

Dynamics and breeding success of Aquatic Warbler in key breeding sites in Belarus

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Study sites



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Dynamics of males' densities and influencing factors

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Main recommendations for management

Modern study of Aquatic Warbler population (1995 - 2006)

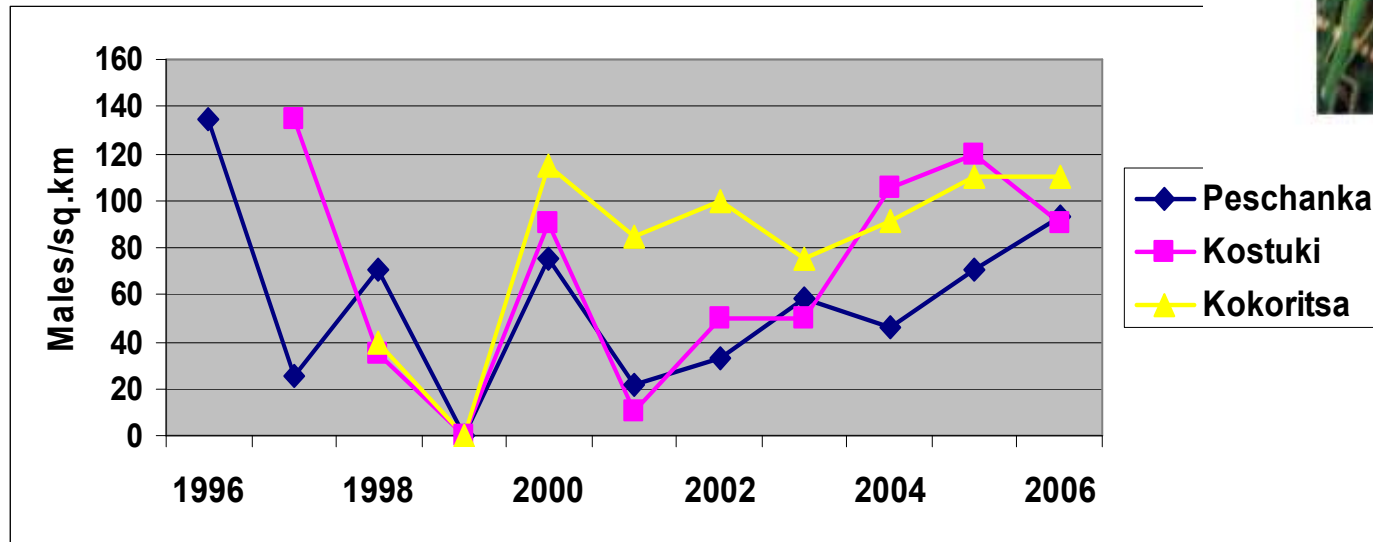
- Complex investigations of mires' ecosystem (water, soil, vegetation, insects, birds)**
- Monitoring of density and main environment factors (6 monitoring plots)**
- The timing of breeding was determined for 202 nests and nest arrangement patterns have been described for 179 nests**
- Monitoring of breeding success and causes of nests mortality (164 nests)**

Main characteristics of study sites

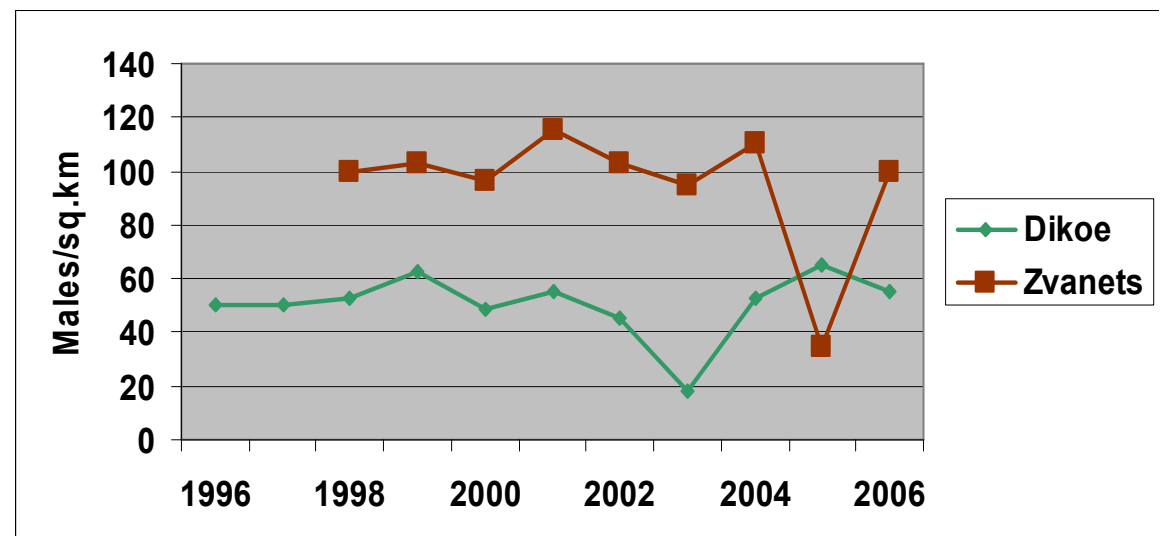
Plant Association	Fens				
	Dikoe	Sporovo			Zvanets
	Vibrody	Kostuki	Kokorit sa	Pesch anka	Povitie
Water mineralisation, mg/l	106	145	163	289	347
<i>Caricetum elatae</i>	9.6	13.5	38	89.1	58
<i>C. appropinquatae</i>	4.5	81.1	13	0	37
<i>C. rostratae</i>	0	0	2,9	4,5	0
<i>C. diandrae</i>	3.9	0	0	0	0
<i>C. lasiocarpae</i>	45	5.2	39	0	0
<i>C. limosae</i>	16.4	6.5	0	0	0
<i>Phragmitetum communis</i>	5.9	0	0	4.5	0.2

Monitoring of AW males' densities on 5 plots

Sporovo

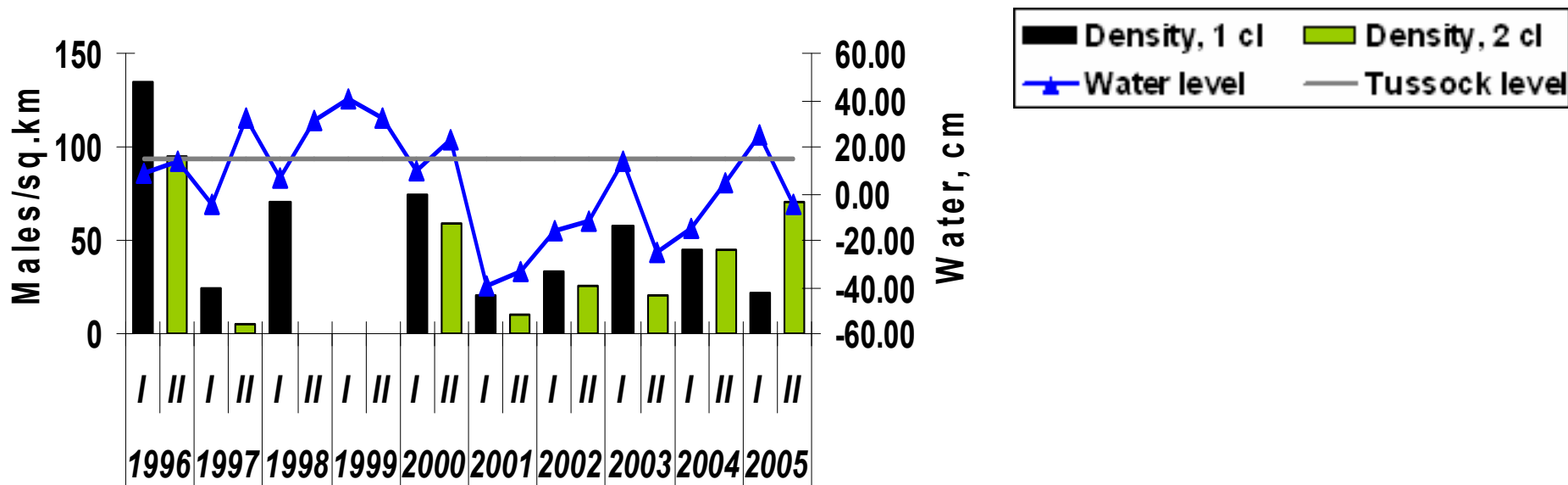


Dikoe and Zvanets

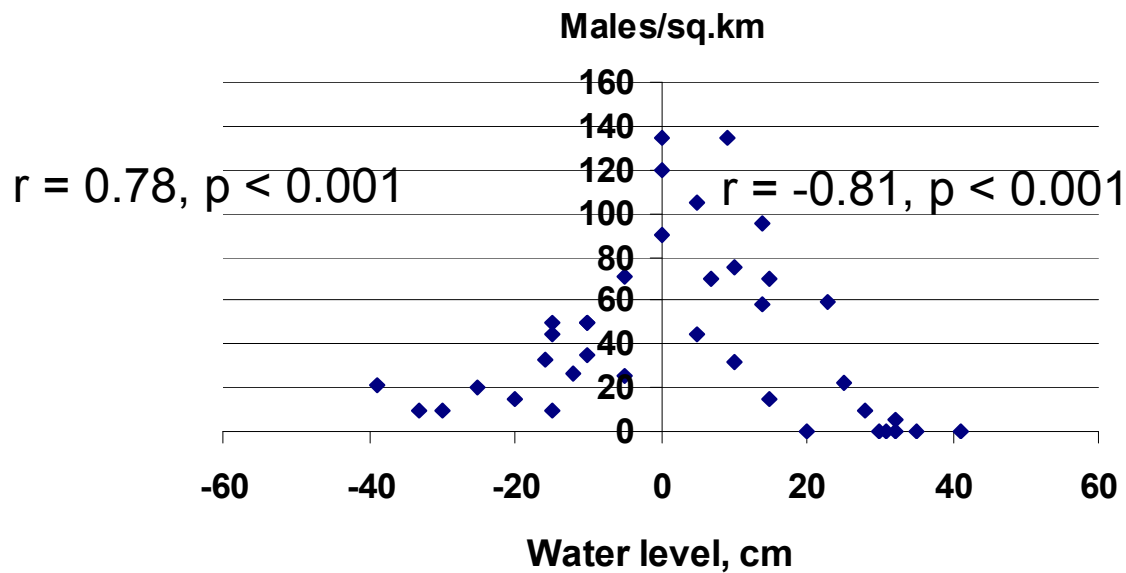


Impact of water level on males' density on Sporovo mire

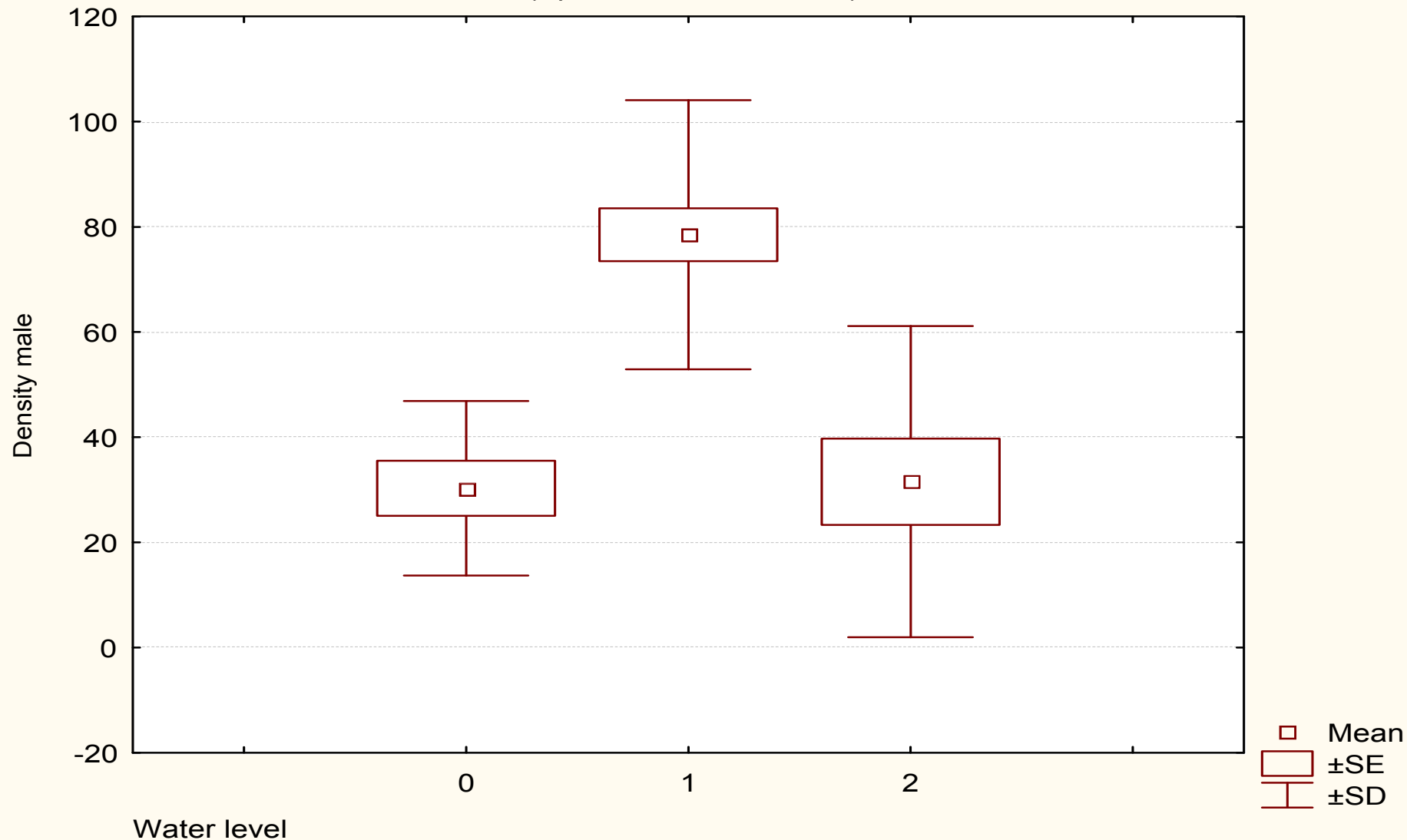
Sporovo, Peschanka plot



Clutch/Year

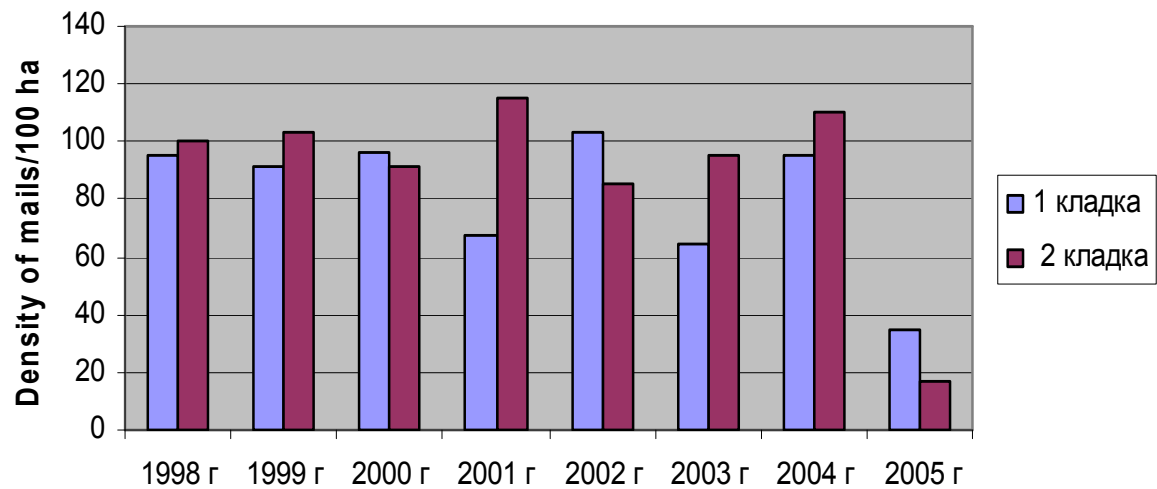


Box Plot (Spreadsheet1 10v*92c)



Relation of males' density during first clutch and water level on mire.
Water levels: 0: 10 cm and more below soil level; 1: from -9 till +19 cm (below tussocks); 2: 20-55 cm above soil level (higher than the tussocks)

Zvanets



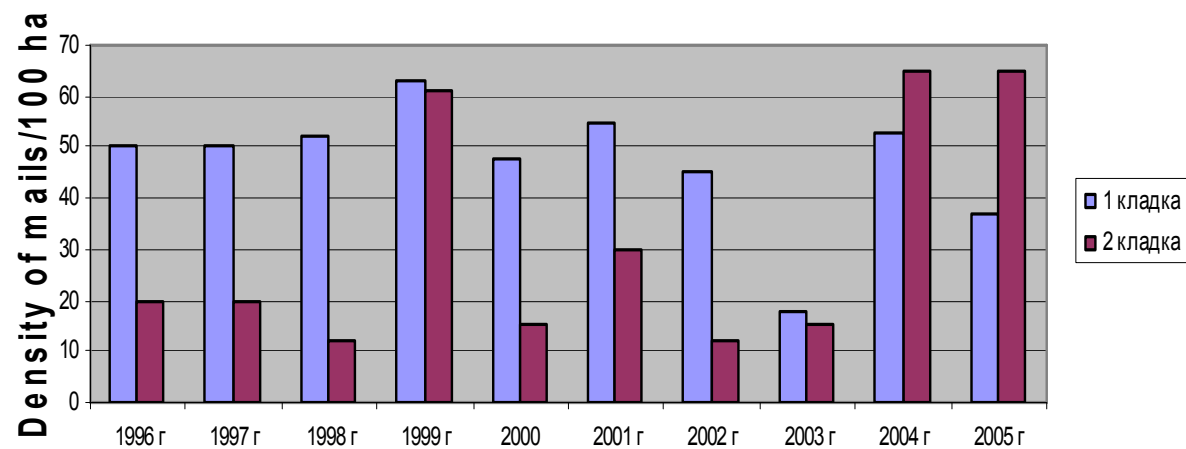
Favorable years:

- males' density in may is higher than in July

Unfavorable years:

- density in May is lower than in July

Dikoe



Environment factors influencing the species density

- **Water level changes during breeding season**
- **Abundance and state of old dry vegetation**
- **Abundance and state of green vegetation**

ling condition 1:

er level close to the soil surface,

% of dry vegetation (only last-year vegetation),

elopment of green vegetation is near 100%

ity of AW males is high





Breeding condition 2:

- dry vegetation is absent,
- water level is close to the soil surface,
- development of green vegetation is incomplete
- nest placement possible in the burnt holes and burrows of tussocks

Density of males – medium

Breeding condition 3

- **dry vegetation is absent,**
- **water level close to the soil surface,**
- **green vegetation is completely developed,**
- **nest placement possible under green vegetation alone**



Breeding condition 4

- water level is at tussock top level,
- green vegetation is 100% developed,
- nesting is possible above water when dry vegetation is abundant

Density of males - medium

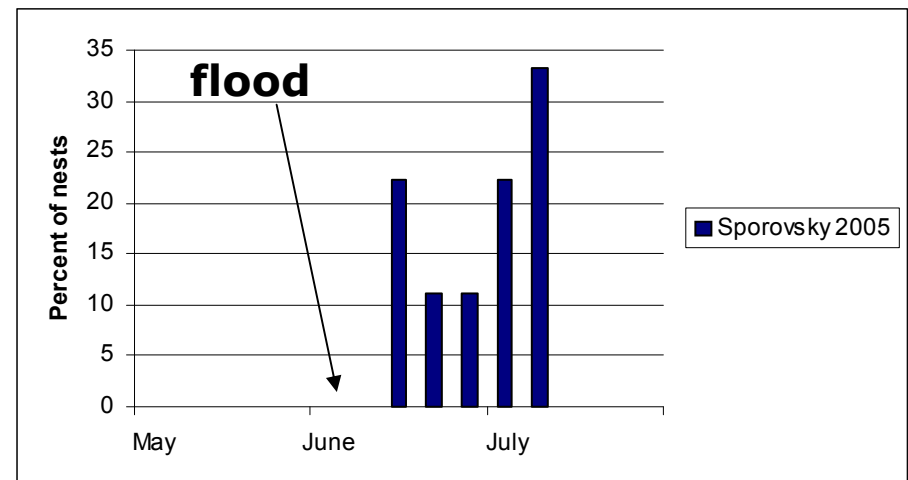
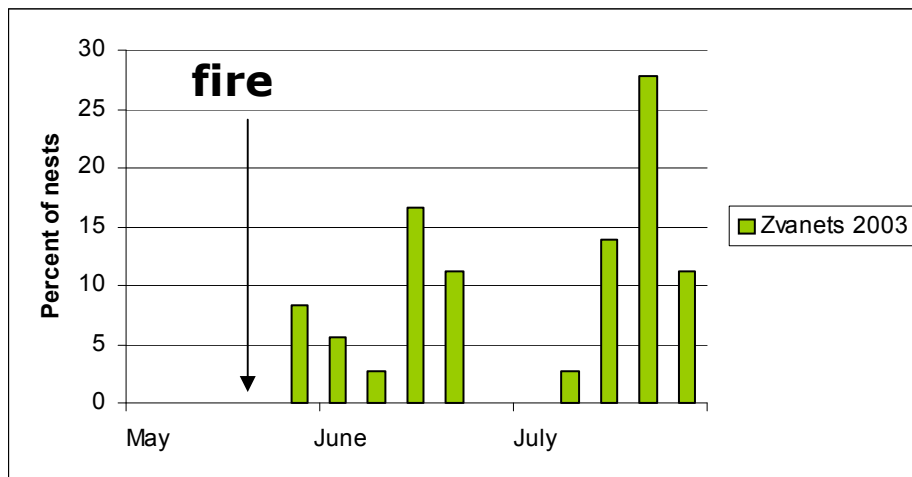
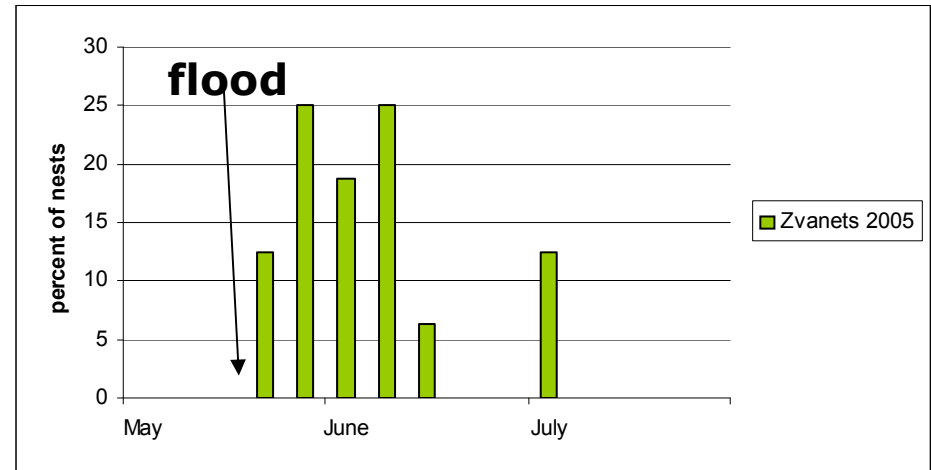
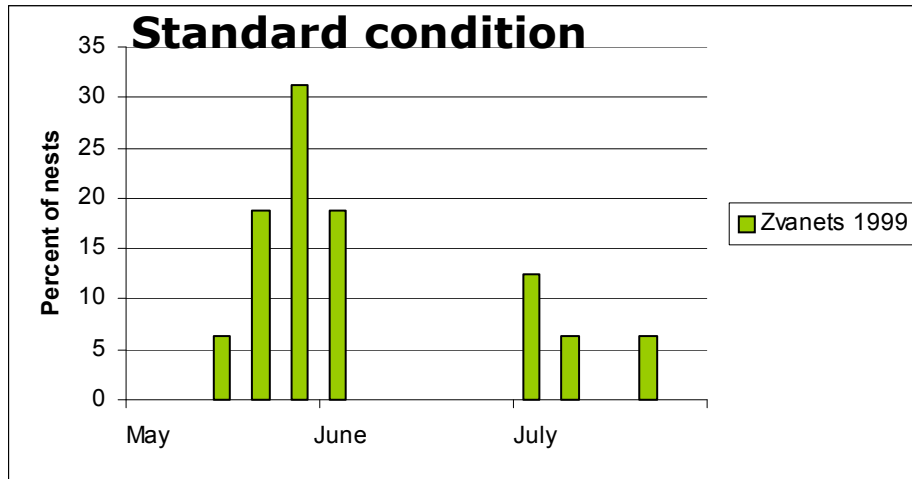
Sporovo, May 2001

Breeding condition 5

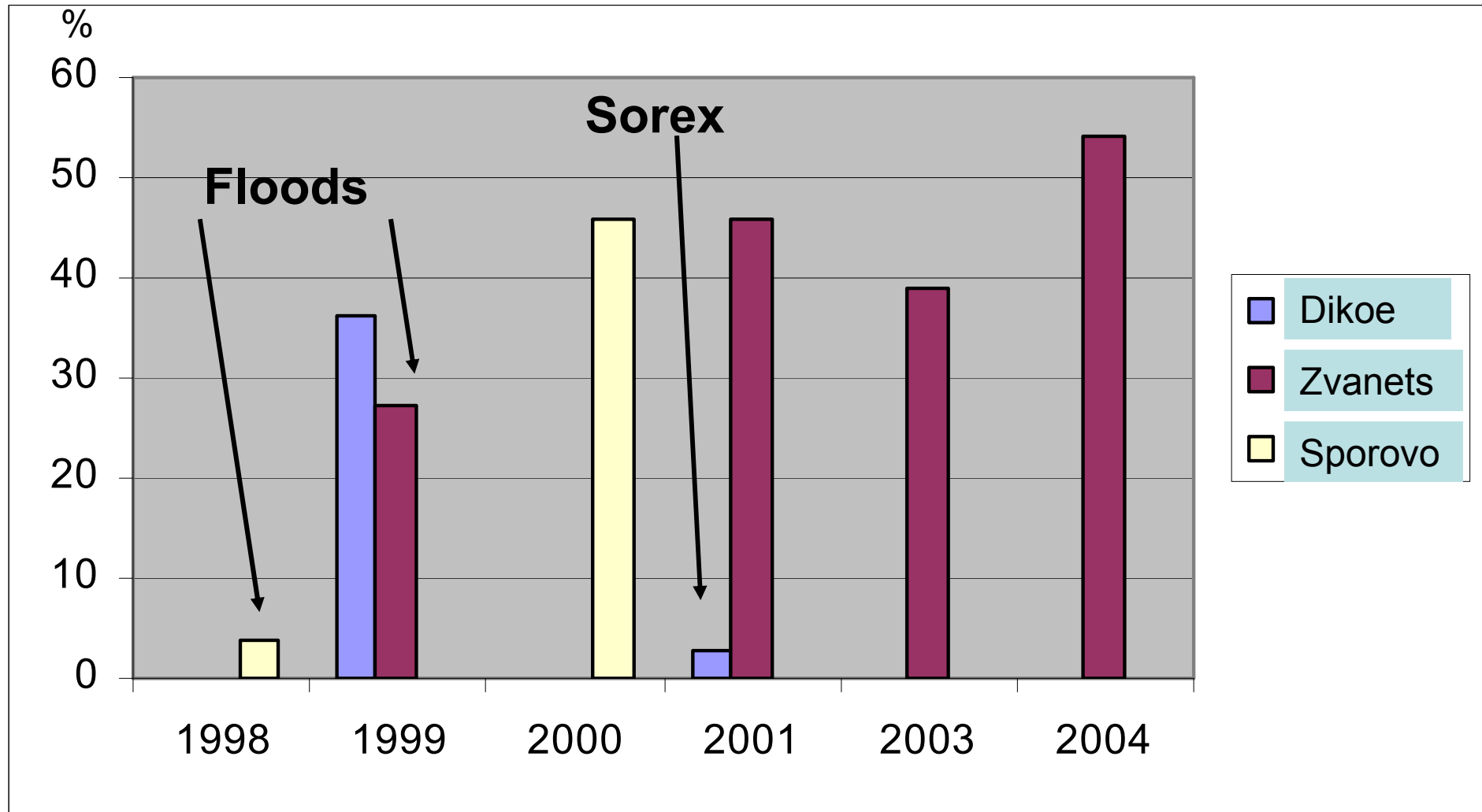
- **dry vegetation is 200%,**
- **the water level 10-30 cm below to the soil surface,**
- **green vegetation incompletely developed**

Density of males – 21 (low)

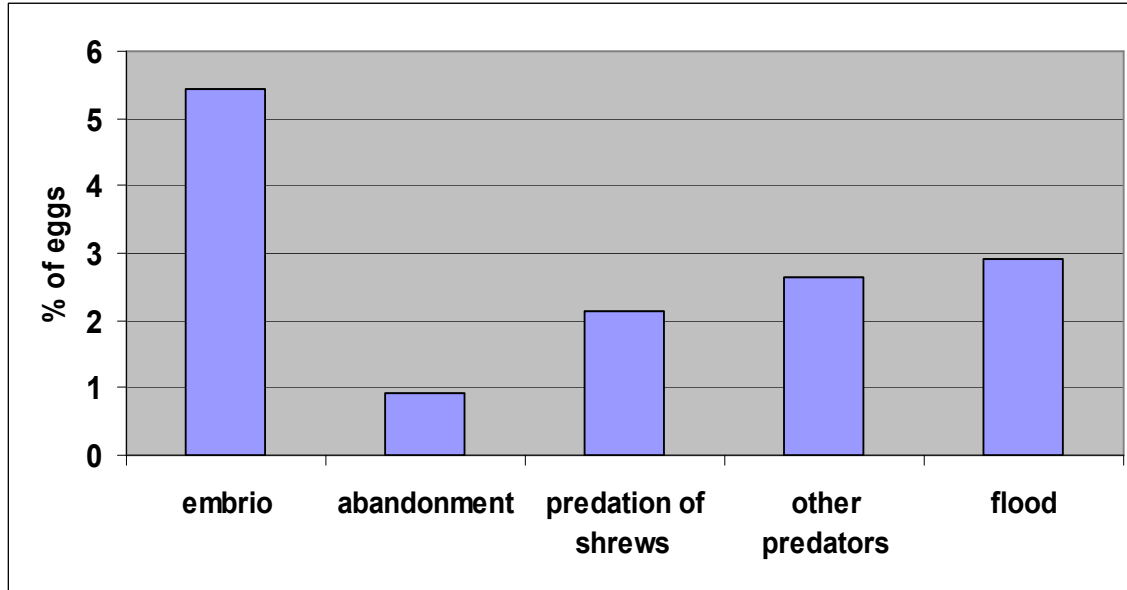
Изменение сроков размножения



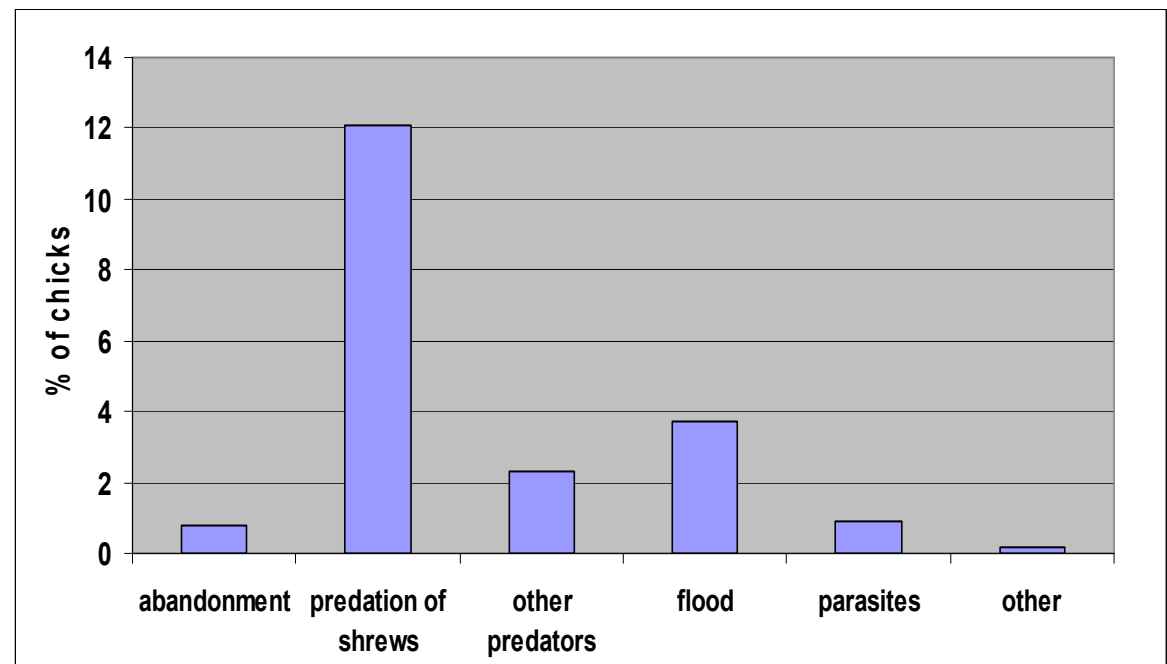
Dynamics of breeding success of AW, %



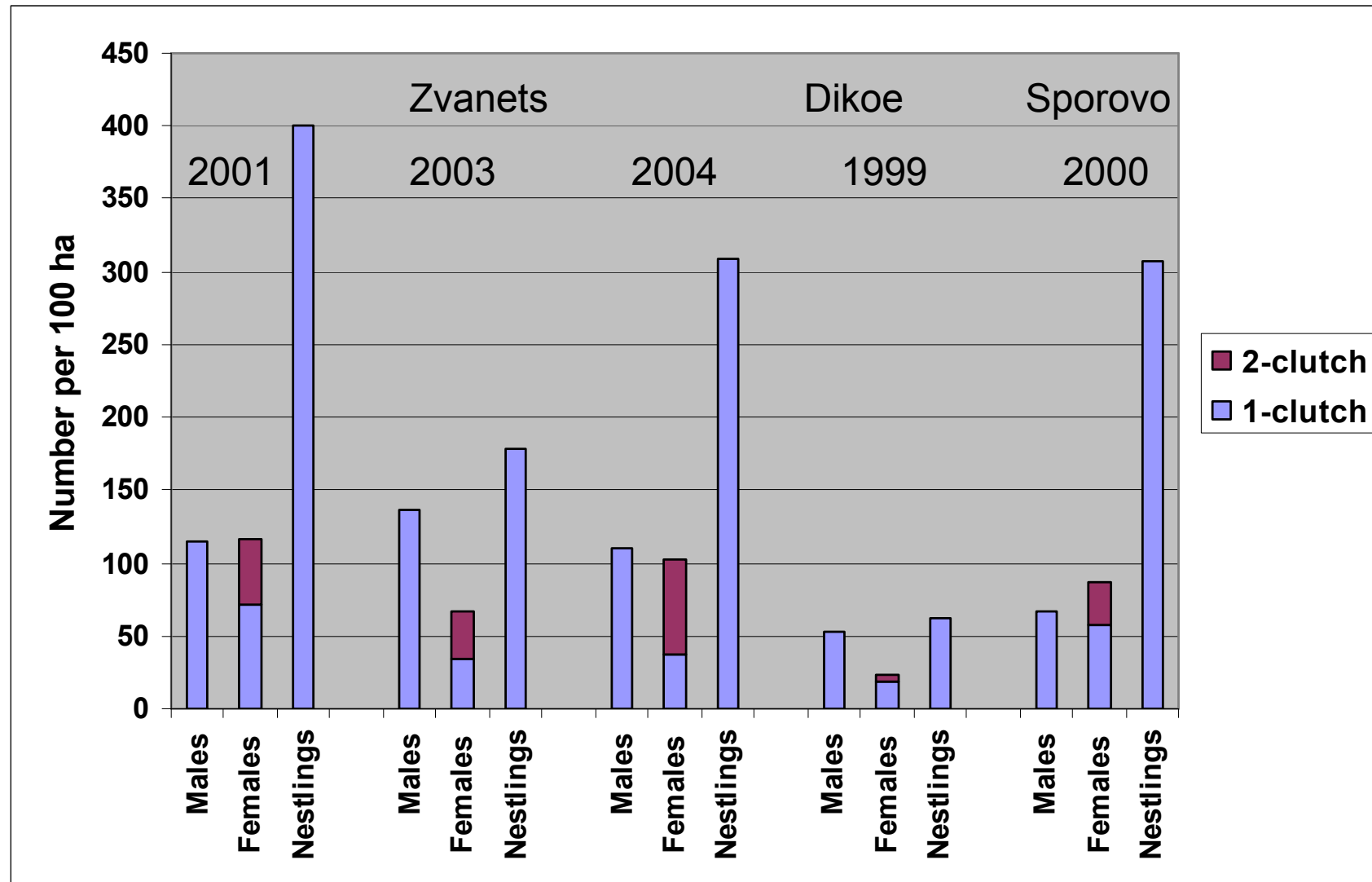
Losses of eggs, n=753



Losses of chicks, n=647



Habitat productivity of Zvanets mire (density of males, females 1 & 2-clutch, fledging nestlings per 100 ha)



Main adaptations of AW to unfavorable environment factors (fires, floods, droughts)

The ability to change nest arrangement patterns

The ability to vary the timing of breeding within a long period

The ability to nest on more favorable plots with increased density

The ability to move from places less favorable for breeding to more favorable parts of mire (up to 20 km)

Based on adaptation studies of the Aquatic Warbler, key recommendations have been developed regarding habitat management of this globally endangered species:

Hydrological regime

It is needed to ensure a near-natural hydrological regime of habitats:

- In early spring (March – April) the water level should be above tussocks' level.**
- From mid-May to mid-/ late June the water level should be near the soil surface.**
- In July – August the level should be lower than the soil level.**

Key recommendations

Vegetation structure:

In order to support the normal vegetation structure when there is no scything going on, it is necessary to carry out *controlled burning or scything*.

The best time for burning old vegetation is in late autumn or winter, when old vegetation and moss cover wouldn't be burnt out completely. Burning yields the best results when the water freezes at the tussocks' level. As a result, only part of old vegetation burns out leaving normal conditions for early nesting disguises.

Controlled winter burning is the only method to prevent unwanted spring fires when there are no or late spring floods.