolia Gray.—Common on exposed bluffs at Yaquina Head.

Veronica scutellata L.—Common in swampy ground at Seal Rocks and Yachats.

V. americana Schwein.—Common in swampy ground and in seepage at foot of bluffs along the beach.

V. humifusa Dicks.—Common in low ground at Seal Rocks.

Mimulus dentatus Nutt.—Common in wet places along streams and on slopes of shore bluffs.

M. moschatus Dougl.—Common in wet places above the beach.

M. langsdorfii Donn.—Common in swampy ground and on wet seaward faces of shore bluffs.

Castilleja miniata Dougl.—Frequent in protected places well back from the beach.

C. dixonii Fern.—Rare near the margin of shore bluffs at Seal Rocks.

Orthocarpus castilleoides Benth.—Abundant in somewhat swampy saline places at Yachats.

Orobanchaceæ.

Boschniakia hookeri Walp.—Scarce, on *Arctostaphylos tomentosa* at Newport.

Plantaginaceæ.

Plantago major L.—Abundant on the beach and elsewhere in open places.

P. major L. var. *asiatica* (L.) Dcne.—Just above the beach at the mouth of Yaquina bay.

P. lanceolata L.—Abundant nearly everywhere in open exposed places.

P. bigelovii Gray.—At Yachats, barely above tide-line.

P. maritima L.—Abundant on rocks and shore bluffs close to salt water.

P. subnuda Pilg.—In swamps along Yaquina bay. Most northerly known station on the coast (Nelson).

Rubiaceæ.

Galium triflorum Michx.—Common in forest.

G. claytoni Michx. var. *subbiflorum* Wieg.—Plentiful in wet sand and swamps.

Caprifollaceæ.

Sambucus callicarpa Greene.—Common in high thickets.

Lonicera involucrata Banks.—Common in thickets and along

Dipsacaceæ.

Dipsacus sylvestris Huds.—Scarce in open protected places at Seal Rocks.

Campanulaceæ.

Campanula scouleri Hook.—Common in forest.

Compositæ.

Hypochæris radicata L.—Extremely abundant in all open places, often forming almost a pure growth over large areas.

Taraxacum officinale L.—Common in open ground above the beach.

Agoseris apargioides (Gess.) Greene.—Found only on dunes at Sand lake.

Crepis capillaris (L.) Wallr.—Plentiful in open exposed ground.

Sonchus asper (L.) Hill.—Abundant in open ground.

S. oleraceus L.—Common along seaward faces of shore bluffs.

Franseria bipinnatifida Nutt.—Common on the beach.

F. chamissonis Less.—Abundant on sand drifts at the mouth of Alsea bay, scarce on the beach elsewhere.

Grindelia oregana Gray.—Found only on the beach three miles south of Alsea bay.

Solidago glutinosa Nutt.—Scarce in low thickets at Seal Rocks.

S. elongata Nutt.—Frequent in open protected places near Newport.

Bellis perennis L.—Abundant nearly everywhere from upper limit of beach to forest.

Erigeron canadensis L.—Frequent in open places.

E. glaucus Ker.—Plentiful on exposed faces of shore bluffs and cliffs.

Aster douglasii Lindl.—Abundant from the beach to the forest.

Baccharis pilularis DC.—Plentiful on slopes above Yaquina bay near Newport.

Achillea millefolium L.—Common in protected, more or less open ground.

A. millefolium (L.) var. *nigricans* E. Mey.—Plentiful on margins of shore bluffs above the sea and on exposed dunes.

Anthemis cotula L.—Common in open ground.

Chrysanthemum leucanthemum L. var. *pinnatifidum* Lec. and Lim.—Scarce at Seal Rocks in open ground; also at Yaquina Head.

Cotula coronopifolia L.—On the beach, four miles above Ya-chats; also near the mouth of Yaquina bay.

Tanacetum huronense Nutt.—Common along the beach and on low dunes.

Petasites speciosa (Nutt.) Piper.—Along a small stream at Nye Beach.

Senecio vulgaris L.—Plentiful in open ground above the beach.

S. sylvaticus L.—Near the mouth of Yaquina bay on both sides, in protected places.

S. bolanderi Gray.—Common on sand drifts near Newport.

Anaphalis margaritacea (L.) Benth. and Hook. var. *occidentalis* Greene.—Abundant from seaward slope of shore bluffs to the forest.

Gnaphalium purpureum L.—Abundant in all open places above the beach.

G. palustre. Nutt.—Plentiful in open places.

G. chilense Spring.—One specimen on sand drifts on south side of Yaquina bay.

Centaurea cyaneus L.—Common in open places.

Cirsium lanceolatum (L.) Scop.—Common from exposed margin of shore bluffs to forest. Very dwarfed where most exposed.

C. edule Nutt.—In exposed places down to the beach; common.

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