**Appendix S2.** Confirmed dispersal between and inside wolf populations in Europe (see also Fig. 1).

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|  | **Direction of gene flow** | **Study** |
| 1 | Between subpopulations in Italian peninsular population | Fabbri *et al*. (2007, 2014) |
| 2 | Between Italian peninsular and Alpine population | Fabbri *et al*. (2007, 2014) |
| 3 | Between Alpine population and Dinaric-Balkan population | Fabbri *et al.* (2014) |
| 4 | From Italian wolf population to France and Spain (Catalonia) | Sastre (2011) |
| 5 | From Central European Lowland population to Belarus | Schede *et al.* (2010) |
| 6 | From Central European Lowland population to Czech Republic | Reinhardt *et al.* (2015) |
| 7 | From Central European Lowland population to Denmark | Andersen *et al.* (2015) |
| 8 | From Baltic to Central European Lowland population | Czarnomska *et al.* (2013) |
| 9 | From Scandinavian population to Karelian population | Wabakken *et al.* (2007) |
| 10 | From Karelian or Russian population to Scandinavian population | Seddon *et al.* (2006) |
| 11 | Between Karelian (Finland) and Russia | Aspi *et al.* (2009) |
| 12 | Between Dinaric-Balkan (Serbia and Bulgaria) and Carpathian population | Bakan *et al*.(2014) |