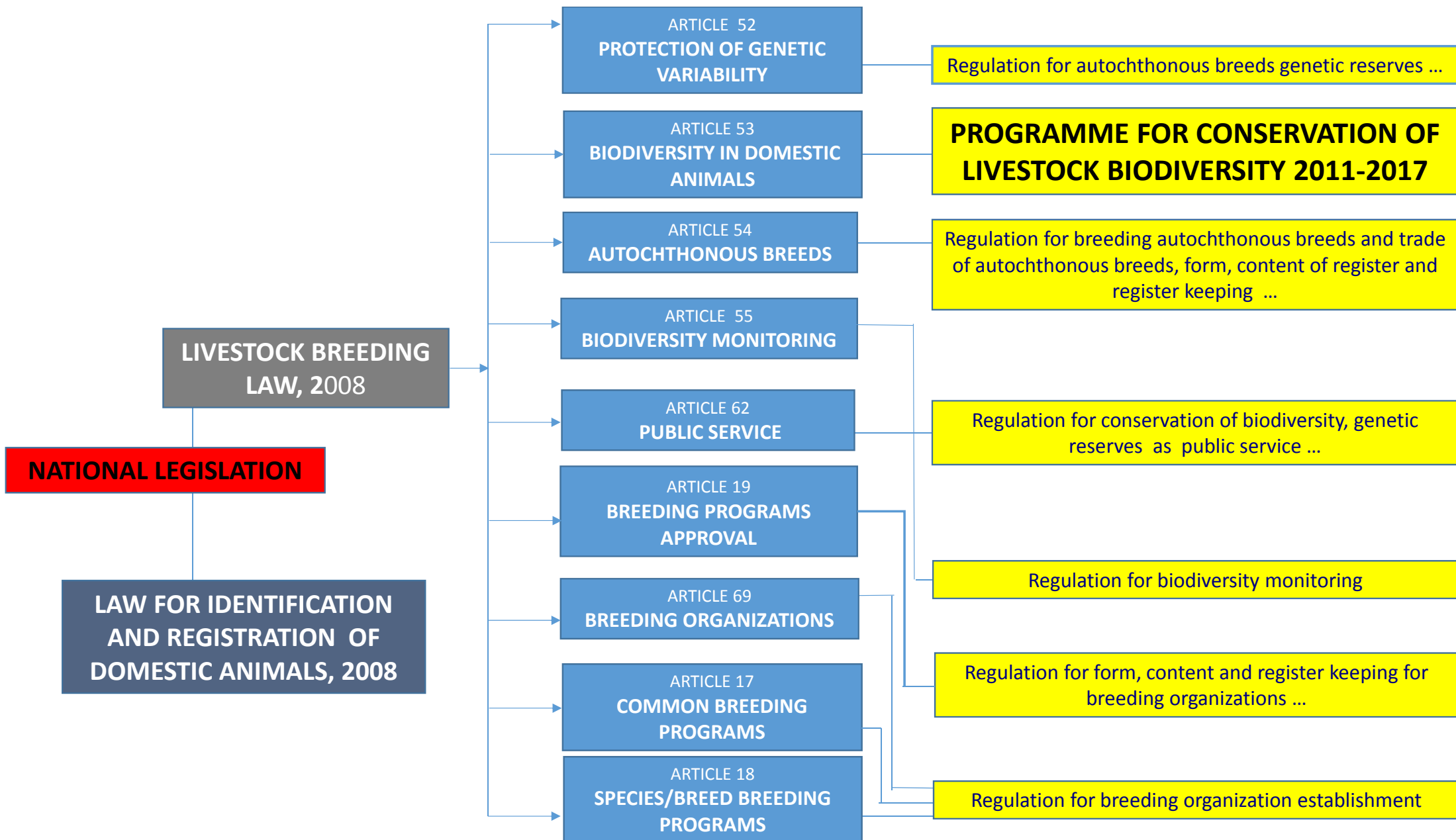
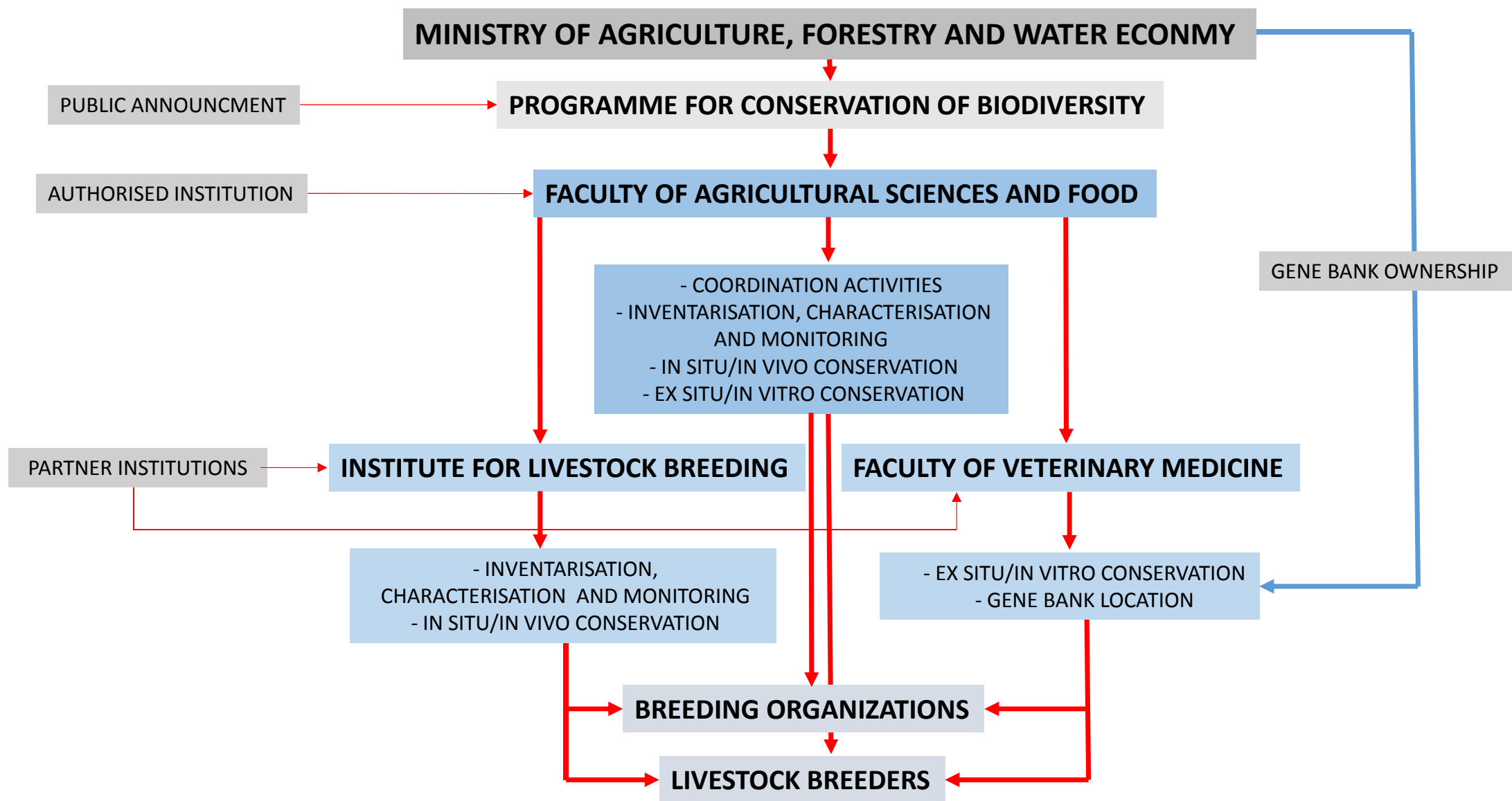


# ***In situ* and *Ex situ* gene conservation in Republic of Macedonia**

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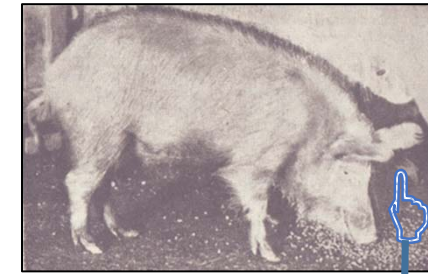




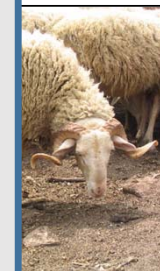
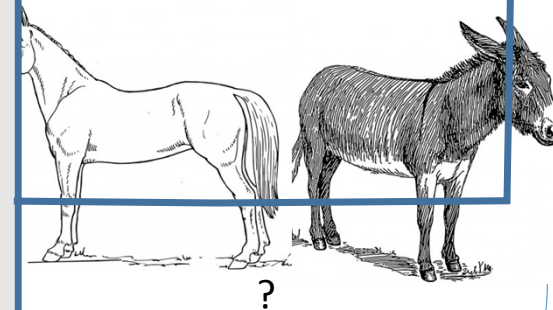
# AnGR Republic of Macedonia



✓ **FOUR LOCATIONS (LOCAL POPULATION) → "In-situ" →  
IMPROVED BREEDING CONDITIONS = DUROC**



ATTEMPTS TO FIND = 0 **EXTINCT ?**



ATTEMPTS TO FIND = 0 **EXTINCT ?**



< 90



# In situ – OVCEPOLIAN SHEEP

- Breeding organization, 2011
- 7 flocks = < 3500 heads (♀3047; ♂453)
- Breeding programme: 2011-2016 (to advanced)
- Subsidies

| Year | Per head | OP Sheep | Total |
|------|----------|----------|-------|
| 2014 | 15€      | 10€      | 25€   |
| 2015 | 15€      | 10€      | 25€   |

- Production traits-milk recording AT<sub>4</sub> method
- Genetic analysis: microsatellites, PrP genotyping



# Ex situ/In vitro – OVCHPOLIAN SHEEP

- 2014/2015= 9 donors/6676 straws
- Goal =  $\geq 50$  donors in next five years



037



847



064



055



977



019



046



369



934

| Year                         | Breed        | Ram number | Straws      |
|------------------------------|--------------|------------|-------------|
| 2014                         | OPSh         | <u>037</u> | 41          |
|                              | OPSh         | <u>046</u> | 1091        |
|                              | OPSh         | <u>055</u> | 758         |
|                              | OPSh         | <u>064</u> | 625         |
|                              | OPSh         | <u>369</u> | 255         |
|                              | <b>TOTAL</b> | <b>5</b>   | <b>2770</b> |
| <b>CONSERVATION OF SEMEN</b> |              |            |             |
| 2015                         | OPSh         | 847        | 502         |
|                              | OPSh         | 934        | 186         |
|                              | OPSh         | 977        | 538         |
|                              | OPSh         | <u>037</u> | 617         |
|                              | OPSh         | <u>046</u> | 279         |
|                              | OPSh         | <u>055</u> | 660         |
|                              | OPSh         | <u>064</u> | 395         |
|                              | OPSh         | <u>369</u> | 447         |
|                              | OPSh         | 019        | 282         |
|                              | <b>TOTAL</b> | <b>9</b>   | <b>3906</b> |

# Ex situ/In vitro – OVCHÉPOLIAN SHEEP

## CONSERVATION OF OOCYTES

| Year | Breed        | Individual number | N of oocytes | Frozen oocytes | Rejected oocytes |
|------|--------------|-------------------|--------------|----------------|------------------|
| 2014 | OPSh         | 116309592         | 4            | 3              | 1                |
|      | OPSh         | 112753564         | 6            | 5              | 1                |
|      | OPSh         | 136339041         | 7            | 3              | 4                |
|      | OPSh         | 136338778         | 8            | 8              | 0                |
|      | <b>Total</b> | <b>4</b>          | <b>25</b>    | <b>19</b>      | <b>6</b>         |

- Goal = in next five years, 50 donors,



# Ex situ/In vitro – OVCEPOLIAN SHEEP

| CONSERVATION OF EMBRYOS |              |                   |               |              |                      |
|-------------------------|--------------|-------------------|---------------|--------------|----------------------|
| Year                    | Breed        | Individual number | Corpus luteum | N of embryos | Unfertilized Oocytes |
| 2014                    | OPSh         | 116309592         | 3             | 3            | 0                    |
|                         | OPSh         | 112753564         | 4             | 3            | 1                    |
|                         | OPSh         | 136339041         | 2             | 1            | 0                    |
|                         | OPSh         | 136338778         | 2             | 2            | 0                    |
|                         | <b>TOTAL</b> | <b>4</b>          | <b>13</b>     | <b>9</b>     | <b>1</b>             |

- SUCCESS = 0
- Goal = in next 7 years =  $\geq 7$  donors,  $\geq 5$  embryos



# Ex situ-KARAKACHANIAN SHEEP

## Ex situ/In vivo

- State owned flocks:
  - I flock = 40 animals =1999-2004
  - II flock = 35 animals = 1999-2004
- 2005 merged flocks = 40 animals
- Ex situ/In vivo =INBREEDING
- Research grant = 2015/2016= new flock/s
- No breeding organization
- 4 flocks = < 100 heads



## Ex situ/In vitro

| CONSERVATION OF SEMEN |              |            |            |
|-----------------------|--------------|------------|------------|
| Year                  | Breed        | Ram number | Straws     |
| 2015                  | KARSh        | 9688       | 32         |
|                       | KARSh        | 3508       | 23         |
|                       | KARSh        | 9371       | 19         |
|                       | KARSh        | 0081       | 42         |
|                       | KARSh        | 0090       | 41         |
|                       | KARSh        | 5588       | 16         |
|                       | KARSh        | 5551       | 31         |
|                       | <b>TOTAL</b> | <b>7</b>   | <b>204</b> |



# In situ - DOMESTIC BALKAN GOAT

- Breeding organization - 2012
- Breeding programme (2012-2017)
- 10 flocks = 2500 heads
  - ♀ = 2149 ♂ = 351
- Production traits-milk recording AT<sub>4</sub> method
- Subsidies

| Year | Per head | DBGoat | Total |
|------|----------|--------|-------|
| 2015 | 15€      | 10€    | 25€   |



# Ex situ/In vitro- DOMESTIC BALKAN GOAT

| CONSERVATION OF SEMEN                |              |                  |           |
|--------------------------------------|--------------|------------------|-----------|
| Year                                 | Breed        | Goat number      | Straws    |
| 2014<br><br>Farm number<br>238100282 | DBGo         | 122661688        | 9         |
|                                      | DBGo         | <u>113380462</u> | 11        |
|                                      | DBGo         | <u>122661527</u> | 6         |
|                                      | DBGo         | 120759855        | 6         |
|                                      | DBGo         | 114125233        | 13        |
|                                      | DBGo         | 122661703        | 7         |
|                                      | <b>TOTAL</b> | <b>6</b>         | <b>52</b> |

- 2014/2015 = 19 donor = 569 straws
- Goal =  $\geq 50$  donors in next five years



| CONSERVATION OF SEMEN |              |                  |            |                          |
|-----------------------|--------------|------------------|------------|--------------------------|
| Year                  | Breed        | Goat number      | Straws     | Location                 |
| 2015                  | DBGo         | <u>113380462</u> | 42         | Farm number<br>238100282 |
|                       | DBGo         | <b>120759721</b> | 31         |                          |
|                       | DBGo         | <b>120779798</b> | 26         |                          |
|                       | DBGo         | <b>122661314</b> | 36         |                          |
|                       | DBGo         | <u>122661527</u> | 23         |                          |
|                       | DBGo         | <b>126164800</b> | 27         | Farm number<br>235600587 |
|                       | DBGo         | 131184422        | 28         |                          |
|                       | DBGo         | 120628388        | 33         |                          |
|                       | DBGo         | 120628397        | 36         |                          |
|                       | DBGo         | 121352950        | 43         |                          |
|                       | DBGo         | 127603324        | 47         | Farm number<br>300013980 |
|                       | DBGo         | <b>124513312</b> | 38         |                          |
|                       | DBGo         | <b>120756946</b> | 35         |                          |
|                       | DBGo         | <b>124469330</b> | 38         |                          |
|                       | DBGo         | <b>124469428</b> | 24         |                          |
|                       | <b>TOTAL</b> | <b>15</b>        | <b>517</b> |                          |

# In situ/Ex situ conservation - BUSHA CATTLE

## In situ

- Breeding organization – 2011
- Members = 42 breeders

| ♀   | ♂  | Total |
|-----|----|-------|
| 654 | 66 | 720   |

- Breeding program (2011-2016)
- Subsidies

| Year | Per head | Busha | Total |
|------|----------|-------|-------|
| 2013 | 50€      | 25€   | 75€   |
| 2015 | 50€      | 25€   | 75€   |

## Ex situ - In vitro

| CONSERVATION OF SEMEN |              |             |            |          |
|-----------------------|--------------|-------------|------------|----------|
| Year                  | Breed        | Bull number | Straws     | Location |
| 2014                  | BUSCa        | 7895        | 120        | I        |
|                       | BUSCa        | 7896        | 130        |          |
|                       | BUSCa        | 19230177    | 103        | II       |
|                       | BUSCa        | 19230269    | 105        |          |
|                       | <b>TOTAL</b> | <b>4</b>    | <b>458</b> |          |
|                       |              |             |            |          |
| 2015                  | BUSCa        | 4267        | 122        | III      |
|                       | BUSCa        | 7832        | 138        |          |
|                       | BUSCa        | 19230177    | 149        | II       |
|                       | BUSCa        | 19230269    | 136        |          |
|                       | <b>TOTAL</b> | <b>4</b>    | <b>545</b> |          |

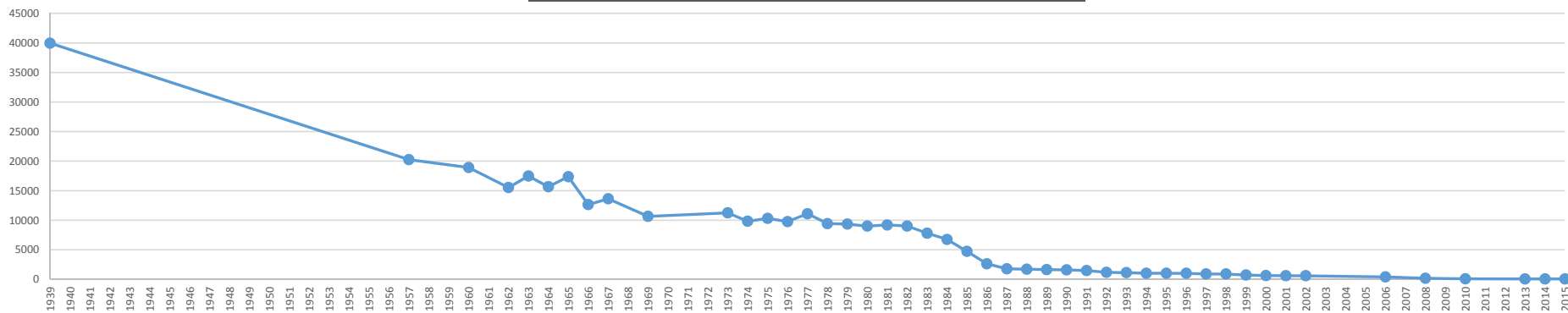


# Buffalo – Conservation activities

- No breeding organization
- No breeding programme
- No In situ/Ex situ activities
- Fresh blood = 25 samples

| National Biodiversity Programme - Inventory and Characterization |          |           |           |          |           |           |
|------------------------------------------------------------------|----------|-----------|-----------|----------|-----------|-----------|
| LOCATION                                                         | n ♀      | n ♂       | 2014      | n ♀      | n ♂       | 2015      |
| 1                                                                | 3        | 25        | 28        | 3        | 23        | 26        |
| 2                                                                | 1        | 15        | 16        | 1        | 15        | 16        |
| 3                                                                | 2        | 5         | 7         | 2        | 5         | 7         |
| 4                                                                | 0        | 2         | 2         | 0        | 4         | 4         |
| 5                                                                | 0        | 4         | 4         | 0        | 4         | 4         |
| 6                                                                | 0        | 3         | 3         | 0        | 0         | 0         |
| 7                                                                | 0        | 4         | 4         | 0        | 0         | 0         |
| <b>Total</b>                                                     | <b>6</b> | <b>58</b> | <b>64</b> | <b>6</b> | <b>51</b> | <b>57</b> |

Trend in Buffalo breeding (1939-2015)



# CONCLUSIONS AND FUTURE ACTIVITIES

- CAPACITIES FOR CONSERVATION ACTIVITIES
  - LEVEL OF PERFORMED ACTIVITIES
  - BREEDERS ARE INTERESTED
  - FUNDS FOR 2016
- 
- REVISION/REVIEW OF RESULTS AND ACTIVITIES
  - DATA KEEPING SOFTWARE
  - NEW PROGRAMME FOR CONSERVATION OF ANGr 2017-2014
    - DEVELOPMENT OF BREED SPECIFIC NEEDS/BREED ORIENTED



Thank you for your attention

