Table S3. Levels of gene flow within and between the four American flyways. These estimates were independently inferred using both the parsimony (σ) and maximum likelihood (ML) methods (*q*). PF, CF, MF and AF denote the Pacific flyway, Central flyway, Mississippi flyway and Atlantic flyway, respectively. Each estimate was inferred from 200 randomly selected ML bootstrap phylogenies. Higher and lower 95% confidence intervals are shown in parenthesis. All estimates are non-directional.

Method	Gene data set[1]	From / To	To / From			
			PF	CF	MF	AF
Pars. 4-flyway (σ)	PB2	PF	0.268 (0.258-0.28)	0.144 (0.131-0.156)	0.099 (0.092-0.106)	0.029 (0.025-0.033)
		CF	0.144 (0.131-0.156)	0.109 (0.076-0.156)	0.273 (0.258-0.296)	0.036 (0.026-0.05)
		MF	0.099 (0.092-0.106)	0.273 (0.258-0.296)	0.272 (0.247-0.3)	0.112 (0.105-0.119)
		AF	0.029 (0.025-0.033)	0.036 (0.026-0.05)	0.112 (0.105-0.119)	0.143 (0.133-0.151)
	PB1	PF	0.287 (0.274-0.3)	0.136 (0.12-0.15)	0.101 (0.094-0.11)	0.014 (0.012-0.019)
		CF	0.136 (0.12-0.15)	0.091 (0.046-0.15)	0.266 (0.247-0.294)	0.036 (0.03-0.043)
		MF	0.101 (0.094-0.11)	0.266 (0.247-0.294)	0.262 (0.237-0.286)	0.125 (0.117-0.132)
		AF	0.014 (0.012-0.019)	0.036 (0.03-0.043)	0.125 (0.117-0.132)	0.153 (0.144-0.162)
	PA (lineage B)	PF	0.226 (0.219-0.239)	0.084 (0.072-0.101)	0.103 (0.093-0.11)	0.015 (0.012-0.02)
		CF	0.084 (0.072-0.101)	0.035 (0.021-0.101)	0.444 (0.41-0.478)	0.021 (0.012-0.032)
		MF	0.103 (0.093-0.11)	0.444 (0.41-0.478)	0.371 (0.339-0.406)	0.127 (0.119-0.137)
		AF	0.015 (0.012-0.02)	0.021 (0.012-0.032)	0.127 (0.119-0.137)	0.18 (0.168-0.19)
	PA (lineage A)	PF	0.338 (0.314-0.364)	0.111 (0.095-0.13)	0.14 (0.125-0.154)	0.025 (0.019-0.032)
		CF	0.111 (0.095-0.13)	0.035 (0.006-0.057)	0.34 (0.307-0.378)	0.031 (0.017-0.044)
		MF	0.14 (0.125-0.154)	0.34 (0.307-0.378)	0.41 (0.37-0.458)	0.091 (0.083-0.106)
		AF	0.025 (0.019-0.032)	0.031 (0.017-0.044)	0.031 (0.017-0.044)	0.116 (0.109-0.127)
	NP	PF	0.349 (0.337-0.363)	0.177 (0.157-0.196)	0.082 (0.069-0.096)	0.035 (0.03-0.04)
		CF	0.177 (0.157-0.196)	0 (0-0.124)	0.372 (0.317-0.418)	0.06 (0.04-0.082)
		MF	0.082 (0.069-0.096)	0.372 (0.317-0.418)	0.495 (0.442-0.557)	0.174 (0.16-0.19)
		AF	0.035 (0.03-0.04)	0.06 (0.04-0.082)	0.174 (0.16-0.19)	0.165 (0.154-0.177)
	MP	PF	0.313 (0.283-0.345)	0.119 (0.095-0.143)	0.114 (0.101-0.158)	0.028 (0.021-0.037)
		CF	0.119 (0.095-0.143)	0.19 (0.137-0.285)	0.246 (0.212-0.281)	0.046 (0.03-0.073)
		MF	0.114 (0.101-0.158)	0.246 (0.212-0.281)	0.342 (0.284-0.398)	0.139 (0.125-0.155)
		AF	0.028 (0.021-0.037)	0.046 (0.03-0.073)	0.139 (0.125-0.155)	0.156 (0.143-0.172)

NS (allele A)	PF	0.493 (0.448-0.536)	0.136 (0.103-0.174)	0.094 (0.069-0.128)	0.046 (0.035-0.057)
	CF	0.136 (0.103-0.174)	n.a.	0.382 (0.284-0.46)	0.153 (0.108-0.195)
	MF	0.094 (0.069-0.128)	0.382 (0.284-0.46)	0.364 (0.283-0.456)	0.193 (0.17-0.223)
	AF	0.046 (0.035-0.057)	0.153 (0.108-0.195)	0.193 (0.17-0.223)	0.228 (0.206-0.254)
NS (allele B)	PF	0.27 (0.229-0.324)	0.218 (0.169-0.26)	0.098 (0.07-0.125)	0.036 (0.023-0.051)
	CF	0.218 (0.169-0.26)	0.321 (0.079-0.566)	0.331 (0.249-0.445)	0.089 (0.055-0.119)
	MF	0.098 (0.07-0.125)	0.331 (0.249-0.445)	0.384 (0.264-0.536)	0.151 (0.125-0.181)
	AF	0.036 (0.023-0.051)	0.089 (0.055-0.119)	0.151 (0.125-0.181)	0.195 (0.157-0.229)
HA (H3)	PF	0.246 (0.213-0.25)	0.16 (0.137-0.187)	0.038 (0.026-0.05)	0 (0-0)
	CF	0.16 (0.137-0.187)	0.074 (0.02-0.115)	0.323 (0.292-0.352)	0 (0-0.019)
	MF	0.038 (0.026-0.05)	0.323 (0.292-0.352)	0.354 (0.287-0.439)	0.136 (0.101-0.15)
	AF	0 (0-0)	0 (0-0.019)	0.136 (0.101-0.15)	0.106 (0.104-0.108)
HA (H4)	PF	0.206 (0.163-0.242)	0.091 (0.074-0.116)	0.035 (0.022-0.053)	0.017 (0.017-0.018)
	CF	0.091 (0.074-0.116)	0.189 (0.128-0.26)	0.376 (0.341-0.407)	0.03 (0.022-0.043)
	MF	0.035 (0.022-0.053)	0.376 (0.341-0.407)	0.157 (0.137-0.249)	0.175 (0.157-0.186)
	AF	0.017 (0.017-0.018)	0.03 (0.022-0.043)	0.175 (0.157-0.186)	0.345 (0.314-0.363)
NA (N6)	PF	0.208 (0.186-0.239)	0.145 (0.108-0.18)	0.058 (0.037-0.077)	0.012 (0.01-0.028)
	CF	0.145 (0.108-0.18)	0.31 (0.037-0.513)	0.373 (0.328-0.425)	0.036 (0.002-0.045)
	MF	0.058 (0.037-0.077)	0.373 (0.328-0.425)	0.22 (0.15-0.285)	0.1 (0.086-0.12)
	AF	0.012 (0.01-0.028)	0.036 (0.002-0.045)	0.1 (0.086-0.12)	n.a.
NA (N8)	PF	0.66 (0.568-0.692)	0.144 (0.107-0.18)	0.042 (0.027-0.07)	0.051 (0.051-0.093)
	CF	0.144 (0.107-0.18)	0 (0-0.208)	0.245 (0.202-0.301)	0.005 (0-0.063)
	MF	0.042 (0.027-0.07)	0.245 (0.202-0.301)	0.525 (0.446-0.602)	0.359 (0.309-0.416)
	AF	0.051 (0.051-0.093)	0.005 (0-0.063)	0.359 (0.309-0.416)	n.a.
ML 4-flyway (*q*) PB2	PF	27.809 (25.096-31.048)	5.48 (4.89-6.907)	5.988 (5.216-6.844)	0.66 (0.133-1.018)
	CF	5.48 (4.89-6.907)	9.518 (5.269-18.582)	13.734 (12.116-16.585)	1.344 (0.491-2.804)
	MF	5.988 (5.216-6.844)	13.734 (12.116-16.585)	12.214 (9.829-14.596)	10.216 (9.259-11.502)
	AF	0.66 (0.133-1.018)	1.344 (0.491-2.804)	10.216 (9.259-11.502)	33.112 (29.108-38.158)
PB1	PF	34.627 (30.497-40.414)	8.638 (7.532-10.247)	5.231 (4.253-6.323)	0 (0-0.006)
	CF	8.638 (7.532-10.247)	8.842 (3.946-17.22)	18.888 (15.881-22.008)	1.205 (0.443-2.026)
	MF	5.231 (4.253-6.323)	18.888 (15.881-22.008)	12.295 (9.116-15.91)	11.897 (10.691-13.109)
	AF	0 (0-0.006)	1.205 (0.443-2.026)	11.897 (10.691-13.109)	35.283 (30.684-40.429)
PA (lineage B)	PF	11.139 (9.578-14.307)	3.328 (1.57-4.589)	4.016 (3.014-5.336)	0.183 (0-0.579)
	CF	3.328 (1.57-4.589)	0 (0-0)	15.329 (13.063-18.51)	0 (0-0.187)
	MF	4.016 (3.014-5.336)	15.329 (13.063-18.51)	28.96 (24.186-35.446)	7.745 (6.719-8.995)

	AF	0.183 (0-0.579)	0 (0-0.187)	7.745 (6.719-8.995)	19.386 (16.562-23.088)
PA (lineage A)	PF	44.081 (36.109-55.732)	1.066 (0-4.152)	6.848 (4.841-9.05)	0.289 (0-0.904)
	CF	1.066 (0-4.152)	1.644 (0-36.11)	16.894 (12.454-26.404)	2.273 (0-6.932)
	MF	6.848 (4.841-9.05)	16.894 (12.454-26.404)	9.17 (2.951-16.206)	3.553 (1.289-4.755)
	AF	0.289 (0-0.904)	2.273 (0-6.932)	3.553 (1.289-4.755)	24.245 (19.059-29.944)
NP	PF	22.503 (19.153-26.754)	3.999 (3.472-4.73)	0 (0-0.593)	1.155 (0.988-1.352)
	CF	3.999 (3.472-4.73)	0 (0-0)	11.697 (9.431-13.584)	0 (0-0.387)
	MF	0 (0-0.593)	11.697 (9.431-13.584)	39.994 (33.008-53.714)	6.641 (5.826-7.638)
	AF	1.155 (0.988-1.352)	0 (0-0.387)	6.641 (5.826-7.638)	18.88 (15.271-23.137)
MP	PF	29.862 (21.105-40.135)	5.474 (3.582-7.728)	4.86 (3.38-7.037)	0.728 (0.336-1.469)
	CF	5.474 (3.582-7.728)	3.928 (0-14.153)	17.374 (13.105-23.093)	1.455 (0-4.113)
	MF	4.86 (3.38-7.037)	17.374 (13.105-23.093)	35.258 (21.124-66.319)	9.344 (7.283-12.447)
	AF	0.728 (0.336-1.469)	1.455 (0-4.113)	9.344 (7.283-12.447)	22.73 (17.366-34.973)
NS (allele A)	PF	32.43 (24.45-46.05)	9.56 (3.81-14.60)	2.20 (0.69- 4.02)	0.28 (0-1.37)
	CF	9.56 (3.81-14.60)	n.a.	37.97 (21.30-69.50)	16.61 (7.84-28.45)
	MF	2.20 (0.69- 4.02)	37.97 (21.30-69.50)	37.09 (17.54-85.93)	13.47 (10.10-18.42)
	AF	0.28 (0-1.37)	16.61 (7.84-28.45)	13.47 (10.10-18.42)	54.37 (35.90-83.71)
NS (allele B)	PF	26.852 (18.948-43.387)	17.586 (10.898-30.56)	3.17 (0-9.544)	0.702 (0-2.214)
	CF	17.586 (10.898-30.56)	38.547 (0-1987.189)	36.99 (17.577-71.596)	0 (0-5.581)
	MF	3.17 (0-9.544)	36.99 (17.577-71.596)	41.7 (7.493-217.024)	18.022 (10.638-32.957)
	AF	0.702 (0-2.214)	0 (0-5.581)	18.022 (10.638-32.957)	3.239 (0-8.048)
HA (H3)	PF	13.293 (11.055-17.062)	6.85 (5.579-11.546)	0 (0-0)	0 (0-0)
	CF	6.85 (5.579-11.546)	4.302 (0-7.879)	4.857 (4.12-6.052)	0 (0-0)
	MF	0 (0-0)	4.857 (4.12-6.052)	15.856 (12.632-19.928)	4.187 (3.505-4.951)
	AF	0 (0-0)	0 (0-0)	4.187 (3.505-4.951)	3.753 (2.108-5.934)
HA (H4)	PF	18.126 (13.831-23.555)	6.779 (5.571-8.844)	0 (0-0)	0 (0-0)
	CF	6.779 (5.571-8.844)	0 (0-60.553)	37.733 (29.793-47.428)	0 (0-2.562)
	MF	0 (0-0)	37.733 (29.793-47.428)	0 (0-0)	7.377 (3.632-9.449)
	AF	0 (0-0)	0 (0-2.562)	7.377 (3.632-9.449)	29.021 (21.051-39.507)
NA (N6)	PF	19.101 (14.67-25.125)	5.425 (0.776-7.372)	0 (0-4.759)	0 (0-0)
	CF	5.425 (0.776-7.372)	0 (0-4.613)	27.527 (20.45-40.985)	0 (0-1.525)
	MF	0 (0-4.759)	27.527 (20.45-40.985)	0 (0-3.054)	5.273 (3.061-6.805)
	AF	0 (0-0)	0 (0-1.525)	5.273 (3.061-6.805)	n.a.
NA (N8)	PF	17.599 (13.516-31.95)	5.091 (3.781-6.549)	0 (0-0.004)	0 (0-1.981)

	CF	5.091 (3.781-6.549)	0 (0-0)	6.993 (6.033-8.44)	0 (0-0)
	MF	0 (0-0.004)	6.993 (6.033-8.44)	17.616 (14.661-24.855)	10.335 (8.557-13.067)
	AF	0 (0-1.981)	0 (0-0)	10.335 (8.557-13.067)	n.a.

			PF	CF+MF	AF
Pars. 3-flyway (σ)	PB2	PF	0.268 (0.258-0.28)	0.114 (0.108-0.119)	0.029 (0.025-0.033)
		CF+MF	0.114 (0.108-0.119)	0.256 (0.242-0.275)	0.087 (0.081-0.092)
		AF	0.029 (0.025-0.033)	0.087 (0.081-0.092)	0.143 (0.133-0.151)
	PB1	PF	0.287 (0.275-0.3)	0.112 (0.106-0.12)	0.014 (0.012-0.019)
		CF+MF	0.112 (0.106-0.12)	0.244 (0.229-0.264)	0.093 (0.089-0.099)
		AF	0.014 (0.012-0.019)	0.093 (0.089-0.099)	0.153 (0.144-0.162)
	PA (lineage B)	PF	0.226 (0.219-0.239)	0.097 (0.09-0.104)	0.015 (0.012-0.02)
		CF+MF	0.097 (0.09-0.104)	0.377 (0.352-0.404)	0.093 (0.087-0.101)
		AF	0.015 (0.012-0.02)	0.093 (0.087-0.101)	0.18 (0.168-0.19)
	PA (lineage A)	PF	0.338 (0.315-0.364)	0.13 (0.12-0.141)	0.025 (0.019-0.032)
		CF+MF	0.13 (0.12-0.141)	0.319 (0.297-0.349)	0.068 (0.06-0.077)
		AF	0.025 (0.019-0.032)	0.068 (0.06-0.077)	0.116 (0.109-0.127)
	NP	PF	0.349 (0.337-0.363)	0.111 (0.102-0.12)	0.035 (0.03-0.04)
		CF+MF	0.111 (0.102-0.12)	0.407 (0.367-0.446)	0.139 (0.128-0.151)
		AF	0.035 (0.03-0.04)	0.139 (0.128-0.151)	0.165 (0.155-0.177)
	MP	PF	0.313 (0.285-0.345)	0.116 (0.106-0.141)	0.028 (0.022-0.037)
		CF+MF	0.116 (0.106-0.141)	0.278 (0.245-0.309)	0.109 (0.101-0.123)
		AF	0.028 (0.022-0.037)	0.109 (0.101-0.123)	0.156 (0.143-0.172)
	NS (allele A)	PF	0.493 (0.449-0.536)	0.104 (0.085-0.133)	0.046 (0.035-0.057)
		CF+MF	0.104 (0.085-0.133)	0.384 (0.319-0.439)	0.183 (0.166-0.208)
		AF	0.046 (0.035-0.057)	0.183 (0.166-0.208)	0.228 (0.206-0.254)
	NS (allele B)	PF	0.27 (0.23-0.324)	0.15 (0.129-0.178)	0.036 (0.024-0.051)
		CF+MF	0.15 (0.129-0.178)	0.339 (0.267-0.438)	0.124 (0.103-0.146)
		AF	0.036 (0.024-0.051)	0.124 (0.103-0.146)	0.195 (0.158-0.229)
	HA (H3)	PF	0.246 (0.213-0.25)	0.088 (0.079-0.099)	0 (0-0)
		CF+MF	0.088 (0.079-0.099)	0.286 (0.262-0.321)	0.074 (0.055-0.085)
		AF	0 (0-0)	0.074 (0.055-0.085)	0.106 (0.104-0.108)
	HA (H4)	PF	0.206 (0.163-0.242)	0.067 (0.054-0.082)	0.017 (0.017-0.018)
		CF+MF	0.067 (0.054-0.082)	0.308 (0.281-0.334)	0.098 (0.089-0.102)

		CF	CF+MF	AF
	AF	0.017 (0.017-0.018)	0.098 (0.089-0.102)	0.345 (0.314-0.363)
NA (N6)	PF	0.208 (0.186-0.239)	0.092 (0.082-0.1)	0.012 (0.01-0.028)
	CF+MF	0.092 (0.082-0.1)	0.33 (0.291-0.371)	0.077 (0.068-0.09)
	AF	0.012 (0.01-0.028)	0.077 (0.068-0.09)	n.a.
NA (N8)	PF	0.66 (0.571-0.692)	0.074 (0.061-0.091)	0.051 (0.051-0.093)
	CF+MF	0.074 (0.061-0.091)	0.293 (0.264-0.338)	0.222 (0.191-0.256)
	AF	0.051 (0.051-0.093)	0.222 (0.191-0.256)	n.a.

ML 3-flyway (*q*)		CF	CF+MF	AF
PB2	CF	28.083 (25.286-31.159)	6.03 (5.53-6.675)	0.23 (0-0.693)
	CF+MF	6.03 (5.53-6.675)	13.853 (12.483-15.763)	7.119 (6.594-7.865)
	AF	0.23 (0-0.693)	7.119 (6.594-7.865)	33.111 (29.32-38.211)
PB1	PF	34.717 (30.605-40.367)	6.694 (6.134-7.473)	0 (0-0)
	CF+MF	6.694 (6.134-7.473)	16.238 (14.398-18.509)	7.044 (6.407-7.717)
	AF	0 (0-0)	7.044 (6.407-7.717)	34.957 (30.429-39.994)
PA (lineage B)	PF	11.204 (9.629-14.25)	3.821 (3.253-4.366)	0 (0-0.413)
	CF+MF	3.821 (3.253-4.366)	18.687 (16.542-21.592)	4.805 (4.138-5.476)
	AF	0 (0-0.413)	4.805 (4.138-5.476)	19.476 (16.82-23.172)
PA (lineage A)	PF	44.124 (35.714-55.584)	4.457 (3.812-5.533)	0.41 (0-0.926)
	CF+MF	4.457 (3.812-5.533)	14.644 (12.294-17.878)	3.093 (2.692-3.734)
	AF	0.41 (0-0.926)	3.093 (2.692-3.734)	23.978 (18.933-28.545)
NP	PF	22.453 (19.437-26.406)	1.912 (1.627-2.225)	0.955 (0.796-1.107)
	CF+MF	1.912 (1.627-2.225)	15.748 (13.581-18.413)	4.127 (3.648-4.716)
	AF	0.955 (0.796-1.107)	4.127 (3.648-4.716)	18.956 (15.556-23.352)
MP	PF	29.455 (21.242-40.147)	5.12 (3.911-6.765)	0.667 (0.281-1.388)
	CF+MF	5.12 (3.911-6.765)	20.432 (15.97-26.726)	6.532 (5.329-8.868)
	AF	0.667 (0.281-1.388)	6.532 (5.329-8.868)	22.854 (18.052-34.2)
NS (allele A)	PF	32.287 (24.646-45.884)	3.874 (2.504-5.669)	0.592 (0-1.527)
	CF+MF	3.874 (2.504-5.669)	38.470 (24.235-66.988)	14.171 (11.249-18.323)
	AF	0.592 (0-1.527)	14.171 (11.249-18.323)	54.714 (35.998-83.729)
NS (allele B)	PF	27.868 (19.667-44.028)	10.456 (7.31-14.673)	0.17 (0-1.693)
	CF+MF	10.456 (7.31-14.673)	34.041 (20.176-59.659)	9.033 (5.995-14.381)
	AF	0.17 (0-1.693)	9.033 (5.995-14.381)	4.653 (0-9.457)

HA (H3)	PF	14.038 (11.764-18.116)	2.665 (2.253-3.345)	0 (0-0)
	CF+MF	2.665 (2.253-3.345)	7.769 (6.595-9.111)	2.327 (1.824-2.793)
	AF	0 (0-0)	2.327 (1.824-2.793)	4.014 (2.55-6.345)
HA (H4)	PF	18.274 (14.039-24.018)	3.473 (2.824-4.565)	0 (0-0)
	CF+MF	3.473 (2.824-4.565)	32.878 (25.066-44.674)	3.142 (2.048-4.096)
	AF	0 (0-0)	3.142 (2.048-4.096)	30.051 (22.135-41.343)
NA (N6)	PF	19.254 (14.8-25.311)	2.858 (2.333-3.652)	0 (0-0)
	CF+MF	2.858 (2.333-3.652)	19.614 (14.913-27.745)	2.776 (2.109-3.425)
	AF	0 (0-0)	2.776 (2.109-3.425)	n.a.
NA (N8)	PF	19.306 (15.576-32.644)	1.557 (1.245-2.098)	0 (0-2.459)
	CF+MF	1.557 (1.245-2.098)	8.703 (7.391-10.492)	8.181 (6.66-12.001)
	AF	0 (0-2.459)	8.181 (6.66-12.001)	n.a.

n.a. The N6 and N8 data sets only had one geographical state in the Atlantic flyway (AF) such that the level of gene flow within this flyway could not be inferred.