
Index

- abstraction, effects, 196
acid peat streams, 291
acid precipitation pollution, 472
acid sands (and associated vegetation), 243, 279, 280–1, 320, 321, 393
Acorus calamus, 170
administration, watercourse, 428–9
Agro Pontino, reclamation in the, 200
Agrostis stolonifera, 185–6, 255, 411, 435
Akerhuis, plant communities in, 360–1
Alisma
– *A. lanceolata*, 170, 325
– *A. plantago-aquatica*, 7, 155, 163, 164, 166, 170, 181, 185, 340, 348, 358, 376, 391
alluvium (plains)
– outwash, 318
– watercourses, 259–60, 319, 320, 331–2, 339–40
 coastal, 274–5, 278, 324–5
 inland, 325–6
Alnus glutinosa, 268, 421
Alpine type watercourses, *see* mountains, uplands and hills
Alps (French), 306–7
– limestone streams, 315
– Resistant rock streams, 324
Alps (Italian), 324, 335, 337
altitude, river classification by, 26
Alzette, R., 283–5
ammonium-nitrogen, effects, 459–61
Amose, R., 229
animal
– classifications, 25
– grazing, effects, 427–8
Apium nodiflorum, 42, 70, 76, 100, 170, 177, 178, 182, 216, 241, 291, 311, 340, 342, 389, 391, 439, 463
Apennines, 334, 337, 340
Apulia, streams and channels, 342
arableisation, 202–3
Ardennes
– Belgian, 277, 282–3
– Luxembourgise, 283, 285
Ariege, R., 233, 234
Arundo, 342, 344
– *A. donax*, 74, 173, 338, 341, 343, 344, 355
associations, species, 365, 376, 386–92
Aube, R., 235, 236
Avoca, R., 232
Bandon, R., 232
banks/embankments, 15, 17–22, 295–6
– protection, 409–12
barriers, river, effects, 194–5
Barrow, R., 232
Basilicata, 341
Bayerischer Wald, vegetation associated with, 266
Belgian Lorraine, S.E., streams, 281
Belgium, 53, 379
– drainage patterns, 30
– landscape, 275–6
– land use, 275–6
– plant communities, 275–83
– pollution, 433–4, 445, 446, 453, 453–4, 472
 assessment, 483
– rivers and streams, 379, 483
 discharges, 61
 maps, 229–30, 434
 types, 278–83
– rock type, 276, 277
 and landscape, rivers and vegetation associated with, 278–83
 mixed, 280
– species distribution, factors affecting, 100, 453
 species grouping by Colour banding, 124–6, 153
 star diagrams of nutrient regimes in, 140–2
 vegetation determinants, 7
 Western, 282
Berula erecta, 42, 76, 153, 164, 170, 177, 178, 182, 204, 253, 259, 261, 262, 271, 272, 274, 317, 335, 336, 376, 378, 389, 391, 439, 462, 464
biocide pollution, 470
bioclimate, 49–51
biotypology, 27
blockage by plants, problems caused, 414–19
boats
– capacity, species distribution related to, 108
– damage caused by, 407, 410–11
– interactions with vegetation, 407–12
 mathematical equation expressing, 411–12
bogs, *see* marshes and bogs
Bouches du Rhône watercourses, 325
Britain
– Colour band assemblages in, 139, 149, 153
– drainage patterns, 31, 425
– dykes and drains, 149, 417, 418, 479, 480
 problems caused by vegetation blocking, 415, 416, 417, 418, 419
– habitat group distributions, 189
– landscape types, 240
– plant communities in, 239–49, 374
– pollution, 432–3, 472
 recovery, 442–4
 status (of various rivers), 443
– precipitation and its effects, 52, 57
– rivers and streams, 375–6, 378
 classification, 26
 Damage Ratings, 476–8, 481
 discharge, 56, 57, 60, 64
 indicator species, 374–5
 management, 41, 424
 maps, 196, 210, 215, 220–1, 432–3
 Pollution Index, 478–9
 species groups, 372
 types, 221
– rock type, 242
 and landscape, rivers and vegetation associated with, 241–9
 mixed, 247–8
– species distribution, 187–8, 189, 372, 409, 410

Index

505

- vegetation changes during a decade, 205–17
- vegetation determinants, 8
- waterway systems, 248–9, 406, 408–12
 - comparisons to continental systems, 406
 - revitalisation, 406, 408
 - species changes at sites in, 409, 410
 - species distribution at sites in, 409
- Brittany, watercourses, 321–2
- Broads
 - management plan, 430–1
 - Man's effect, 430
- brooks, drying, 216
- Bryophytes, pollution monitoring employing, 469, 482–3
- Butomus umbellatus*, 166, 170, 185, 390
- calcareous watercourses, *see* chalk watercourses
- Callitriche*, 9, 11, 24, 42, 72, 75, 76, 77, 101, 153, 162, 166, 170, 181, 185, 196, 204, 211, 214, 223, 224–6, 253, 254, 255, 270, 271, 281, 282, 290, 300, 309–10, 311, 312, 314, 317, 335, 336, 343, 355, 376, 378, 390, 391, 450, 455, 452
 - *C. hamulata*, 235
- Caltha palustris*, 170, 236, 310
- canals, *see* waterways
- Carex*, 170, 183, 184, 358
 - *C. acutiformis*, 179
 - *C. gracilis*, 179
- Carrara marble streams, 338
- catchment areas, precipitation–discharge relationships in, 55, 56
- Cation numbers
 - Colour bands related to, 138–9, 143, 153
 - of different watercourse types, 160, 161
- Ceratophyllum*, 324
 - *C. demersum*, 74, 76, 154, 155, 170, 183
- chalk (calcareous) watercourses (and associated vegetation), 211, 241–3, 256, 259, 274, 310–14, 392
- channels, *see* watercourses
- channelling and dredging, 423–5
 - areas requiring, 424
 - effects of, 192, 197, 423–5
 - excavation-, 197
 - maintenance-, 197, 423
- Channel Type Index, 417
- Chelmer, R., 215, 223
- chemical factors, *see also* nutrients
 - Colour bands associated with, 138–9
 - species grouping related to, 109–11
- chemical pollution, *see* pollution
- Chew, R., 221, 223
- χ^2 analysis of species distribution, 172, 173, 386–93
 - and habitat factor relationships, 73–5, 100, 101, 102, 103
- chloride effects, 458–9
- Cladium mariscus*, 54
- Cladophora*, 181, 185, 433
- classification factors
 - biotic, 25–44
 - macrophytic, 25–44
 - phyto-sociological, 364–75
 - plant, 25–7, 386–8
 - river, *see* rivers and streams
- clays
 - alluvial, 341
 - plant community characteristics, 378, 385–6
 - plant responses to, 162–3
 - sand rivers and streams, 270–1
 - watercourses (and associated vegetation), 211, 246–7, 270–1, 293, 302–6, 316, 331, 341, 393
- climate, 49–55
 - river discharge in relation to, 55–9
- Clostridium perfringens*, 168
- Coal Measures streams, 247, 293–4
- coastal plain channels, 274–5, 278, 324–5
- Colour band(s), 248, 317, 388–9
 - description of, 112
- diagrams of community characteristics employing, 394–405
- of different countries, 111, 114–36, 155, 156
- for different stream types, 45
- difficulties, 155–8
- example habitats of different, 111
- land use, effects on, 158, 404
- nutrient status of different, 111
- plant categories, 113
- rock type in relation to, 113–38
- shifts, 143, 403
- species lists showing, 114–18, 122–36, 248
- species lists showing effectiveness of, 112, 119–22
- species order, 112–13
- species variation in, between countries, 155, 156
- species with wide ranging, 154
- system, 111–13
- communities, plant, 361–405
 - definition/defining, 361, 386
 - geographical trends in, 375–9
 - naming, Colour banding enabling, 113
 - in specific countries, *see specific countries*
 - structure and patterns, 379
 - 3-D diagrams of main characteristics, 394–405
 - type, 380, 385
- core species, *see* species
- Corsica
 - landscape, 344, 347
 - land use, 351
 - plant communities in, 347, 351–3
 - plant habitat groups in, distribution, 353, 354
 - plant species predominant, 353–4
 - rivers and streams
 - maps, 237
 - types, 351, 352–3
 - rock types, 344, 347
 - and landscape, rivers and vegetation associated with, 351–3
 - vegetation determinants, 9
- Course, R., 235, 236
- Cover-Diversity number, 44–9
 - diagrams of community characteristics employing, 394–405
 - for different countries, 45–6
 - landscape type related to, 45, 47–8
 - management effects on, 48–9, 404
 - stream type related to, 45–6, 47–8
- Cupularia viscosa*, 352
- cutting (of vegetation), 425–7
- Cyperus*, 238, 341, 348
- damage (to watercourses)
 - boats causing, 407, 410–11
 - chemical, *see* pollution
 - community characteristics in areas of, 399
 - definition, 432
 - indices/ratings, 474–83
 - comparisons, 480–3
 - tolerant species, 448
- Dart, R., 220, 221–2
- Denmark
 - drainage patterns, 32, 425
 - habitat group distributions, 187
 - landscape, lowland, 267, 268
 - land use, 269
 - plant communities in, 267–75
 - pollution, 438, 444, 445, 449, 450, 469–70, 472–3
 - precipitation, 52
 - rivers and streams
 - discharge patterns, 61, 65, 66
 - management, 32, 424
 - maps, 227–9, 438
 - types, 270–5
 - rock types, 268–9
 - rivers and vegetation associated with, 270–5
 - species distribution, factors affecting, 186–7, 449, 450

Index

506

- Denmark (*cont.*)
- species grouping by Colour banding, 116–19, 153
 - species list showing effectiveness of Colour banding, 119–21
 - star diagrams of nutrient regimes, 142
 - vegetation determinants, 7
- depth, river, *see* rivers and streams
- detergent effects, 457–8
- determinants of vegetation, 5–10
- development of watercourses, 10–22
- geological, 10–13
 - prehistorical and historical, 13–17
- diatom
- classification, 27
 - pollution index, 482, 483
- discharge, river, *see* flow
- dissected plateau, 29, 43, 264–5
- distribution, plant
- climatological effects on, 54–5
 - histogram analysis, 70–5
 - random, probability of, 173
 - species, *see* species distribution
- ditches, *see* dykes, drains and ditches
- diversity
- -cover number, *see* Cover-Diversity number
 - species, *see* species
- Don, R. (France), 234, 236
- Don, R. (Scotland), pollution monitoring, 480–2
- Donau, R., 225, 226–7
- downstream
- changes, 218–39, 270
 - canalisation effects, 407
 - landscape effects, 47–8
 - pollution-associated, 391–2, 456
 - in species patterns, 291, 293, 391–2
 - self-purification, 432–42
- drain(s), *see* dykes, drains and ditches
- drainage, 17–22, 197–8, 286, 428, 429
- channels, 200–1
 - species dominating, 173
 - and irrigation (improvement) schemes, 197, 198, 200–2
 - order, 24
 - patterns, 67–8, 425
 - alteration to, 68, 197–8
 - of specific countries, 30–7, 197–8
 - types, 67, 68
 - pumps, 20
 - technology, spread, 20
- dredging, *see* channelling and dredging
- Drenthe, 301, 302
- Drosera*, 111
- drought in Britain (1976), 211–16
- dykes, drains and ditches, 22, 161, 202
- Damage Rating, 479, 480
 - flood hazards, 414–19
 - loss, 202
 - effects, 203
 - patterns, 39
 - species in, 203, 331–2
 - Colour banding of, 149
 - damage-tolerant, 448
 - factors affecting, 203, 248–9, 260
 - nutrient status, 162, 166
 - patterns, 331–2
 - of specific countries, 248–9, 260, 278, 297, 309, 331–5
 - summer-dry, 299
 - water pasture, 199
- dystrophic habitats, species of, 185
- ecology, of rivers, 5
- Elodea*, 7, 369, 373
- *E. canadensis*, 11, 24, 76–7, 170, 180, 183, 231, 244, 281, 300, 378, 382, 433, 458, 464, 465
- embankments, *see* banks
- Emilia Romagna, 342
- Enteromorpha*, 103, 181, 185, 186, 361, 447–8
- environment, *see also* habitat
- glacial, 12
 - pollution, impact on, 472–4
- Epilobium hirsutum*, 170
- Equisetum*, 155, 344, 373
- Erns Blanc, R., 231
- Erns Noire, R., 231
- erosion, 59–60
- eutrophication
- ambiguity in meaning of, 468
 - downstream, effects of, 139, 169, 468
 - pollution by, 468
- eutrophic habitats, 111, 183–5
- eutrophic moraine watercourses, 257
- Fagus*, 5
- faithfulness, species, 384
- farming, processes creating ground for, 202–3
- fauna, *see* animal
- fish, weed control by, 427
- fish farms, pollution by, 471
- floods
- deliberate, 63
 - dyke-, 414–19
 - protection, 14, 15
 - regimes dependent on, 61–3
 - storm, 64–5
- flow (discharge), 24–5, 55–68
- blockage, problems caused by, 414–19
 - controls, 193–6
 - drought effects, 215
 - patterns
 - changes (twentieth century), 191–2
 - regional, 60, 61, 62, 63, 64–7
 - seasonal, 53, 56–9, 60, 61, 62, 63
 - species distribution related to, 68, 71, 75
 - in all countries, 79–80
 - in different countries, 89–90, 100–3, 351
 - storm, *see* storm
- fluvial sands, 268, 273–4
- France, *see also* Corsica
- drainage patterns, 19, 20, 32–3, 425
 - hydrographic areas, 66
 - landscape, 306–8
 - plant communities in, 306–26
 - pollution, 438–9, 444, 452, 453–4, 473
 - post-flood water levels, 64
 - precipitation and its effects, 53
 - rivers and streams, 378
 - discharges, 59, 63, 66
 - management, 429
 - maps, 232–7, 439–40
 - types, 310–26
 - rock types, 306–7, 308
 - Colour band associations with, 137
 - and landscape, rivers and vegetation associated with, 310–26
 - species distribution, factors determining, 388–92, 452
 - species grouping by Colour banding, 133–6, 154
 - star diagrams of nutrient regimes, 144–5
 - vegetation determinants, 8–9
- Friedberger, R., pollution studies, 455–6, 459, 460
- Friesland, 300, 301–2
- Fringing vegetation
- distribution
 - over EEC, 177–83
 - within countries, 182
 - group habitat associations, 385
 - protective effects, 409–12
- Garigue streams, 342
- Gelderland, 300, 304

Index

Geographical Rarity Number, 297–8, 413–14
 geographic distribution, 170–89
 geographic zones, EEC, 172–3
 geology, river, 11–12, *see also* rock types
 – river discharge in relation to, 55–9
 Germany
 – drainage patterns, 34–5, 65–6, 425
 – habitat group distributions, 188
 – human interference effects, 402
 – landscape type, 249, 256
 – plant communities in, 249–67
 – pollution, 435–8, 444, 445–6, 450–1, 455–61, 473
 – precipitation patterns, 34–5, 65–6, 425
 – rivers, 376, 378
 maps, 224–7, 435–7
 types, 252–67
 – rock types, 250–2
 and landscape, rivers and vegetation associated with, 252–67
 – species distribution in, 188–9, 450–1
 – species grouping by Colour banding, 127–31, 153
 – star diagrams of nutrient regimes, 146–7
 – vegetation determinants, 8
 Gironde-Les Landes watercourses, 320–1
 glaciations, quaternary, 12–13
Glyceria, 104, 170, 176, 219, 236, 265, 272, 282, 296, 309
 – *G. maxima*, 73, 77, 100, 179, 183, 184, 185, 191, 272, 298, 390, 408, 480, 481
 Golo, R., 237
 gorge streams, 284, 423
 Gravona, R., 237
 grazing effects, 427–8
Groenlandia densa, 103, 155, 170, 227, 310, 389, 390, 391, 458
 Groningen, 301, 302, 304
 groundwater effects, 414
 Guden, R., 228, 229, 271

habitat
 – associations of core species, 384
 – eutrophic, 111, 183–5
 – factors
 distribution of, which reduce vegetation, 176
 species distribution related to, *see* species distribution
 species tolerance range, 70–5
 – group-, association of core species, 384
 – man-made effects, 15, 413, 423–4, 430
 – species grouping by, 6
 Hainault, 282
 hardness, water, *see* water
 heavy metal effects, 458, 459, 468–70
 herbicides
 – effects, 412–14, 470
 species specificity, 412
 hill watercourses, *see* mountains, uplands and hills
Hippuris vulgaris, 113, 155, 170, 227
 Holland, *see* Netherlands
Hottonia palustris, 170
 human, *see* Man
 hydraulic engineering, 19–20
Hydrilla, 168
Hydrocharis morsus-ranae, 155, 170, 369
 Hydrocharition, 373
 hydroelectric power, 16
 hydrographs of maximum/minimum flows, 58, 66

Ijser, R., pollution, 453–4
 IJsselmeer polders, 202
 invertebrate indices of pollution, 480–2
 Ireland, 52, 363
 – bogs, 286
 – drainage patterns, 35
 – landscape, 287
 – land use, 286
 – plant communities, 286–94

507

– pollution, 438, 444, 445, 473
 – rivers and streams, 376
 discharge patterns, 62, 65
 maps, 232
 types, 288–94, 438
 – rock type, 288
 and landscape, rivers and vegetation associated with, 288–94
 – species Colour banding, 114–15
 – star diagrams of nutrient regimes, 148
 – vegetation determinants, 8
 Iron Age, 14
 irrigation schemes, 200–2
Iris pseudacorus, 155, 170, 179, 183, 184, 289, 309, 311, 383, 390, 391, 466
 Italy
 – drainage patterns, 36–7, 425
 – dykes and drains, 331–5, 338, 339–46, 452–3
 – habitat group distributions, 186
 – landscape, 327, 328
 – land use, 330
 – plant communities, 327–44
 hill, 385–6
 north–south variations in, 343, 344
 – pollution, 331–2, 441, 444, 446, 451–2, 452–3
 – precipitation and its effects, 54
 – reclamation, 200
 – rivers and streams
 discharge patterns, 62, 66–7
 maps, 238–9, 441
 types, 331–44
 – rock types, 327, 328
 and landscape, rivers and vegetation associated with, 331–44
 – species distribution, factors affecting, 102, 186, 451–2, 452–3
 – species grouping by Colour banding, 122, 153–4
 – star diagrams of nutrient regimes in, 150–1
 – vegetation determinants, 9–10
 Itchen, R., 221, 223

Jagst, R., 225, 227
Juncus, 162
 – *J. bulbosus*, 105
 – *J. effusus*, 237, 353, 354
 Jutland
 – mining, effects, 469
 – rivers, 268
 species and habitat group distributions, 186–7
 star diagrams of nutrient regimes, 142

key species, 380
 Kinzig, R., 224–6, 265

La Hantes, R., 229, 230
 lake, reclaimed, 20
 land
 – reclamation, 17–27, 190, 200
 – tenure, 428
 landscape
 – categories, 42–3
 effect on aquatic macrophytes, 43–4
 – effects, 43–8
 of modification, 42
 – of specific countries, *see specific countries*
 – symbols used in maps of, 241
 – trees and their importance to, 420, 421, 422
 – types/features
 Cover-Diversity number related to, 45–6, 47
 river types related to, 28, 29
 species distribution determined by, 386, 387, 388–90
 vegetation classification by, 29
 land use, *see* management
 Languedoc, drainage and irrigation schemes, 201
 Lark, R., 193, 211
 Latina plain dykes and drains, 339–40

Index

508

- Lemna*, 54, 55, 170, 185, 204, 369
 – *L. gibba*, 170, 216
 – *L. minor*, 70, 77, 185, 216, 306, 466
 – *L. trisulca*, 170
 Leze, R., 234
 Ligura watercourses, 337–8
 Limburg, 300
 lime-influenced/rich watercourses, 335–6, 340–1
 limestone
 – community characteristics, 375–8, 385
 – Jurassic, 310, 392
 – plant responses to, 162
 – species associated with, 177, 375–8, 392
 – streams, 375–8
 species comparisons to Resistant rock streams, 291, 292
 of specific countries, 241–3, 244, 250, 252–6, 288–91, 310–15, 350, 392
 Lippe, R., 226, 227
 Loire, R., discharge patterns, 66, 67
 Low countries, drainage, 17, 18, *see also specific countries*
 Lude, R., 229
 Lüneberger Heide streams
 – site records, 362
 – vegetation associated with, 34, 261–2
 Luxembourg
 – drainage patterns, 37
 – landscape, 284
 – plant communities, 283–5
 – pollution, 435, 445, 473
 – rivers and streams
 maps, 231, 435
 types, 285
 – rock types, 283, 284
 and landscape, rivers and vegetation associated with, 285
 – species distribution, habitat factors affecting, 100
 – species grouping by Colour banding, 124–6, 153
 – vegetation determinants, 7
 Maas, R., *see* Meuse, R.
 macrophytes (EEC), 5, 6
 – distribution, 170–1, 456, 457, 459, 460
 drainage order, relation to, 24
 drought, effects of, 216
 – pollution monitoring employing, 494–5
 comparisons with other methods, 480–2
 suitable landscapes for, 475–6
 – pollution reduction mediated by, 465–7
 Man, effect of, on rivers and land, 175–7, 190–203, 430–1
 – accidental, 4, 13–22
 – deliberate, *see* management
 – diagrams showing effect on vegetation, 394, 401–3
 management (river and land), 14–22, 42, 68, 405–31, *see also specific types of management*
 – Colour bands in areas of, 158, 404
 – Cover-Diversity number affected by, 48–9, 404
 – general, 429–31
 – recent changes in, 190–203
 – species diversity and, 362–4
 – systems, 424–5
 Manning's equation, 415–16
 maps, river
 – book list, 484
 – of specific countries, *see specific countries*
 marble, Carrara, streams, 338
 marshes and bogs
 – drainage, 19, 286
 – Irish, 286
 Massif Central, 307
 – streams, 319, 322–3
 Meese, R., 221, 223
Mentha aquatica, 77, 170, 178, 182, 237, 391
Menyanthes trifoliata, 170
 metals, heavy, effects, 458, 459, 468–70
 Meuse (Maas), R., 294
 – tributaries, 282
 mills, 191, 193–5
 – effects on flow, 194
 – paper-, 480
Mimulus guttatus, 155, 171, 178, 182
 Miocene sands, 319
 Molinee, R., 229, 230
 monocotyledons, tall, 385
 – distribution, 179–80, 183, 184
 Moosach, R., pollution studies, 455, 456, 457, 466
 moraine sands, 268, 271–2, 318, 325–6
 morphology, pollution effects, 462–4, 465
 mountains, uplands and hills
 – building, 11–12
 – climate, 49–50
 – Cover-Diversity numbers, 48
 – ranges, 1, 2
 – rivers and streams
 diagrams of community characteristics, 398–400
 of specific countries, 246, 247, 252–6, 263–6, 281–3, 285, 290–1, 292, 293, 306–7, 314–15, 316, 317–20, 322–4, 335, 352–3, 357–8, 359–60
 Muschelkalk watercourses, 258–9, 315–16
Myosotis scorpioides, 77, 171, 178, 182, 462, 464
Myriophyllum, 171, 218
 – *M. alterniflorum*, 274, 458
 – *M. spicatum*, 11, 110, 155, 167, 183, 221, 414, 464, 472
 Naab, R., pollution studies, 458
 Nagold, R., 224, 226
 Navaccia, R., 237
 navigation, 191, 192–3, *see also* boats; waterways
 Nete, R., 229, 230
 Netherlands (The), 52–3, 202, 388
 – canal sites, damaged, species characteristic of, 410
 – Colour banding, 153
 – drainage
 effects, 17, 18, 202
 patterns, 39, 425
 – herbicide use, 413
 – landscape, 294, 295
 – land use, 295–6, 297
 – plant communities in, 294–306
 – pollution, 297, 445, 446, 451, 452, 473
 – provinces, 299, 300–6
 – species associations, 376
 – species distribution, 451, 452
 habitat factors affecting, 102
 boat effects on, 407–8
 – star diagrams of nutrient regimes, 152
 – subsoil types, 296
 watercourses associated with, 299–306
 – vegetation determinants, 7
 – watercourses, types, 294–5, 299–306
 neutral moraine rivers and streams, 257
 Noord Brabant, 300, 304
 Noord Holland, 304
 Norway, south
 – landscape, 356
 – land use, 356
 – plant communities, 356
 – pollution effects, 444, 445, 449
 – rock types, 356
 – species distribution, 358–9
 factors affecting, 103, 449
 – species grouping by Colour banding, 132, 154
 – vegetation determinants, 5–7
 – watercourses
 nutrient status, habitat factors affecting, 356
 types, 357–8
Nuphar lutea, 24, 70, 71, 76, 77, 104, 171, 180, 183–4, 195, 211, 216, 310, 416, 417, 438, 448
 nutrient (trophic) regime/status, 29, 108–59

Index

509

- banding schemes, 109–11
- Colour-, *see* Colour band(s)
- diagrams of community characteristics employing, 394–405
- of pollution-related communities, 464–5
- species grouping by, 5, 41, 384
- star diagrams of, 138
 - for different habitats in various countries, 140–2, 144–52
 - for different species, 163–7
 - for polluted sites, 465
 - scale bars for, 138
 - size number for, 139, 143
- nutrient(s) (general features)
 - analysis, 138, 167
 - relations in sediments, 168
 - status, *see* nutrient regime
 - uptake and accumulation, 167
 - water relations, 168–9
- Nymphaea alba*, 416

- Oberpfalz watercourses, vegetation associated with, 266
- obstructions, problems caused by plant, 414–19
- ochre streams, Danish, 469–70
- Oenanthe*, 171
 - *O. crocata*, 72, 74, 75, 101, 103, 169, 171, 236, 247, 289, 290, 292, 351
- Oker region vegetation, 369
- oligotrophic habitats, 111
 - species of, 185
- Oolite streams, 243
- Orb, R., 235, 237
- organic chemical pollution, 459, 467, 470–1, 480–2
- Osmunda regalis*, 9, 72, 105, 237, 347, 353, 354
- Ostfold, plant communities in, 360–1
- Ost Friesland, 254, 260
- Ourthe, R., 230, 231
- Overijssel, 301, 304–5
- Oykel, R., 220, 221

- paper mill pollution monitoring, 480
- peat
 - areas, 296–7
 - effects, 139
 - watercourses, 301–2
 - acid-, 291
- Perpignan, 319, 440
- Perry, R., pollution studies, 454–5, 456
- Petasites hybridus*, 71, 171, 185, 198, 234, 236, 265, 282–3, 341, 342, 350, 389, 390
- Pfalzer, rivers and streams, vegetation associated with, 263
- Phalaris arundinacea*, 42, 69, 71, 72, 73, 77, 100, 101, 107, 153, 171, 172, 179, 183, 184, 205, 208, 221, 234, 236, 247, 253, 264, 265, 279, 281, 285, 289, 311, 387, 426, 433, 435, 439, 440
- phosphate, effects, 459, 461
- photosynthesis, chemicals affecting, 457, 458, 459
- Phragmites*, 10, 173, 425
 - *P. communis*, 71, 73, 77–8, 100, 103, 104, 105, 168, 171, 173, 174, 175, 180, 183, 184, 229, 263, 278, 298, 303, 330–1, 334, 335, 336, 339, 343, 344, 346, 350, 351, 352, 358, 407, 411, 413, 451, 464, 466
- physical factors determining species distribution, *see* habitat
- physiography
 - of the EEC, 1–5
 - river discharges in relation to, 55–9
- phyto-sociological classification, 364–75
 - of aquatic and marginal vegetation, 370
- Piedmont streams, 336–7
- Pisa plain dykes and drains, 338
- plains, *see* alluvium; coastal plain channels; plateau
- plants, *see also* macrophytes; species; vegetation
 - classification, 25–7, 386–8
 - communities, *see* communities
 - distribution, *see* distribution
 - pollution indices, 482–3
- plateau, dissected, 29, 43, 264–5
- Po, R., plain, 330, 441

- channels, 330–6
- polders, 202, 304
- pollution (chemical), 4, 176, *see also* damage
 - aspects of, 462–74
 - changes with time, 442–4, 454–6
 - definitions, 4, 431–2
 - degradation/self-purification, 432–42, 465–7
 - high level, 44
 - indices, 474–6, 478–9
 - comparisons, 480–3
 - long-distance, 432–42
 - monitoring, 468–9, 494–5
 - morphological effects of, 462–4, 465
 - organic, 459, 467, 470–1, 480–2
 - patterns, 431–61
 - recovery from
 - with space, 432–42
 - with time, 442–4
 - river maps, 432–42, 484
 - sources, 467–72
 - by specific chemicals, responses, 457–61
 - of specific countries, 297, 331–2, 432–42, 444
 - non-EEC, 442, 473–4
 - status of rivers, changes in, 443
 - tolerant species, 446–53, 461
 - classification, 446–7
 - relationship to site diversity, 448–53
 - types of, 432
 - vegetation changes, 4–5, 208, 211, 402, 403
 - of waterways, 22
- Polygonum*, 171, 435
 - *P. amphibium*, 78, 171
 - *P. hydropiper*, 388
- Potamogeton*, 54, 78, 171, 218, 229, 290, 300, 312, 335, 369, 376, 384, 436, 437, 458, 459, 460, 473
 - *P. alpinus*, 153, 155
 - *P. coloratus*, 456, 461
 - *P. crispus*, 155, 184, 261, 389
 - *P. lucens*, 459–61
 - *P. natans*, 155, 246, 300, 416
 - *P. nodosus*, 448, 473
 - *P. pectinatus*, 70, 169, 181, 184, 249, 389, 433, 434, 435, 438, 441, 442, 444, 454, 464, 465, 469
- precipitation
 - acid, 472
 - decline, effects, 210, 213
 - effects, *see also* floods
 - on macrophytes, 44
 - on river discharges, 55–9
 - rock type influences on, 52
 - heavy/prolonged, *see* storm
 - map for W. Europe, 50, 51
 - monthly maximum/minimum/mean, 50
 - regimes, 50, 51, 52–4
 - seasons of maximum, 52
 - variations, regional, 52–4, 191
- Pyrenees, 307
 - outwash region, 318, 319

- quarries, pollution by, 471
- quaternary glaciation and deposits, 12–13

- rainfall, *see* precipitation
- Ranunculus*, 7, 11, 24, 30, 42, 70, 71, 73, 74, 78, 100, 101, 103, 105, 110, 162, 164, 171, 181, 185, 193, 195, 196, 197, 204, 206, 214, 219, 221, 222, 226, 229, 231, 234, 236, 238, 241, 244, 253, 261, 265, 266, 269, 271, 278, 279, 281, 282, 283, 289, 290, 300, 309–10, 311, 312, 314, 335, 336, 350, 376, 378, 379, 382, 391, 435, 454, 463–4
 - *R. calcareus*, 168, 243
 - *R. fluitans*, 76, 215, 454, 456, 468
- reclamation, *see* land
- relevé, 365

Index

- reservoirs
- regulating, 195
 - uses and effects, 195–6, 208, 212
- Resistant rocks, 160–1
- community characteristics, 385–6
 - plant responses to, 160–1
 - watercourses, 378, 404
 - and associated vegetation, 247, 256, 259, 264–7, 281, 285, 291, 321–4, 340–2, 350, 352–3, 393
 - species comparisons to limestone watercourses, 291, 292
- Rheidol, R., reservoir effects, 195–6
- Rhône, R.
- channel changes, 16
 - delta, watercourses, 325
 - drainage and irrigation schemes, 201
- Ribe, R., 228, 229
- Riccia fluitans*, 373
- rice paddies, 336
- pollution by, 336, 471
- rivers and streams, *see also specific rivers and water*; watercourses; waterways
- banks, *see* banks
 - blockage, vegetation causing, 415
 - channel parameters (physical), 392, *see also specific parameters*
 - cleanliness, 4
 - controls, 193–6
 - Damage Rating, 476–8
 - depth
 - changes during drought, 215
 - range, 39
 - species distribution in relation to, 70, 83–4, 94–5, 104–5
 - description, complete of entire length, 379–80
 - development, *see* development of watercourses
 - divisioning/sectioning, 23–4
 - drainage, *see* drainage
 - drying, 216
 - flow/discharge, *see* flow
 - geology, *see* geology
 - hydraulic problems, 15
 - management, *see* management
 - maps, 196, 210, 212, 215, 219–39, 432–42, 484
 - non-EEC, 380, *see also* Norway
 - plants, *see* macrophytes; plants; vegetation
 - pollution, *see* pollution
 - precipitation effects, 52–4
 - principal EEC, 2–4
 - profiles, 23–4
 - rock types, *see* rock types
 - sediment, *see* sediment
 - size/width, *see* size
 - slope, 43, 357
 - straightening, 194, 197–8
 - substrate, *see* substrate
 - systems, 10–11
 - alterations to, 13–22, 190–203
 - penned, 198–200
 - turbidity, species distribution in relation to, 70, 75, 77, 87–8, 98–9, 106–7
 - types/classes, 23–49, 219–21, 224, 227, 229, 231, 232, 233, *see also* size
 - Colour bands, 143
 - hardness ratios, 138
 - uses, 191–203
- roads, effects, 203
- rock (general features)
- erosion, 59–60
 - types, *see* rock types
- rock types, 45–6, 57, 159–63, *see also specific rock types*
- Colour bands associated with, 113–38
 - diagrams of community characteristics employing, 395–405
 - effects, 38
 - on nutrient patterns, 163
 - on precipitation effects, 52
 - on species distribution, 100, 101, 102, 159–63, 368, 387, 388–9, 390–2, 405
 - principal EEC, 3, 4
 - river classification by, 223–4
 - river and stream types in different categories of, 28, 29, 40
 - of specific countries, *see specific countries*
 - vegetation classification by, 29, 38–9
 - water capacity, 56
 - root development, pollution effects, 42–3
- Rorippa*, 154, 171, 274, 336, 391
- *R. amphibia*, 462
 - *R. nasturtium-aquaticum*, 72, 73, 75, 78, 100, 182–3, 196, 204, 241, 244, 283, 342
- Roya, R., 233
- Rumex hydrolapathum*, 171
- Sagittaria sagittifolia*, 24, 78, 171, 184–5, 216
- Salix*, 268, 347
- *S. elaeagnos*, 9, 237, 347, 353
- salt pan channels, 342
- sandstones, 161–2
- community characteristics, 378, 385
 - fertile, highly, 317
 - plant responses to, 161–2
 - watercourses, 378, 404
 - vegetation associated with, 243–6, 261, 263, 281, 285, 292–3, 316–22, 352, 392
- sand streams, 278–80, 299–301, 352
- acid, 243, 279, 280–1, 320, 321, 393
 - alluvial plain, *see* alluvium
 - fluvial, 268, 273–4
 - moraine, 268, 271–2, 318, 325–6
- Sardinia
- landscape, 344, 346
 - plant communities in, 350–1
 - plant species predominant in, 354–5
 - pollution, 442
 - river maps, 238, 442
 - rock types, 344, 346
 - and landscape, rivers and vegetation associated with, 350–1
 - vegetation determinants, 9
 - water flow, species associated with, 351
- Sasslach, R., 226, 227
- Sauldre, R., 235, 236–7
- Schleswig Holstein, watercourses, 262–3
- Schwarzwald, rivers and streams, vegetation associated with, 264
- Scirpus*, 332
- *S. lacustris*, 11, 24, 42, 73, 78, 104, 154, 185, 216, 466
 - *S. maritimus*, 75, 103, 201
- seasonal aspects of river flow, 53, 56, 59, 60, 61, 62, 63
- sediment, river, *see also* substrate
- analysis, 61–2
 - load/content, 59–63
 - nutrient relations in, 168
 - production, 168
- Sée, R., 234–5
- Sele, R., 238, 239
- Semois, R., 230
- Sempt, R., 225, 227, 455
- Severn, R., discharge pattern, 58, 65
- sewage pollution, 5, 467–8
- effects, 463
 - treatment, 466, 467
- shading, 420–3
- ecological balance, 421
 - optimum, considerations, 422–3
- shoots, pollution effects, 463–4
- Sicily
- drainage patterns, 36
 - landscape, 344, 345
 - plant communities in, 348–50
 - pollution, 441–2

Index

- rivers and streams
 - maps, 238, 442
 - types, 348–9
- rock type, 344, 345
 - and landscape, rivers and vegetation associated with, 348–50
- species predominant in, 354–5
- vegetation determinants, 9
- silt
 - effects, 139
 - uses, 198
- site record, 361, 362, 363
- size (including width), river, 26–7, 28, 39–42
 - Colour band for different, 45–6
 - Cover, diversity, related to, 219, 364, 366, 368
 - species distribution in relation to, 70, 74, 77, 381–4, 386, 387–8, 389–91
 - core-, 381–4
 - in all countries, 85–6
 - in different countries, 96–7, 105–6
- Sjaelland
 - river and stream maps, 229
 - species and habitat group distribution, 186–7
- Skjern, R., 228, 229, 274, 469
- Solanum dulcamara*, 256
- solute content of rivers, 63–4
- Somerset Levels, vegetation classification, 369, 377
- Sparganium*, 437
 - *S. emersum*, 24, 71, 72, 77, 78, 101, 104, 153, 154, 155, 164, 171, 180, 184, 195, 214, 216, 254, 269, 273, 280, 281, 336, 378, 391, 426, 436, 438, 454
 - *S. erectum*, 42, 72, 74, 78, 104, 154, 157, 171, 180, 183, 184, 206, 207, 208, 215, 216, 226, 236, 245, 246, 271, 272, 273, 280, 289, 298, 311, 339, 359, 382, 407, 408, 409, 424, 433
- spates, man-effected, 195
- species (general features)
 - channel blockage capacity, 418
 - characteristic, 380
 - distribution of, 385
 - Colour banding, *see* Colour banding
 - from common and diagnostic communities, 5, 6
 - composition, changes in, 205–11, 216
 - core, 380–6
 - group habitat associations, 384–6
 - habitat associations, 384
 - distribution, *see* species distribution
 - diversity, 361–4
 - changes, 205, 208, 213, 219, 408
 - in different countries, 364, 366
 - herbicide effects, 413
 - pollutant effects, 444–6
 - pollution-tolerant species in relation to sites of high/low, 448–53
 - dominant indicator, 374–5
 - gains and losses, causes, 206–7
 - geographical aspects, 170–89
 - groups/assemblages
 - distribution, factors associated with, 38, 41, 291, 293
 - downstream effects, 169
 - nutrient patterns associated with, 167
 - wide ranging, 154–5
 - key, 380
 - numbers associated/not associated with river habitat factors, 104
 - nutrient patterns of different, 163–7
 - nutrient status, *see* nutrient regime
 - retentiveness, 205, 210, 213
 - stability, relative, 209
 - tolerance to habitat factors, 70–5, *see also* pollution
- species distribution
 - damage tolerant *vs.* non-tolerant, 449–53
 - interpretation by statistical analysis, *see* χ^2 analysis
 - physical (habitat) factors related to, 68–108, 386–8
 - in all countries, 75–8
 - in different countries, 78–107
 - river size associated with, 47
 - waterway effects on, 407
 - within countries, 186–9
 - within EEC, 170–86
 - variations in different countries, 76, 77
- Sphagnum*, 17
- Spirodela polyrhiza*, 54
- Staffora, R., 238, 239
- star diagrams, *see* nutrient regime
- storm
 - flooding, 64–5
 - flow, 64, 215
 - timing, 64
- Stour, R., 208, 210
- Stratiotes aloides*, 297
- streams, *see* rivers and streams
- Structural Evaluation Number, 297–8, 413–14
- subsoil
 - effects on species distribution, 102
 - type, communities classified on, 294–306
- substrate, *see also* sediment
 - rock type effects on, 38
 - species distribution related to, 69, 76
 - in all countries, 81–2
 - in different countries, 91–3, 103–4
- Syr, R., 231
- Tamarix gallica*, 9
- Tanaro, R., 238, 239
- temperature regimes, 49–50
- Tern, R., 194–5
- Tet, R., 233
- The Netherlands, *see* Netherlands
- Tirso, R., 238
- Tone, R., 220, 223
- Torrige, R., 220, 223
- towns and villages, effects on vegetation, 203
- transplant experiments, 456, 458
- transport, water, 191, 192–3, *see also* boats; waterways
- trophic status, *see* nutrient regime/status
- turbidity, river, species distribution in relation to, 70, 75, 77, 83, 87–8, 98–9, 106–7
- Tuscany coastal streams, 337–8
- TWINSpan classification program, 368–75
- Tyne, North, R., 208, 212
- Typha*, 78, 171, 180, 183, 184, 351, 354
 - *T. angustifolia*, 171, 351
- upland rivers and streams, *see* mountains, uplands and hills
- Utrecht, 305
- Utricularia vulgaris*, 373
- vegetation, river, *see also* macrophytes; plants; species
 - changes (in species composition), 407–12
 - annual, 210, 211
 - during 10 years, 204–17
 - in lowland river sites, 206, 207, 208
 - measurement and assessment, 205–11
 - channel quantities, acceptable, 416, 419, 427
 - classification, 364–75
 - control, *see* cutting; herbicides; shading
 - determinants, 5–10
 - plentiful/negligible, regions with, 174–7
 - pre-twentieth century, 190–1
 - quality assessment, 297–8
 - Type Index, 417–18
 - Veneto, lowland, 335
- Veronica*, 340
 - *V. anagallis-aquatica*, 178, 182, 338
 - *V. beccabunga*, 69, 74, 179, 182, 259, 383
- Vestfold, plant communities in, 359–60
- Vid, R., 470
- Vils, R., 226, 227
- Vosges mountains, watercourses, 323–4

Index

Vyrnwy, R., 220, 221

Wadden Sea, embanked areas, 20

water, *see also* rivers and streams

– hardness, 109

ratio, 109, 138, 143, 153, 160, 161, 163

– levels, post-flood, 64

– movement, *see* flow

– nutrients, 168–9

– power/force, 139

macrophyte biomass determined by, 174

macrophyte distribution determined by, 27–38

use, 14

– rights (legal), 428

– -supported species, group habitat associations, 384

– transfer schemes, effects, 196

– turbidity/clarity, species distribution in relation to, 70, 75, 77, 87–8, 98–9, 106–7

watercourses, *see also specific types*, e.g. rivers and streams; waterways

– administration of, 428–9

– alterations to, 176

– blockage, problems caused by, 414–19

– common/diagnostic species, 381

– design, 430

– recent changes in management, 190–203

– species distribution in, 177

in specific countries, *see specific countries*

validity of maps of, 171–2

water-cress beds, effects, 196

water meadows, 198–200

water table, seasonal variations, 59

512

waterways, 14–17, 18, 191, 192–3, 405–12, *see also* boats; navigation

– damaged sites, 410

– Damage Rating, 479, 481

– definition (of canals), 248

– freight volume, 17

– historical development, 14–17, 191, 192–3, 405–7

– management, 429–36

– navigable European, 16, 18

– plant communities in, 248–9

– pollution, 27

– types, 407, 408

– use(s), 4

decline in, effects, 192–3

increase in, effects, 193

– vegetation affected by, 216–17

weather, Colour band distortion by, 157

weed control, 174, 423, 427, 429–30

width, stream, *see* size

Wolffia arrhiza, 54

woods, shading effects, 422

xerotic climates, 53–4, 172, 173

Yser, R., pollution, 453–4

Zannichellia palustris, 42, 218, 349, 389, 390

Zeeland, 305

zinc, effects, 458

zonation, macrophyte, pollution associated, 460

zones, geographic, major EEC, 172–3

Zuid Holland, 305

Zurich-Montpellier system, 365, 369, 370–1