Reassessment of the Areas with the Highest Concentration of Rare Plant Species in Vladimir Oblast, Russia

Final report

by Alexey P. Seregin

Обследование территорий с высокой концентрацией редких видов во Владимирской области (Россия)

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составил А.П. Серегин

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Abstract

In 2015, we studied 34 grid squares spending 30 working days in field. We performed 430.4 km of foot trips, or 12.7 km per grid squares, or 14.3 per field day. 9,430 grid records were made for all plant species of Vladimir Oblast during field trips. They include 6,625 records (70.4 %) which confirm recent data, 418 records (4.4 %) which confirm historical records, and 2,370 new records (25.2 %). We made 126 grid records of 78 rare plant species—27 records (21%) confirm recent data, 23 records (18%) are important confirmations of historical records, and 76 grid records (61%) are new. 304 herbarium specimens were collected for rare, noteworthy or unknown plants. Final grid map of the areas with the highest concentration of rare plant species (as of January, 1 2016) is presented.

Introduction

Vladimir Oblast is situated in the centre of East European Plain ca. 100–400 km east of Moscow. It stretches ca. 190 km from north to south and ca. 290 km from west to east covering 29 084 square km. Mean January temperature is –8.5°C, mean July temperature is +18.8°C, and mean annual temperature is +4.7°C (Pogoda i klimat, 2013). Mean annual precipitation is 585 mm with the highest precipitation in summer months. Continentality is more pronounced along the eastern border of Vladimir Oblast.

Wet, acid, nutrient-poor soils are peculiar for sandy alluvial and fluvioglacial lowlands. Dry, neutral, nutrient-rich soil conditions dominate in agricultural Opolye region and areas along the major rivers. Dry, acid, nutrient-poor soils are located in axial zone of a carbonate fold covered by fluvioglacial sand and sandy loam. Wet, neutral, nutrient-rich soils cover Klin-Dmitrov Ridge, the highest upland of Vladimir Oblast reaching 271 m above sea level.

Vladimir Oblast is situated in the ecotone between boreal coniferous and temperate broadleaf (hardwood) forests. Distribution of forest types within the region is clearly determined by soil conditions. Both boreal coniferous forests dominated by *Pinus sylvestris* and *Picea abies* on various nutrient-poor substrata and temperate broadleaf forests with *Quercus robur, Tilia cordata,* and *Ulmus glabra* on loamy eutrophic soils are the main components of original (pre-man) vegetation. Other native plant communities of Vladimir Oblast are peatbogs, xeric meadows on steep slopes, and alder stands along lesser streams, as well as meadows, marshes, and willow thickets on flood plains. Currently, 29.9% of land is used for agriculture, while 55% is covered by forests (official data).

Since 1998, I have been working on the grid mapping of Vladimir Oblast flora. The region was divided into 339 cells with the linear dimensions of 5′ in latitude and 10′ in longitude (ca. 9.2 × 10.4 km) based on WGS84 datum (Fig. 1). Thus, the area of trapezoid cells (in the text also called "squares") slightly increases toward the south, ranging from 94.7 km^2 in the north of the oblast up to 98.2 km^2 in the south.

Typically, at least one complete floristic description was made in each of the 339 grid squares in the period from late May to late September (1998–2014). Prior to the field work, I outlined a route using topographical maps and satellite images of the grid square covering the highest possible diversity of habitats. Usually a floristic description of a single grid square takes one day (6–9 h, sometimes up to 12 h). I used the printed spreadsheet in a field notebook with a list of the 680 most common plants, which is about a half of the oblast flora. Rarer plants were placed at the end of the list; unclear or interesting species were collected.

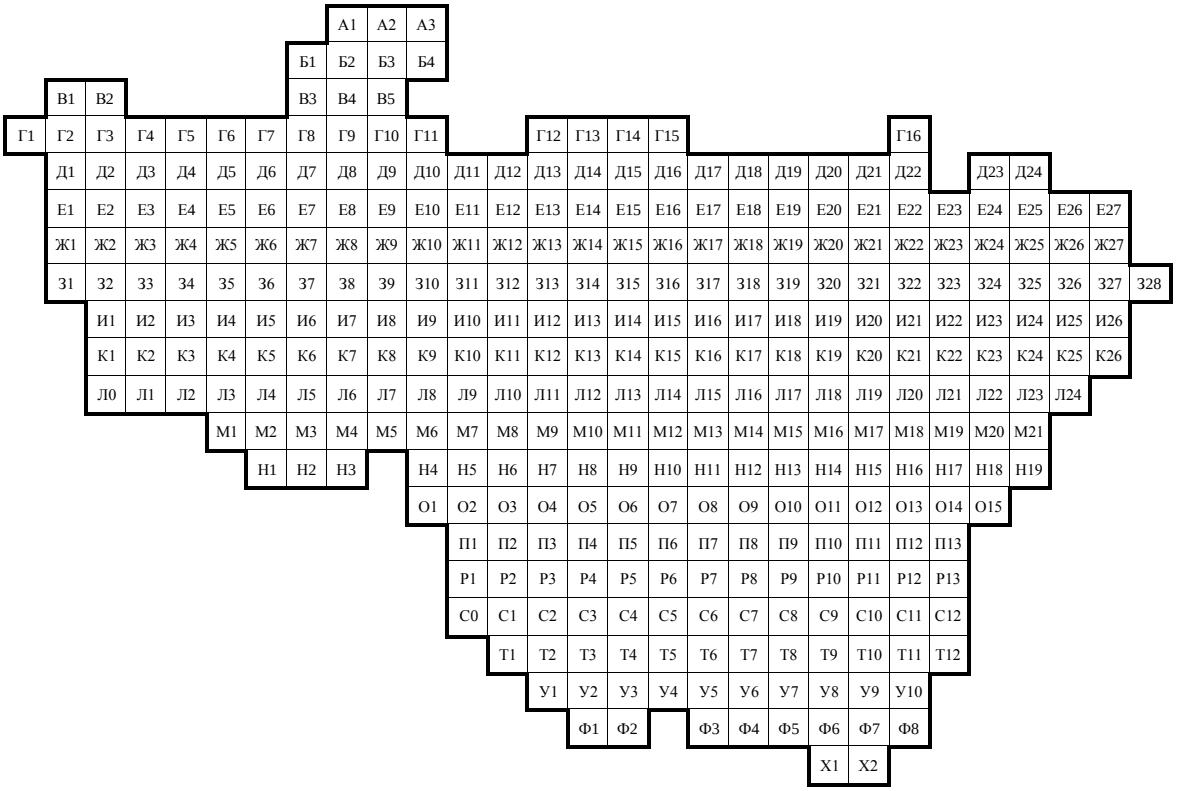


Fig. 1. Grid indexes.

I transferred the data obtained within the field season to the distributional database of Vladimir Oblast plant species in October–November annually. This database, supplemented by all available data from the literature and herbarium collections, was used to produce maps in the recently published *Flora of Vladimir Oblast* (Seregin, 2012). At the time of map production for the *Flora* in November 2011, it contained 118 231 records (in other words, the maps are based

on 118 000 entries). In 2012–2014, the grid mapping of Vladimir oblast flora was continued. Field data for the past three years contain important information on increasing number of localities of some plant species. By the end of 2014, 124 100 individual records were databased (on average, 366 species per grid square).

Analysis of database revealed—(1) a pool of rare native species, (2) lists of rare species in each grid square, and (3) ranking of squares with the highest number of rare species. One-day floristic recording performed earlier led to systematic omission of rare species. So, we planned in 2015 to focus the research on selective search of expected rare species in suitable habitats. Although this recording is highly time consuming, protection of the rarest species habitats is the top priority in local conservation efforts.

In Vladimir Oblast the areas with the highest concentration of rare species do not coincide with biodiversity hotspots. In other words, rare species have no significant contribution to the local biodiversity. On the other hand, we found that rare species often grow together in unique habitats. These basic points we put into the foundation of our field work.

Materials and methods

As "a rare species" we treated those native vascular plants which were recorded before 2015 in 1–20 grid squares within Vladimir Oblast. Alien plant species are not treated in this study. Some natives with a majority of records in Vladimir Oblast made in man-made habitats (for instance, *Myosotis sylvatica*, *Campanula rapunculoides*, *Astragalus cicer*, *Salvia verticillata*, *Potentilla reptans*, *Trifolium fragiferum*) were excluded from the analysis, although some recent records of these plants are undoubtedly native.

The aim of each day-trip was the recording of the highest possible number of all species. The squares were surveyed to find key areas—for instance, large swamps, lakes, large sinkholes, parts of river valleys or canyons, old forest massifs, or abandoned limestone quarry. Such sites were thoroughly described for further conservational decisions.

Study of flora begins with the preparation of routes using satellite images. They should link known localities of rare species and areas of potential interest. The exact route planning helps to avoid delays and fruitless searches. During the field trip we recorded species in printed spreadsheets. Plants that are difficult to identify in field were collected and pressed for herbarium. All populations of rare species were georeferenced by GPS, and a brief description was compiled. Previously known localities of rare species were revisited if the exact place was known. Track was permanently controlled by GPS.

In 2015, we studied 34 grid squares spending 30 working days in field (Table 1)—13 squares in May, five in June, eight in July and eight in August.

9,430 grid records were made for all plant species during field trips (on average, 277 species per grid square in total, and 336 species per grid square for squares studied in summer). They include 6,625 records (70.4 %) which confirm recent data of 1998–2014, 418 records (4.4 %) which confirm historical records, and ***2,370 new records (25.2 %).*** These data contributed the distributional database of plants of Vladimir Oblast.

We performed 430.4 km of foot trips, or 12.7 km per grid squares, or 14.3 per field day. The most fruitful field trip with the highest number of recorded species was performed in 10th of August near Mostostroy not far from Vladimir City.

Table 1. An outline of the fieldwork.

Date	Grid	District	Basic locations	No. of recorded species
1.5.2015	Х2	Melenkovsky District	Okshovo, Muratovo	149
1.5.2015	Ф8	Melenkovsky District	Kaznevo	131
2.5.2015	У10	Melenkovsky District	Voyutino	167
2.5.2015	Т11	Melenkovsky District	Kaznevo	71
3.5.2015	И3	Kirzhachsky District	Kirzhach	162
9.5.2015	Л4	Petushinsky District	Staroye Semenkovo	195
9.5.2015	М2	Petushinsky District	Novoye Perepechino	193
10.5.2015	Ж23	Vyaznikovsky District	Kourkovo – Stanki	196
10.5.2015	Ж22	Vyaznikovsky District	Naleskino	186
11.5.2015	Л3	Petushinsky District	Pokrov, Maslyanye Gorochki	196
23.5.2015	К8	Petushinsky District	Nergel River	232
24.5.2015	М6	Sobinsky District	Zhokhovo, Pogost	219
31.5.2015	Е1	Alexandrovsky District	Arsaki Station	274
12.6.2015	Ж11	Sobinsky District	Bukholovo	261
13.6.2015	320	Kovrovsky District	Novoye	281
14.6.2015	Д14	Suzdalsky District	Kideksha	300
21.6.2015	И25	Gorokhovetsky District	Suvoroshch River	360
22.6.2015	Ж17	Kameshkovsky District	Gorki	339
5.7.2015	С12	Muromsky District	Panfilovo	357
6.7.2015	О10	Selivanovsky District	Novoye Bibeyevo	365
12.7.2015	Е21	Vyaznikovsky District	Shustovo	381
13.7.2015	О7	Gus-Khrustalny District	Staroopokino	351
19.7.2015	Н15	Selivanovsky District	Novlyanka	375
20.7.2015	Ж15	Kameshkovsky District	Nerl River	306
26.7.2015	Е23	Vyaznikovsky District	Lake Kanstra	307
27.7.2015	Е24	Vyaznikovsky District	Lake Skipskoye	194
2.8.2015	Ж24	Vyaznikovsky District	Novo	335
3.8.2015	И23	Vyaznikovsky District	Uspensky Pogost	318
9.8.2015	Ж21	Vyaznikovsky District	Yuryshki	404
10.8.2015	К12	Vladimir City	Mostostroy	423
16.8.2015	О8	Gus-Khrustalny District	Gubtsevo	353
17.8.2015	314	Vladimir City	Lunevo	337
23.8.2015	Т9	Melenkovsky District	Ivatino, Melenki	383
24.8.2015	Р13	Muromsky District	Karacharovo	329

In 2015, we made ***126 grid records of 78 rare plant species***: 27 records (21%) confirm recent data of 2000–2014, 23 records (18%) are important confirmations of historical records, and ***76 grid records (61%) are new***. 304 herbarium specimens were collected for rare, noteworthy or unknown plants. They were transferred to the Moscow University Herbarium.

Results

Figures 2 and 3 show the actual number of rare plant species in each grid square as of end of 2014 and 2015. Both maps are looking largely the same, although 76 new grid records of rare plants were made last year in field. To compare these maps one should look on Fig. 4, where the difference between grid numbers is shown.

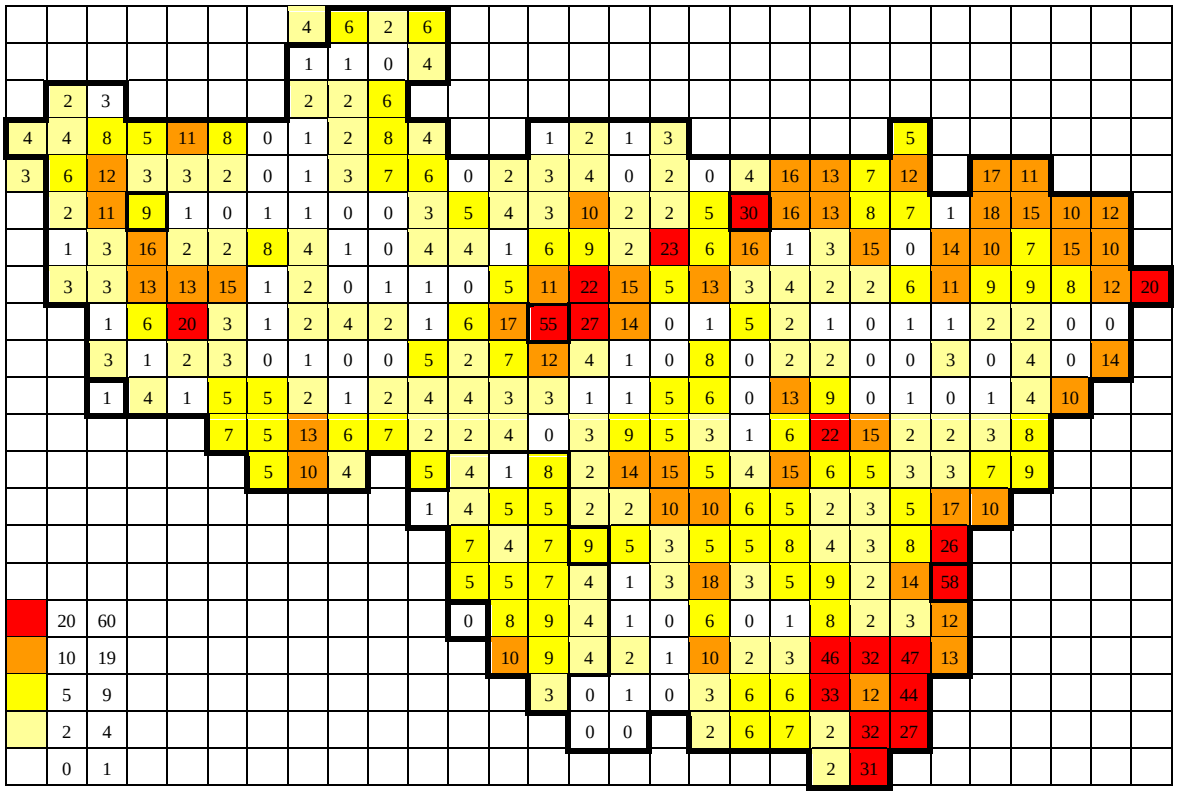


Fig. 2. Number of rare native species in each grid square as of end of 2014.

Decline in the number of rare species (Fig. 4) is resulted from accumulation of additional data—some species were treated as rare ones in 2014, but lost this status when they were discovered in 21+ grid squares by the end of 2015.

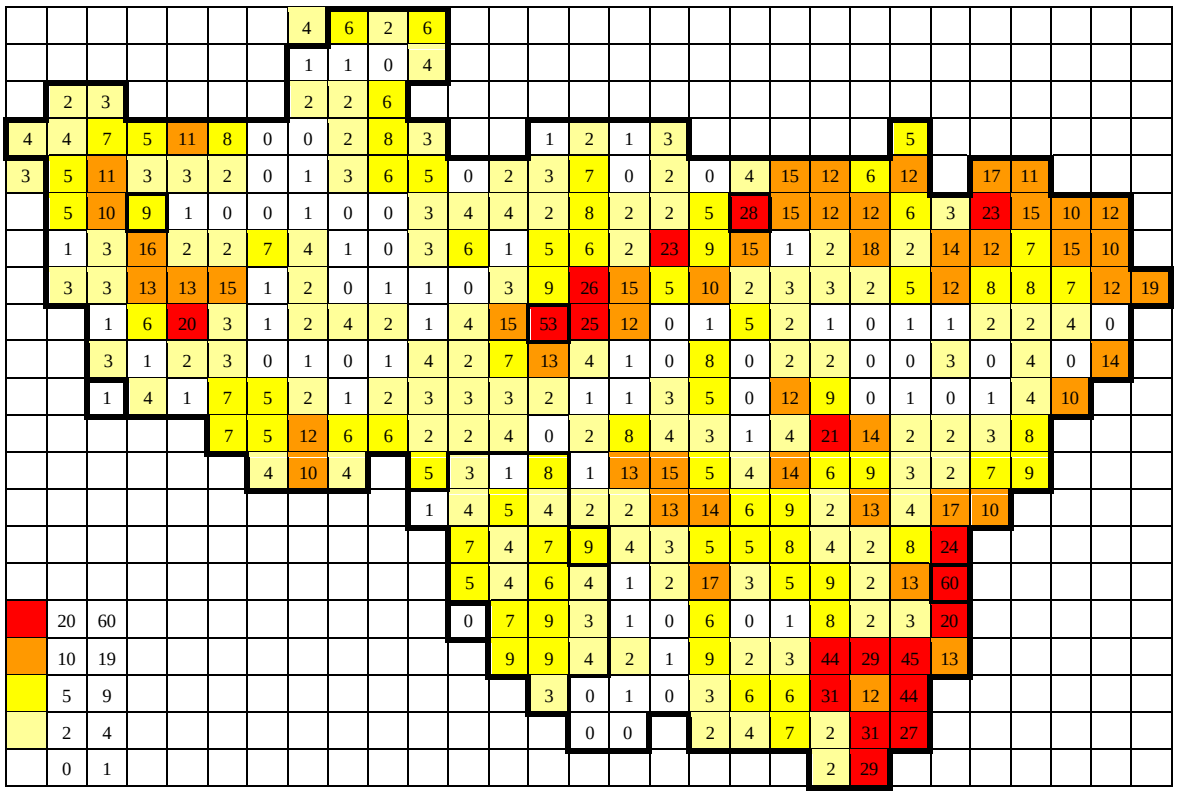


Fig. 3. Number of rare native species in each grid square as of end of 2015.

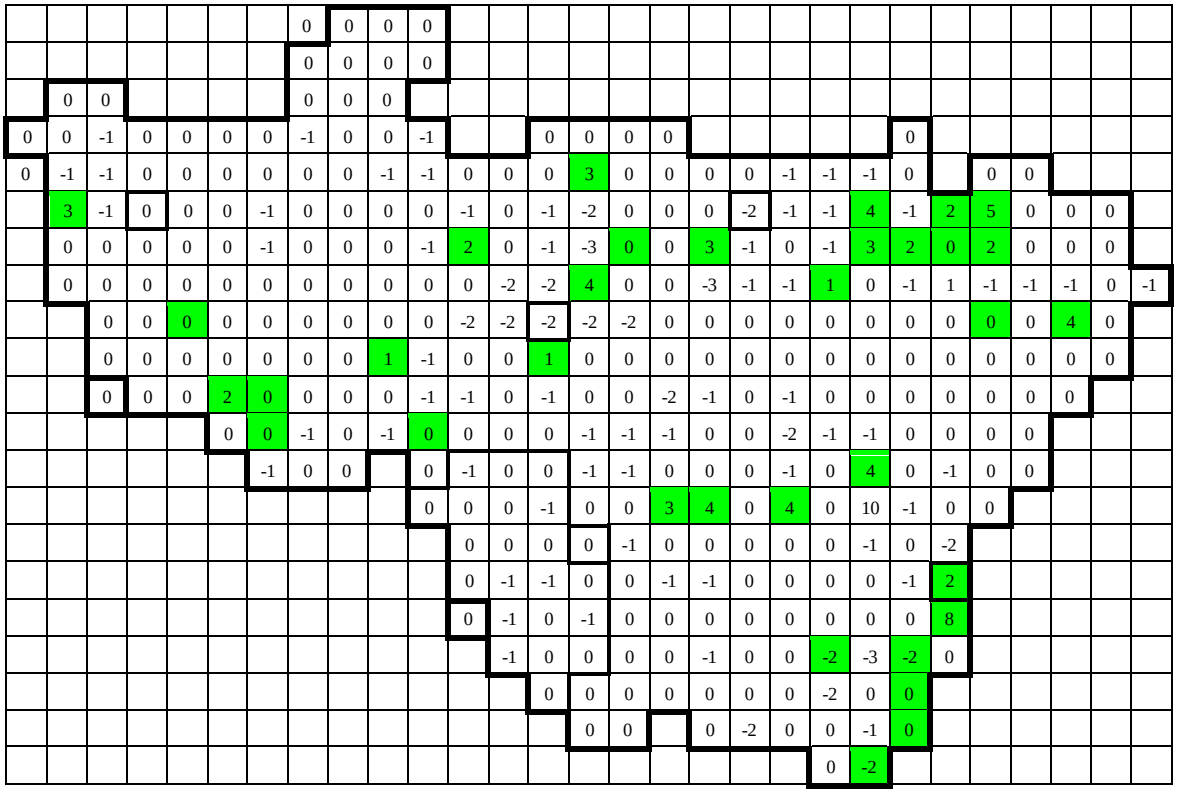


Fig. 4. Difference in grid numbers of rare native species as of end of 2014 and end of 2015. Grid squares studied in 2015 are highlighted with green.

A list of rare plant species recorded in each grid square is given in table 2.

Table 2. An outline of the field records of rare species in 2015.

Date	Grid	Basic locations	Rare species recorded
1.5.2015	Х2	Okshovo, Muratovo	Corydalis intermedia (L.) Merat (Papaveraceae) Filipendula vulgaris Moench (Rosaceae) Galium aparine L. (Rubiaceae)
1.5.2015	Ф8	Kaznevo	Cardamine quinquefolia (M. Bieb.) Schmalh. (Brassicaceae) Corydalis intermedia (L.) Merat (Papaveraceae) Filipendula vulgaris Moench (Rosaceae) Gagea erubescens (Besser) Schult. et Schult. f. (Liliaceae)
2.5.2015	У10	Voyutino	Gagea erubescens (Besser) Schult. et Schult. f. (Liliaceae) Lathraea squamaria L. (Orobanchaceae)
2.5.2015	Т11	Kaznevo	Gagea erubescens (Besser) Schult. et Schult. f. (Liliaceae)
3.5.2015	И3	Kirzhach	–
9.5.2015	Л4	Staroye Semenkovo	–
9.5.2015	М2	Novoye Perepechino	Jovibarba globifera (L.) J. Parn. (Crassulaceae)
10.5.2015	Ж23	Kourkovo – Stanki	Cornus alba L. (Cornaceae) Lathraea squamaria L. (Orobanchaceae)
10.5.2015	Ж22	Naleskino	Corydalis intermedia (L.) Merat (Papaveraceae) Gagea erubescens (Besser) Schult. et Schult. f. (Liliaceae)
11.5.2015	Л3	Pokrov, Maslyanye Gorochki	Erophila verna (L.) Besser (Brassicaceae)
23.5.2015	К8	Nergel River	Stellaria hebecalyx Fenzl (Caryophyllaceae)
24.5.2015	М6	Zhokhovo, Pogost	Carex caryophyllea Latourr. (Cyperaceae)
31.5.2015	Е1	Arsaki Station	Sanicula europaea L. (Apiaceae)
12.6.2015	Ж11	Bukholovo	Crepis sibirica L. (Asteraceae) Geum x intermedium Ehrh. (Rosaceae)
13.6.2015	З20	Novoye	–
14.6.2015	Д14	Kideksha	Carex caryophyllea Latourr. (Cyperaceae) Euphorbia semivillosa Prokh. (Euphorbiaceae) Tragopogon orientalis L. (Asteraceae)
21.6.2015	И25	Suvoroshch River	Galium aparine L. (Rubiaceae) Myriophyllum verticillatum L. (Haloragaceae) Sanicula europaea L. (Apiaceae) Scolochloa festucacea (Willd.) Link (Poaceae)
22.6.2015	Ж17	Gorki	Eleocharis uniglumis (Link) Schult. (Cyperaceae) Festuca valesiaca Schleich. ex Gaudin (Poaceae) Scutellaria hastifolia L. (Lamiaceae) Stellaria hebecalyx Fenzl (Caryophyllaceae)
5.7.2015	С12	Panfilovo	Adenophora liliifolia (L.) A. DC. (Campanulaceae) Chaiturus marrubiastrum (L.) Rchb. (Lamiaceae) Chenopodium acerifolium Andrz. (Amaranthaceae) Crypsis alopecuroides (Piller et Mitterp.) Schrad. (Poaceae) Eleocharis uniglumis (Link) Schult. (Cyperaceae) Euphorbia palustris L. (Euphorbiaceae) Festuca pseudovina Hack. ex Wiesb. (Poaceae) Festuca valesiaca Schleich. ex Gaudin (Poaceae) Lycopus exaltatus Ehrh. ex L. f. (Lamiaceae) Nonea pulla (L.) DC. (Boraginaceae) Ononis arvensis L. (Fabaceae) Rorippa austriaca (Crantz) Besser (Brassicaceae) Tragopogon orientalis L. (Asteraceae)
6.7.2015	О10	Novoye Bibeyevo	Eleocharis uniglumis (Link) Schult. (Cyperaceae) Epilobium parviflorum Schreb. (Onagraceae) Geranium sanguineum L. (Geraniaceae)
12.7.2015	Е21	Shustovo	Ajuga genevensis L. (Lamiaceae) Arabis sagittata (Bertol.) DC. (Brassicaceae) Carex caryophyllea Latourr. (Cyperaceae) Carex muricata L. (Cyperaceae) Conioselinum tataricum Hoffm. (Apiaceae) Lathyrus pisiformis L. (Fabaceae)

			Oxytropis pilosa (L.) DC. (Fabaceae) Pyrola media Sw. (Pyrolaceae)
13.7.2015	O7	Staroopokino	Carex atherodes Spreng. (Cyperaceae) Epilobium parviflorum Schreb. (Onagraceae) Poa remota Forselles (Poaceae) Scrophularia umbrosa Dumort. (Scrophulariaceae)
19.7.2015	H15	Novlyanka	Arabis pendula L. (Brassicaceae) Conioselinum tataricum Hoffm. (Apiaceae) Eleocharis uniglumis (Link) Schult. (Cyperaceae) Myriophyllum verticillatum L. (Haloragaceae) Scleranthus perennis L. (Caryophyllaceae) Scrophularia umbrosa Dumort. (Scrophulariaceae)
20.7.2015	Ж15	Nerl River	–
26.7.2015	E23	Lake Kanstra	Jacobaea tatarica (Less.) E. Wiebe (Asteraceae) Rumex x heterophyllus C.F. Schultz (R. x maximus Schreb.; R. aquaticus L. x R. hydrolapathum Huds.) (Polygonaceae)
27.7.2015	E24	Lake Skipskoye	Arenaria saxatilis L. (Caryophyllaceae) Carex disperma Dew. (Cyperaceae) Carex juncella (Fr.) Th. Fr. (Cyperaceae) Carex loliacea L. (Cyperaceae) Carex paupercula Michx. (Cyperaceae) Cytisus nigricans L. (Fabaceae) Diphasiastrum x zeilleri (Rouy) Holub (Lycopodiaceae) Festuca polesica Zapal. (Poaceae) Poa turfosa Litv. (Poaceae) Schoenoplectus tabernaemontani (C.C. Gmel.) Palla (Cyperaceae) Scolochloa festucacea (Willd.) Link (Poaceae) Stellaria crassifolia Ehrh. (Caryophyllaceae)
2.8.2015	Ж24	Novo	Carex juncella (Fr.) Th. Fr. (Cyperaceae) Jurinea cyanoides (L.) Rchb. (Asteraceae) Poa turfosa Litv. (Poaceae) Schoenoplectus tabernaemontani (C.C. Gmel.) Palla (Cyperaceae) Silene borysthenica (Gruner) Walters (Caryophyllaceae)
3.8.2015	И23	Uspensky Pogost	–
9.8.2015	Ж21	Yuryshki	Arabis sagittata (Bertol.) DC. (Brassicaceae) Blysmus compressus (L.) Panz. ex Link (Cyperaceae) Carex muricata L. (Cyperaceae) Cirsium x hybridum W.D.J. Koch ex DC. (C. oleraceum (L.) Scop. x C. palustre (L.) Scop.) (Asteraceae) Galium triflorum Michx. (Rubiaceae)
10.8.2015	K12	Mostostroy	Eleocharis mamillata (H. Lindb.) H. Lindb. (Cyperaceae) Galatella rossica Novopokr. (Asteraceae) Laserpitium prutenicum L. (Apiaceae) Salvinia natans (L.) All. (Salviniaceae)
16.8.2015	O8	Gubtsevo	Cardamine parviflora L. (Brassicaceae) Carex atherodes Spreng. (Cyperaceae) Carex juncella (Fr.) Th. Fr. (Cyperaceae) Circaea lutetiana L. (Onagraceae) Malaxis monophyllos (L.) Sw. (Orchidaceae) Poa remota Forselles (Poaceae) Poa turfosa Litv. (Poaceae) Stellaria crassifolia Ehrh. (Caryophyllaceae) Trisetum sibiricum Rupr. (Poaceae)
17.8.2015	314	Lunevo	Chenopodium acerifolium Andrz. (Amaranthaceae) Circaea lutetiana L. (Onagraceae) Galatella rossica Novopokr. (Asteraceae) Rumex x heterophyllus C.F. Schultz (R. x maximus Schreb.; R. aquaticus L. x R. hydrolapathum Huds.) (Polygonaceae) Symphytum officinale L. (Boraginaceae)
23.8.2015	T9	Ivatino, Melenki	Epilobium parviflorum Schreb. (Onagraceae)

			Juncus (Juncaceae) Poa turfosa Litv. (Poaceae) Symphytum officinale L. (Boraginaceae)
24.8.2015	P13	Karacharovo	Chenopodium acerifolium Andrz. (Amaranthaceae) Corispermum marschallii Steven (Amaranthaceae) Crypsis alopecuroides (Piller et Mitterp.) Schrad. (Poaceae) Eleocharis uniglumis (Link) Schult. (Cyperaceae) Festuca valesiaca Schleich. ex Gaudin (Poaceae) Juncus (Juncaceae) Lycopus exaltatus Ehrh. ex L. f. (Lamiaceae) Najas major L. (Hydrocharitaceae) Symphytum officinale L. (Boraginaceae)

Species by species: records of rare plants in 2015

Species: ***Corydalis intermedia*** (L.) Mérat
Family: Papaveraceae
Red lists: Red Data Book of Vladimir Oblast (status: 3).

Number of grid records (pre-2015):	8
Number of grid records in 2015:	3
New records:	1
Confirmations of historical records:	2
Confirmations of recent records:	-
Current number of grid records:	9 **(+13%)**

Grids with records of 2015:
Х2
Ф8
Ж22


1 May 2015, Melenki District, Okshovo


1 May 2015, Melenki District, Voyutino

10 May 2015, Vyazniki District, Stanki

Species: ***Galium aparine*** L.
Family: Rubiaceae
Red lists: no

Number of grid records (pre-2015):	5
Number of grid records in 2015:	2
New records:	1
Confirmations of historical records:	-
Confirmations of recent records:	1
Current number of grid records:	6 **(+20%)**

Grids with records of 2015:
X2
И25


1 May 2015, Melenki District, Okshovo


21 June 2015, Gorokhovets District, the Suvoroshch River

Species: ***Filipendula vulgaris*** Moench
Family: Rosaceae
Red lists: no

Number of grid records (pre-2015):	20
Number of grid records in 2015:	3
New records:	-
Confirmations of historical records:	-
Confirmations of recent records:	3
Current number of grid records:	20

Grids with records of 2015:
X2
Ф8
C12


1 May 2015, Melenki District, Okshovo

Species: ***Gagea erubescens*** (Besser) Schult. et Schult. f.
Family: Liliaceae
Red lists: no

Number of grid records (pre-2015):	15
Number of grid records in 2015:	4
New records:	3
Confirmations of historical records:	1
Confirmations of recent records:	-
Current number of grid records:	18 **(+20%)**

Grids with records of 2015:
Ф8
У10
Т11
Ж22


1 May 2015, Melenki District, Voyutino


10 May 2015, Vyazniki District, Stanki

Species: ***Lathraea squamaria*** L.
Family: Orobanchaceae
Red lists: no

Number of grid records (pre-2015):	19
Number of grid records in 2015:	2
New records:	1
Confirmations of historical records:	-
Confirmations of recent records:	1
Current number of grid records:	20 **(+5%)**

Grids with records of 2015:
У10
Ж23


2 May 2015, Melenki District, Kaznevo


10 May 2015, Vyazniki District, Kourkovo – Borzyn area

Species: ***Cardamine quinquefolia*** (M. Bieb.) Schmalh.
Family: Brassicaceae
Red lists: Red Data Book of Vladimir Oblast (status: 3).

Number of grid records (pre-2015):	3
Number of grid records in 2015:	1
New records:	-
Confirmations of historical records:	1
Confirmations of recent records:	-
Current number of grid records:	3

Grids with records of 2015:
Ф8


2 May 2015, Melenki District, Kaznevo


2 May 2015, Melenki District, Kaznevo

Species: ***Jovibarba globifera*** (L.) J. Parn.
Family: Crassulaceae
Red lists: Red Data Book of Vladimir Oblast (status: 2).

Number of grid records (pre-2015):	6 (native occurrences)
Number of grid records in 2015:	1
New records:	-
Confirmations of historical records:	-
Confirmations of recent records:	1
Current number of grid records:	6

Grids with records of 2015:
M2


9 May 2015, Petushki District, Novoye Perepechino


9 May 2015, Petushki District, Novoye Perepechino

Species: ***Cornus alba*** L.
Family: Cornaceae
Red lists: Red Data Book of Vladimir Oblast (status: 3).

Number of grid records (pre-2015):	15
Number of grid records in 2015:	2
New records:	1
Confirmations of historical records:	-
Confirmations of recent records:	1
Current number of grid records:	16 **(+6%)**

Grids with records of 2015:
323
Ж23

10 May 2015, Vyazniki District, Kourkovo – Borzyn area

Species: ***Erophila verna*** (L.) Besser
Family: Brassicaceae
Red lists: no

Number of grid records (pre-2015):	17
Number of grid records in 2015:	1
New records:	1
Confirmations of historical records:	-
Confirmations of recent records:	-
Current number of grid records:	18 **(+6%)**

Grids with records of 2015:
ЛІ3

11 May 2015, Petushki District, Zadneye Pole

Species: ***Stellaria hebecalyx*** Fenzl
Family: Caryophyllaceae
Red lists: Red Data Book of Vladimir Oblast (appendix).

Number of grid records (pre-2015):	12
Number of grid records in 2015:	2
New records:	2
Confirmations of historical records:	-
Confirmations of recent records:	-
Current number of grid records:	14 **(+17%)**

Grids with records of 2015:
К8
Ж17


23 May 2015, Petushki District, the Nergel River


23 May 2015, Petushki District, the Nergel River

Species: ***Carex caryophyllea*** Latourr.
Family: Cyperaceae
Red lists: Red Data Book of Vladimir Oblast (status: 3).

Number of grid records (pre-2015):	18
Number of grid records in 2015:	3
New records:	3
Confirmations of historical records:	-
Confirmations of recent records:	-
Current number of grid records:	**21 (+17%)**

Grids with records of 2015:
M6
Д14
E21

14 May 2015, Suzdal District, Kideksha

Species: ***Sanicula europaea*** L.
Family: Apiaceae
Red lists: Red Data Book of Vladimir Oblast (status: 3).

Number of grid records (pre-2015):	13
Number of grid records in 2015:	2
New records:	2
Confirmations of historical records:	-
Confirmations of recent records:	-
Current number of grid records:	15 **(+15%)**

Grids with records of 2015:
E1
И25


31 May 2015, Aleksandrov District, Arsaki station


21 June 2015, Gorokhovets District, Kuplya

Species: ***Crepis sibirica*** L.
Family: Asteraceae
Red lists: Red Data Book of Vladimir Oblast (status: 3).

Number of grid records (pre-2015):	15
Number of grid records in 2015:	1
New records:	1
Confirmations of historical records:	-
Confirmations of recent records:	-
Current number of grid records:	16 **(+7%)**

Grids with records of 2015:
Ж11


12 June 2015, Sobinki District, Bukholovo

Species: ***Euphorbia semivillosa*** Prokh.
Family: Euphorbiaceae
Red lists: Red Data Book of Vladimir Oblast (appendix, sub nom. *E. villosa* auct.).

Number of grid records (pre-2015):	-
Number of grid records in 2015:	1
New records:	1
Confirmations of historical records:	-
Confirmations of recent records:	-
Current number of grid records:	1 **(new species)**

Grids with records of 2015:
Д14


14 May 2015, Suzdal District, Kideksha


14 May 2015, Suzdal District, Kideksha

Species: ***Scolochloa festucacea*** (Willd.) Link
Family: Poaceae
Red lists: Red Data Book of Vladimir Oblast (status: 3).

Number of grid records (pre-2015):	11
Number of grid records in 2015:	2
New records:	1
Confirmations of historical records:	1
Confirmations of recent records:	-
Current number of grid records:	12 **(+9%)**

Grids with records of 2015:
И25
Е24

21 June 2015, Gorokhovets District, the Suvoroshch River

Species: ***Eleocharis uniglumis*** (Link) Schult.
Family: Cyperaceae
Red lists: no

Number of grid records (pre-2015):	10
Number of grid records in 2015:	5
New records:	5
Confirmations of historical records:	-
Confirmations of recent records:	-
Current number of grid records:	15 **(+50%)**

Grids with records of 2015:
Ж17
C12
O10
H15
P13


22 June 2015, Kameshkovsky District, Gorki


5 July 2015, Muromsky District, Panfilovo

Species: ***Festuca valesiaca*** Schleich. ex Gaudin
Family: Poaceae
Red lists: no

Number of grid records (pre-2015):	14
Number of grid records in 2015:	3
New records:	3
Confirmations of historical records:	-
Confirmations of recent records:	-
Current number of grid records:	17 **(+21%)**

Grids with records of 2015:
Ж17
С12
Р13


22 June 2015, Kameshkovsky District, Gorki

Species: ***Scutellaria hastifolia*** L.
Family: Lamiaceae
Red lists: Red Data Book of Vladimir Oblast (status: 3).

Number of grid records (pre-2015):	18
Number of grid records in 2015:	1
New records:	-
Confirmations of historical records:	1
Confirmations of recent records:	-
Current number of grid records:	18

Grids with records of 2015:
Ж17


22 June 2015, Kameshkovsky District, Gorki

Species: ***Nonea pulla*** (L.) DC.
Family: Boraginaceae
Red lists: no

Number of grid records (pre-2015):	20
Number of grid records in 2015:	1
New records:	-
Confirmations of historical records:	-
Confirmations of recent records:	1
Current number of grid records:	20

Grids with records of 2015:
C12

5 July 2015, Muromsky District, Panfilovo

Species: ***Lycopus exaltatus*** Ehrh. ex L. f.
Family: Lamiaceae
Red lists: Red Data Book of Vladimir Oblast (status: 3).

Number of grid records (pre-2015):	13
Number of grid records in 2015:	2
New records:	-
Confirmations of historical records:	-
Confirmations of recent records:	2
Current number of grid records:	13

Grids with records of 2015:
C12
P13


24 August 2015, Murom, Karacharovo


24 August 2015, Murom, Karacharovo

Species: ***Ononis arvensis*** L.
Family: Fabaceae
Red lists: no

Number of grid records (pre-2015):	11
Number of grid records in 2015:	1
New records:	1
Confirmations of historical records:	-
Confirmations of recent records:	-
Current number of grid records:	12 **(+9%)**

Grids with records of 2015:
C12

5 July 2015, Muromsky District, Panfilovo

Species: ***Conioselinum tataricum*** Hoffm.
Family: Apiaceae
Red lists: Red Data Book of Vladimir Oblast (status: 3).

Number of grid records (pre-2015):	17
Number of grid records in 2015:	2
New records:	1
Confirmations of historical records:	-
Confirmations of recent records:	1
Current number of grid records:	18 **(+6%)**

Grids with records of 2015:
E21
H15

19 July 2015, Selivanovsky District, above Novlyanka

Species: ***Chaiturus marrubiastrum*** (L.) Rchb.
Family: Lamiaceae
Red lists: no

Number of grid records (pre-2015):	9
Number of grid records in 2015:	1
New records:	-
Confirmations of historical records:	-
Confirmations of recent records:	1
Current number of grid records:	9

Grids with records of 2015:
C12

5 July 2015, Muromsky District, Panfilovo

Species: ***Adenophora liliifolia*** (L.) A. DC.
Family: Campanulaceae
Red lists: Red Data Book of Vladimir Oblast (status: 3).

Number of grid records (pre-2015):	16
Number of grid records in 2015:	1
New records:	1
Confirmations of historical records:	-
Confirmations of recent records:	-
Current number of grid records:	17 **(+6%)**

Grids with records of 2015:
C12


5 July 2015, Muromsky District, Panfilovo

Species: ***Euphorbia palustris*** L.
Family: Euphorbiaceae
Red lists: Red Data Book of Vladimir Oblast (appendix).

Number of grid records (pre-2015):	8
Number of grid records in 2015:	1
New records:	1
Confirmations of historical records:	-
Confirmations of recent records:	-
Current number of grid records:	9 **(+13%)**

Grids with records of 2015:
C12

5 July 2015, Muromsky District, Panfilovo

Species: ***Festuca pseudovina*** Hack. ex Wiesb.
Family: Poaceae
Red lists: no

Number of grid records (pre-2015):	2
Number of grid records in 2015:	1
New records:	-
Confirmations of historical records:	-
Confirmations of recent records:	1
Current number of grid records:	2

Grids with records of 2015:
C12

5 July 2015, Muromsky District, Panfilovo

Species: ***Crypsis alopecuroides*** (Piller et Mitterp.) Schrad.
Family: Poaceae
Red lists: no

Number of grid records (pre-2015):	5
Number of grid records in 2015:	2
New records:	1
Confirmations of historical records:	-
Confirmations of recent records:	1
Current number of grid records:	6 **(+20%)**

Grids with records of 2015:
C12
P13


24 August 2015, Murom, Karacharovo


24 August 2015, Murom, Karacharovo

Species: ***Arabis pendula*** L.
Family: Brassicaceae
Red lists: Red Data Book of Vladimir Oblast (status: 3).

Number of grid records (pre-2015):	17
Number of grid records in 2015:	2
New records:	1
Confirmations of historical records:	1
Confirmations of recent records:	-
Current number of grid records:	18 **(+6%)**

Grids with records of 2015:
O10
H15


6 July 2015, Selivanovsky District, Novoye Bibeyevo


19 July 2015, Selivanovsky District, above Novlyanka

Species: ***Geranium sanguineum*** L.
Family: Geraniaceae
Red lists: Red Data Book of Vladimir Oblast (status: 3).

Number of grid records (pre-2015):	8
Number of grid records in 2015:	1
New records:	1
Confirmations of historical records:	-
Confirmations of recent records:	-
Current number of grid records:	9 **(+13%)**

Grids with records of 2015:
O10


6 July 2015, Selivanovsky District, Novoye Bibeyevo

Species: ***Epilobium parviflorum*** Schreb.
Family: Onagraceae
Red lists: no

Number of grid records (pre-2015):	13
Number of grid records in 2015:	3
New records:	2
Confirmations of historical records:	-
Confirmations of recent records:	1
Current number of grid records:	15 **(+15%)**

Grids with records of 2015:
O10
O7
T9


6 July 2015, Selivanovsky District, Novoye Bibeyevo

Species: ***Thymus pulegioides*** auct.
Family: Lamiaceae
Red lists: Red Data Book of Vladimir Oblast (status: 4).

Number of grid records (pre-2015):	ca. 10
Number of grid records in 2015:	1
New records:	-
Confirmations of historical records:	1
Confirmations of recent records:	-
Current number of grid records:	ca. 11

Grids with records of 2015:
O10

6 July 2015, Selivanovsky District, Novoye Bibeyevo

Species: ***Carex muricata*** L.
Family: Cyperaceae
Red lists: no

Number of grid records (pre-2015):	18
Number of grid records in 2015:	2
New records:	1
Confirmations of historical records:	1
Confirmations of recent records:	-
Current number of grid records:	19 **(+6%)**

Grids with records of 2015:
E21
Ж21


9 August 2015, Vyaznikovsky District, Yuryshki


9 August 2015, Vyaznikovsky District, Yuryshki

Species: ***Arabis sagittata*** (Bertol.) DC.
Family: Brassicaceae
Red lists: Red Data Book of Vladimir Oblast (status: 3).

Number of grid records (pre-2015):	5
Number of grid records in 2015:	2
New records:	-
Confirmations of historical records:	2
Confirmations of recent records:	-
Current number of grid records:	5

Grids with records of 2015:
E21
Ж21


12 July 2015, Vyaznikovsky District, Shustovo

Species: ***Oxytropis pilosa*** (L.) DC.
Family: Fabaceae
Red lists: no

Number of grid records (pre-2015):	2
Number of grid records in 2015:	1
New records:	1
Confirmations of historical records:	-
Confirmations of recent records:	-
Current number of grid records:	3 **(+50%)**

Grids with records of 2015:
E21


12 July 2015, Vyaznikovsky District, Shustovo


12 July 2015, Vyaznikovsky District, Shustovo

Species: ***Poa remota*** Forselles
Family: Poaceae
Red lists: Red Data Book of Vladimir Oblast (status: 3).

Number of grid records (pre-2015):	19
Number of grid records in 2015:	2
New records:	1
Confirmations of historical records:	1
Confirmations of recent records:	-
Current number of grid records:	20 **(+5%)**

Grids with records of 2015:
O7
O8


13 July 2015, Gus-Khrustalny District, Staroopokino


13 July 2015, Gus-Khrustalny District, Staroopokino

Species: ***Scrophularia umbrosa*** Dumort.
Family: Scrophulariaceae
Red lists: Red Data Book of Vladimir Oblast (status: 3).

Number of grid records (pre-2015):	11
Number of grid records in 2015:	2
New records:	1
Confirmations of historical records:	-
Confirmations of recent records:	1
Current number of grid records:	12 **(+9%)**

Grids with records of 2015:
O7
H15


13 July 2015, Gus-Khrustalny District, Staroopokino


13 July 2015, Gus-Khrustalny District, Staroopokino

Species: ***Carex atherodes*** Spreng.
Family: Cyperaceae
Red lists: Red Data Book of Vladimir Oblast (status: 3).

Number of grid records (pre-2015):	15
Number of grid records in 2015:	2
New records:	2
Confirmations of historical records:	-
Confirmations of recent records:	-
Current number of grid records:	17 **(+13%)**

Grids with records of 2015:
O7
O8


13 July 2015, Gus-Khrustalny District, Staroopokino

Species: ***Cirsium*** ×***hybridum*** W.D.J. Koch ex DC. (*C. oleraceum* (L.) Scop. × *C. palustre* (L.) Scop.)
Family: Asteraceae
Red lists: no

Number of grid records (pre-2015):	1
Number of grid records in 2015:	2
New records:	2
Confirmations of historical records:	-
Confirmations of recent records:	-
Current number of grid records:	3 **(+200%)**

Grids with records of 2015:
O7
Ж21


13 July 2015, Gus-Khrustalny District, Staroopokino


9 August 2015, Vyaznikovsky District, Yuryshki


13 July 2015, Gus-Khrustalny District, Staroopokino

Species: ***Scleranthus perennis*** L.
Family: Caryophyllaceae
Red lists: no

Number of grid records (pre-2015):	20
Number of grid records in 2015:	1
New records:	-
Confirmations of historical records:	-
Confirmations of recent records:	1
Current number of grid records:	20

Grids with records of 2015:
H15


19 July 2015, Selivanovsky District, above Novlyanka

Species: ***Jacobaea tatarica*** (Less.) E. Wiebe
Family: Asteraceae
Red lists: Red Data Book of Vladimir Oblast (status: 3).

Number of grid records (pre-2015):	11
Number of grid records in 2015:	1
New records:	1
Confirmations of historical records:	-
Confirmations of recent records:	-
Current number of grid records:	12 **(+9%)**

Grids with records of 2015:
E23


26 July 2015, Vyaznikovsky District, Lake Kanstra


26 July 2015, Vyaznikovsky District, Lake Kanstra

Species: ***Carex paupercula*** Michx.
Family: Cyperaceae
Red lists: Red Data Book of Vladimir Oblast (status: 3).

Number of grid records (pre-2015):	4
Number of grid records in 2015:	1
New records:	1
Confirmations of historical records:	-
Confirmations of recent records:	-
Current number of grid records:	5 **(+25%)**

Grids with records of 2015:
E24


27 July 2015, Vyaznikovsky District, Lake Skipskoye (Verkneye)


27 July 2015, Vyaznikovsky District, Lake Skipskoye (Verkneye)

Species: ***Stellaria crassifolia*** Ehrh.
Family: Caryophyllaceae
Red lists: Red Data Book of Vladimir Oblast (status: 3).

Number of grid records (pre-2015):	12
Number of grid records in 2015:	2
New records:	1
Confirmations of historical records:	-
Confirmations of recent records:	1
Current number of grid records:	13 **(+8%)**

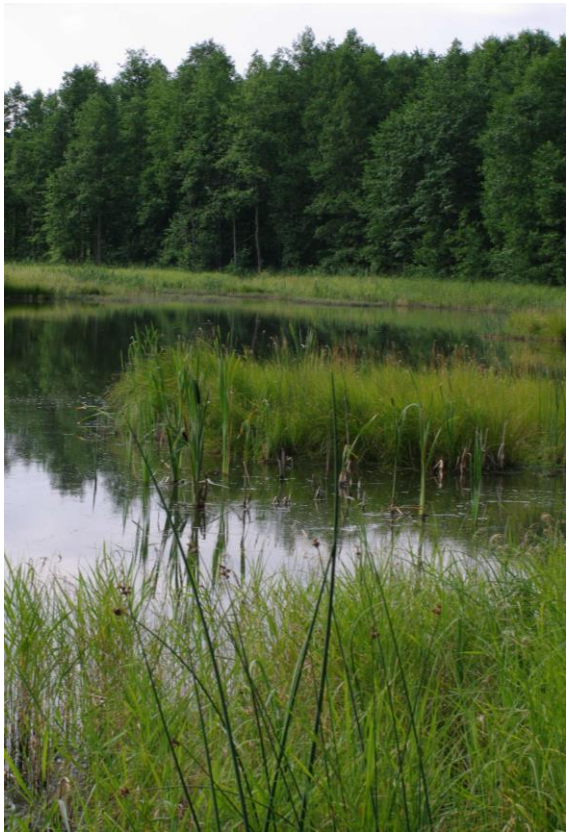
Grids with records of 2015:
E24
O8


27 July 2015, Vyaznikovsky District, Lake Skipskoye (Verkneye)

Species: ***Schoenoplectus tabernaemontani*** (C.C. Gmel.) Palla
Family: Cyperaceae
Red lists: Red Data Book of Vladimir Oblast (status: 3).

Number of grid records (pre-2015):	3
Number of grid records in 2015:	2
New records:	1
Confirmations of historical records:	-
Confirmations of recent records:	1
Current number of grid records:	4 **(+33%)**

Grids with records of 2015:
E24
Ж24



27 July 2015, Vyaznikovsky District, Lake Skipskoye (Verkneye) [*photo by Sergey Dudov*]

2 August 2015, Vyaznikovsky District, Novo

2 August 2015, Vyaznikovsky District, Novo

Species: ***Diphasiastrum* ×*zeilleri*** (Rouy) Holub
Family: Lycopodiaceae
Red lists: Red Data Book of Vladimir Oblast (status: 4), sub nom. *Lycopodium tristachyum* auct.

Number of grid records (pre-2015):	13
Number of grid records in 2015:	1
New records:	-
Confirmations of historical records:	-
Confirmations of recent records:	1
Current number of grid records:	13

Grids with records of 2015:
E24


27 July 2015, Vyaznikovsky District, Lake Skipskoye (Verkneye)


27 July 2015, Vyaznikovsky District, Lake Skipskoye (Verkneye)

Species: ***Jurinea cyanoides*** (L.) Rchb.
Family: Asteraceae
Red lists: no

Number of grid records (pre-2015):	13
Number of grid records in 2015:	1
New records:	-
Confirmations of historical records:	1
Confirmations of recent records:	-
Current number of grid records:	13

Grids with records of 2015:
Ж24


2 August 2015, Vyaznikovsky District, Novo


2 August 2015, Vyaznikovsky District, Novo

Species: ***Blysmus compressus*** (L.) Panz. ex Link
Family: Cyperaceae
Red lists: no

Number of grid records (pre-2015):	9
Number of grid records in 2015:	1
New records:	-
Confirmations of historical records:	1
Confirmations of recent records:	-
Current number of grid records:	9

Grids with records of 2015:
Ж21

9 August 2015, Vyaznikovsky District, Yuryshki

Species: ***Galium triflorum*** Michx.
Family: Rubiaceae
Red lists: Red Data Book of Vladimir Oblast (status: 3).

Number of grid records (pre-2015):	16
Number of grid records in 2015:	1
New records:	1
Confirmations of historical records:	-
Confirmations of recent records:	-
Current number of grid records:	17 **(+6%)**

Grids with records of 2015:
Ж21


9 August 2015, Vyaznikovsky District, Yuryshki

Species: ***Salvinia natans*** (L.) All.
Family: Salviniaceae
Red lists: Red Data Book of Vladimir Oblast (status: 3).

Number of grid records (pre-2015):	14
Number of grid records in 2015:	1
New records:	-
Confirmations of historical records:	-
Confirmations of recent records:	1
Current number of grid records:	14

Grids with records of 2015:
K12

10 August 2015, Vladimir, Mostostroy Station

Species: ***Galatella rossica*** Novopokr.
Family: Asteraceae
Red lists: no

Number of grid records (pre-2015):	19
Number of grid records in 2015:	2
New records:	-
Confirmations of historical records:	1
Confirmations of recent records:	1
Current number of grid records:	19

Grids with records of 2015:
K12
314


17 August 2015, Vladimir, Lunevo


17 August 2015, Vladimir, Lunevo

Species: ***Cardamine parviflora*** L.
Family: Brassicaceae
Red lists: Red Data Book of Vladimir Oblast (status: 3).

Number of grid records (pre-2015):	19
Number of grid records in 2015:	1
New records:	1
Confirmations of historical records:	-
Confirmations of recent records:	-
Current number of grid records:	20 **(+5%)**

Grids with records of 2015:
O8


16 August 2015, Gus-Khrustalny District, Gubtsevo

Species: ***Circaea lutetiana*** L.
Family: Onagraceae
Red lists: Red Data Book of Vladimir Oblast (status: 3).

Number of grid records (pre-2015):	16
Number of grid records in 2015:	2
New records:	2
Confirmations of historical records:	-
Confirmations of recent records:	-
Current number of grid records:	18 **(+13%)**

Grids with records of 2015:
O8
314


16 August 2015, Gus-Khrustalny District, Gubtsevo


17 August 2015, Vladimir, Lunevo

Species: ***Malaxis monophyllos*** (L.) Sw.
Family: Orchidaceae
Red lists: Red Data Book of Vladimir Oblast (status: 2).

Number of grid records (pre-2015):	11
Number of grid records in 2015:	1
New records:	1
Confirmations of historical records:	-
Confirmations of recent records:	-
Current number of grid records:	12 **(+9%)**

Grids with records of 2015:
O8


16 August 2015, Gus-Khrustalny District, Gubtsevo


16 August 2015, Gus-Khrustalny District, Gubtsevo

Species: ***Trisetum sibiricum*** Rupr.
Family: Poaceae
Red lists: Red Data Book of Vladimir Oblast (status: 3).

Number of grid records (pre-2015):	9
Number of grid records in 2015:	1
New records:	-
Confirmations of historical records:	1
Confirmations of recent records:	-
Current number of grid records:	9

Grids with records of 2015:
O8


16 August 2015, Gus-Khrustalny District, Gubtsevo

Species: ***Symphytum officinale*** L.
Family: Boraginaceae
Red lists: no

Number of grid records (pre-2015):	15
Number of grid records in 2015:	3
New records:	1
Confirmations of historical records:	1
Confirmations of recent records:	1
Current number of grid records:	16 **(+7%)**

Grids with records of 2015:
314
T9
P13

23 August 2015, Melenkovsky District, Ivatino

Species: ***Juncus***
Family: Juncaceae
Red lists:

Number of grid records (pre-2015):	
Number of grid records in 2015:	
New records:	
Confirmations of historical records:	
Confirmations of recent records:	
Current number of grid records:	

Grids with records of 2015:
T9
P13


24 August 2015, Murom, Karacharovo


24 August 2015, Murom, Karacharovo

Species: ***Najas major*** L.
Family: Hydrocharitaceae
Red lists: no

Number of grid records (pre-2015):	2
Number of grid records in 2015:	1
New records:	1
Confirmations of historical records:	-
Confirmations of recent records:	-
Current number of grid records:	3 **(+50%)**

Grids with records of 2015:
P13

24 August 2015, Murom, Karacharovo

Species: ***Corispermum marschallii*** Steven
Family: Amaranthaceae
Red lists: no

Number of grid records (pre-2015):	13
Number of grid records in 2015:	1
New records:	-
Confirmations of historical records:	1
Confirmations of recent records:	-
Current number of grid records:	13

Grids with records of 2015:
Р13

Species: ***Laserpitium prutenicum*** L.
Family: Apiaceae
Red lists: Red Data Book of Vladimir Oblast (status: 3).

Number of grid records (pre-2015):	6
Number of grid records in 2015:	1
New records:	-
Confirmations of historical records:	-
Confirmations of recent records:	1
Current number of grid records:	6

Grids with records of 2015:
К12

Species: ***Geum* ×*intermedium*** Ehrh.
Family: Rosaceae
Red lists: no

Number of grid records (pre-2015):	18
Number of grid records in 2015:	1
New records:	1
Confirmations of historical records:	-
Confirmations of recent records:	-
Current number of grid records:	19 **(+6%)**

Grids with records of 2015:
Ж11

Species: ***Tragopogon orientalis*** L.
Family: Asteraceae
Red lists: no

Number of grid records (pre-2015):	5*
Number of grid records in 2015:	2
New records:	2
Confirmations of historical records:	-
Confirmations of recent records:	-
Current number of grid records:	7 **(+40%)**

Grids with records of 2015:
Д14
С12

Species: ***Myriophyllum verticillatum*** L.
Family: Haloragaceae
Red lists: Red Data Book of Vladimir Oblast (status: 3).

Number of grid records (pre-2015):	12
Number of grid records in 2015:	2
New records:	2
Confirmations of historical records:	-
Confirmations of recent records:	-
Current number of grid records:	14 **(+17%)**

Grids with records of 2015:
И25
Н15

Species: ***Ajuga genevensis*** L.
Family: Lamiaceae
Red lists: no

Number of grid records (pre-2015):	13
Number of grid records in 2015:	1
New records:	1
Confirmations of historical records:	-
Confirmations of recent records:	-
Current number of grid records:	14 **(+8%)**

Grids with records of 2015:
Е21

Species: ***Pyrola media*** Sw.
Family: Pyrolaceae
Red lists: no

Number of grid records (pre-2015):	17
Number of grid records in 2015:	1
New records:	1
Confirmations of historical records:	-
Confirmations of recent records:	-
Current number of grid records:	18 **(+6%)**

Grids with records of 2015:
E21

Species: ***Cynosurus cristatus*** L.
Family: Poaceae
Red lists: no

Number of grid records (pre-2015):	18
Number of grid records in 2015:	1
New records:	-
Confirmations of historical records:	1
Confirmations of recent records:	-
Current number of grid records:	18

Grids with records of 2015:
323

Species: ***Chenopodium acerifolium*** Andrz.
Family: Amaranthaceae
Red lists: no

Number of grid records (pre-2015):	5
Number of grid records in 2015:	3
New records:	3
Confirmations of historical records:	-
Confirmations of recent records:	-
Current number of grid records:	8 **(+60%)**

Grids with records of 2015:
C12
314
P13

Species: ***Rorippa austriaca*** (Crantz) Besser
Family: Brassicaceae
Red lists: no

Number of grid records (pre-2015):	10
Number of grid records in 2015:	1
New records:	1
Confirmations of historical records:	-
Confirmations of recent records:	-
Current number of grid records:	11 **(+10%)**

Grids with records of 2015:
C12

Species: ***Lathyrus pisiformis*** L.
Family: Fabaceae
Red lists: no

Number of grid records (pre-2015):	2
Number of grid records in 2015:	1
New records:	1
Confirmations of historical records:	1
Confirmations of recent records:	-
Current number of grid records:	3 **(+50%)**

Grids with records of 2015:
E21

Species: ***Rumex ×heterophyllus*** C.F. Schultz (*R.* ×*maximus* Schreb.; *R. aquaticus* L. × *R. hydrolapathum* Huds.)
Family: Polygonaceae
Red lists: no

Number of grid records (pre-2015):	3
Number of grid records in 2015:	2
New records:	2
Confirmations of historical records:	-
Confirmations of recent records:	-
Current number of grid records:	5

Grids with records of 2015:
E23
314

Species: ***Cytisus nigricans*** L.
Family: Fabaceae
Red lists: no

Number of grid records (pre-2015):	15
Number of grid records in 2015:	1
New records:	-
Confirmations of historical records:	-
Confirmations of recent records:	1
Current number of grid records:	15

Grids with records of 2015:
E24

Species: ***Carex loliacea*** L.
Family: Cyperaceae
Red lists: Red Data Book of Vladimir Oblast (appendix).

Number of grid records (pre-2015):	16
Number of grid records in 2015:	1
New records:	1
Confirmations of historical records:	-
Confirmations of recent records:	-
Current number of grid records:	17 **(+6%)**

Grids with records of 2015:
E24

Species: ***Carex juncella*** (Fr.) Th. Fr.
Family: Cyperaceae
Red lists: no

Number of grid records (pre-2015):	20
Number of grid records in 2015:	3
New records:	2
Confirmations of historical records:	1
Confirmations of recent records:	-
Current number of grid records:	**22 (+10%)**

Grids with records of 2015:
E24
Ж24
O8

Species: ***Carex disperma*** Dew.
Family: Cyperaceae
Red lists: no

Number of grid records (pre-2015):	11
Number of grid records in 2015:	1
New records:	1
Confirmations of historical records:	-
Confirmations of recent records:	-
Current number of grid records:	12 **(+9%)**

Grids with records of 2015:
E24

Species: ***Poa turfosa*** Litv.
Family: Poaceae
Red lists: no

Number of grid records (pre-2015):	3
Number of grid records in 2015:	4
New records:	3
Confirmations of historical records:	1
Confirmations of recent records:	-
Current number of grid records:	6 **(+100%)**

Grids with records of 2015:
E24
Ж24
O8
T9

Species: ***Festuca polesica*** Zapał.
Family: Poaceae
Red lists: no

Number of grid records (pre-2015):	13
Number of grid records in 2015:	1
New records:	-
Confirmations of historical records:	-
Confirmations of recent records:	1
Current number of grid records:	13

Grids with records of 2015:
E24

Species: ***Arenaria saxatilis*** L.
Family: Caryophyllaceae
Red lists: Red Data Book of Vladimir Oblast (status: 3)

Number of grid records (pre-2015):	9
Number of grid records in 2015:	1
New records:	-
Confirmations of historical records:	-
Confirmations of recent records:	1
Current number of grid records:	9

Grids with records of 2015:
E24

Species: ***Silene borysthenica*** (Gruner) Walters
Family: Caryophyllaceae
Red lists: no

Number of grid records (pre-2015):	20
Number of grid records in 2015:	1
New records:	-
Confirmations of historical records:	1
Confirmations of recent records:	-
Current number of grid records:	20

Grids with records of 2015:
Ж24

Species: ***Eleocharis mamillata*** (H. Lindb.) H. Lindb.
Family: Cyperaceae
Red lists: Red Data Book of Vladimir Oblast (status: 3).

Number of grid records (pre-2015):	16
Number of grid records in 2015:	1
New records:	1
Confirmations of historical records:	-
Confirmations of recent records:	-
Current number of grid records:	17 **(+6%)**

Grids with records of 2015:
К12

Conclusions

1. Numerous records of rare species were made in grid squares formerly known as areas with the highest concentration of rare plant species. There were almost no records in 2015 of rare plant species in the grid squares with no earlier records.

2. 76 grid records out of 126 (61%) were new, although the general rate of new grid records in 2015 for all plant species was 25.2%. This confirms that rare plant species should be searched on purpose repeatedly.

3. The areas with the highest concentration of rare plant species are situated mainly along the major rivers where deep valleys harbours large diversity of ecotopes, including localities of rare species.