The following supplement accompanies the article

Evaluation of four stock discrimination methods to assign individuals from mixed-stock fisheries using genetically validated baseline samples

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Supplement.

Table S1. Summary of sampled cod including capture area (ICES subdivision and rectangle) and period (year/month), sample size (N), total fish length (range and mean ± sd (standard deviation)), proportion of spawning individuals (maturity stage 5 and 6), sex ratio (only females presented) and sample origin with fishing gear information. These samples (n = 519 in total) are a subset of the samples used in Weist et al. (2019).

Subdivision	Rectangle	Year/month(s)	N	Length range [cm]	Mean length ± sd [cm]	Spawning fish [%]	Female fish [%]	Sample origin (fishing gear)
22	37G0	2016/03	12	31-79	65.08 ± 14.51	100	25	Survey (bottom trawl)
	37G1	2016/02	26	40-77	59.04 ± 9.65	100	54	Commercial (gill net)
	37G1	2016/02+03	18	34-72	51.06 ± 11.89	100	39	Survey (bottom trawl)
	37G1	2016/07	1	44	44.00 ± 0	100	100	Commercial (bottom trawl)
	38G0	2016/03	1	65	65.00 ± 0	100	100	Survey (bottom trawl)
	38G1	2016/03	4	26-68	41.75 ± 18.95	100	50	Survey (bottom trawl)
23	40G2	2016/03	58	29-55	38.02 ± 4.83	22	28	Recreational (fishing rod)
24	37G3	2015/10	53	43-50	46.45 ± 2.00	0	57	Commercial (gill net)
	37G3	2016/05	55	42-50	47.07 ± 2.10	0	69	Commercial (gill net)
	37G4	2016/06	23	37-67	44.87 ± 6.84	9	57	Commercial (gill net)
	38G2	2016/04	57	49-58	53.47 ± 2.67	5	74	Commercial (gill net)
	38G3	2015/12	54	38-52	44.11 ± 4.06	0	48	Commercial (bottom trawl)
	38G3	2016/05	60	38-45	40.50 ± 1.80	17	73	Commercial (bottom trawl)
	38G4	2015/09	57	38-56	41.67 ± 2.61	0	75	Commercial (bottom trawl)
25	38G5	2016/02	11	30-39	34.45 ± 2.54	100	9	Commercial (gill net)
	38G5	2016/03	10	36-46	39.50 ± 3.89	100	70	Commercial (gill net)
	39G5	2016/05	10	34-49	40.30 ± 4.97	100	70	Commercial (gill net)
	39G6	2016/06	9	32-50	42.22 ± 5.47	100	22	Survey (bottom trawl)

Table S2. Summary of cod otoliths used for stable isotope analyses showing capture area (ICES subdivision and rectangle) and period (year/month), sample size (N), total fish length (range and mean ± sd (standard deviation)), proportion of spawning individuals (maturity stage 5 and 6), sex ratio (only females presented) and genetic affiliation based on single nucleotide polymorphism genotyping (WBC = western Baltic cod, EBC = eastern Baltic cod). These samples (n = 50 in total) are a subset of the samples used in Weist et al. (2019).

Subdivision	Rectangle	Year/month(s)	N	Length range [cm]	Mean length ± sd [cm]	Spawning fish [%]	Female fish [%]	Genetic affiliation
22	37G1	2016/02	7	39-46	41.86 ± 2.54	100	29	WBC
	37G0	2016/03	3	42-71	61.33 ± 16.74	100	0	WBC
23	40G2	2016/03	10	35-40	37.50 ± 2.64	40	40	WBC
24	38G2	2016/04	6	49-58	51.00 ± 3.63	0	17	50% WBC, 50% EBC
	38G3	2016/05	2	40	40.00 ± 0.00	0	50	50% WBC, 50% EBC
	38G4	2015/09	8	40-43	40.5 ± 1.07	0	50	50% WBC, 50% EBC
25	38G5	2016/03	4	36-46	39.25 ± 4.57	100	25	EBC
	39G5	2016/05	5	35-43	40.60 ± 3.36	100	80	EBC
	39G6	2016/06	5	39-42	40.60 ± 1.34	100	0	EBC

Table S3. Stock-specific and overall classification success (Mean) of genetically validated otolith samples based on different combinations of discrimination methods, including only samples from the mixing area (SD 24) and from all capture areas (SD 22, 23, 24 and 25) using linear discriminant analysis. Corresponding sample sizes (N) are given in the white columns. WBC = western Baltic cod, EBC = eastern Baltic cod, TZ = translucent zone

	SD 24					SD 22-25				
	WBC (%)	N	EBC (%)	N	**Mean (%)**	WBC (%)	N	EBC (%)	N	**Mean (%)**
All methods combined[1]	42.9	7	66.7	6	**54.8**	52.4	21	63.6	11	**58.0**
Otolith shape and $\delta^{18}O$ analyses	57.1	7	50.0	8	**53.6**	73.1	26	55.0	20	**64.1**
Analyses of $\delta^{18}O$ and $\delta^{13}C$	71.4	7	100	8	**85.7**	81.5	27	90.5	21	**86.0**
All methods without stable isotope analyses	80.9	131	87.1	155	**84.0**	83.1	231	85.6	167	**84.4**
Otolith shape analysis and diameter of 1st TZ	77.2	136	80.8	156	**79.1**	82.8	238	80.5	169	**81.7**

[1]Otolith shape analysis, analyses of $\delta^{18}O$ and $\delta^{13}C$, otolith readability, diameter of 1st TZ and 2nd TZ

SUPPLEMENTARY LITERATURE CITED

Weist P, Schade FM, Damerau M, Barth JMI, Dierking J, André C, Petereit C, Reusch T, Jentoft S, Hanel R, Krumme U (2019) Assessing SNP-markers to study population mixing and ecological adaptation in Baltic cod. PLOS ONE 14:e0218127

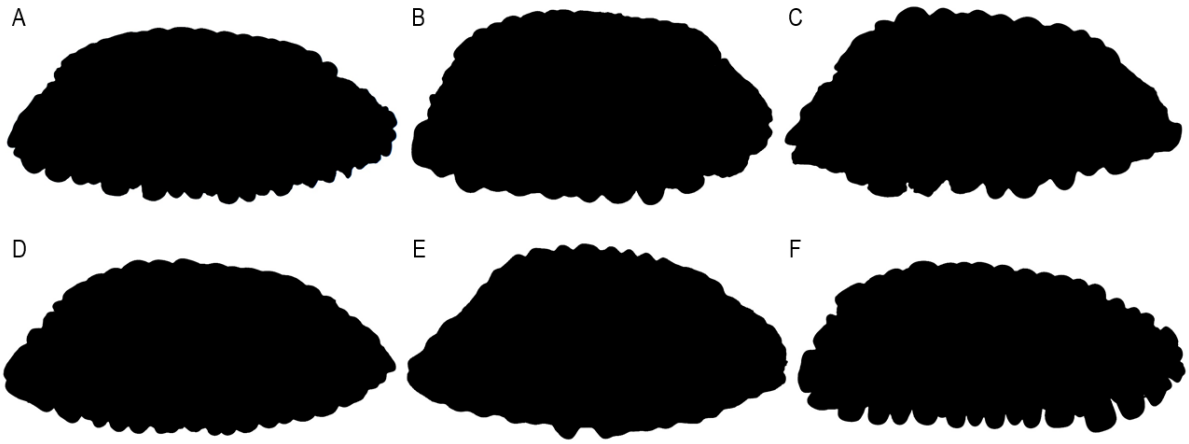

Fig. S1. Images of otoliths from genetically validated western Baltic cod (A-C) and eastern Baltic cod (D-F) used for shape analysis.

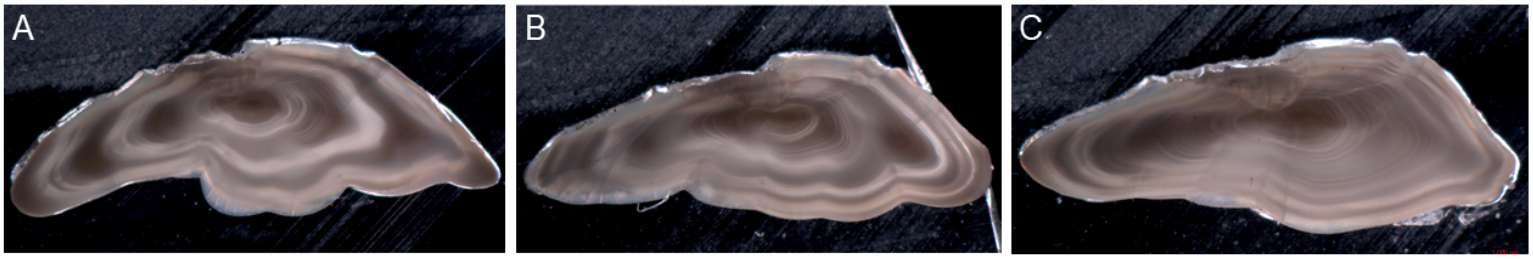

Fig. S2. Examples for otolith readability categories ”readable” (A), “uncertain” (B) and “unreadable” (C) using sliced otoliths of Baltic cod from the mixing area SD 24.

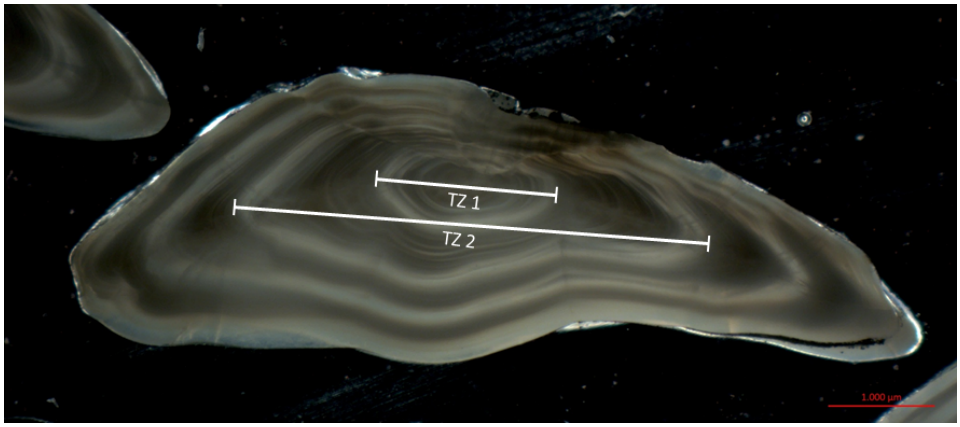

Fig. S3. Diameter measurements of the first two translucent zone (TZ 1 and TZ 2) of a sliced Baltic cod otolith.

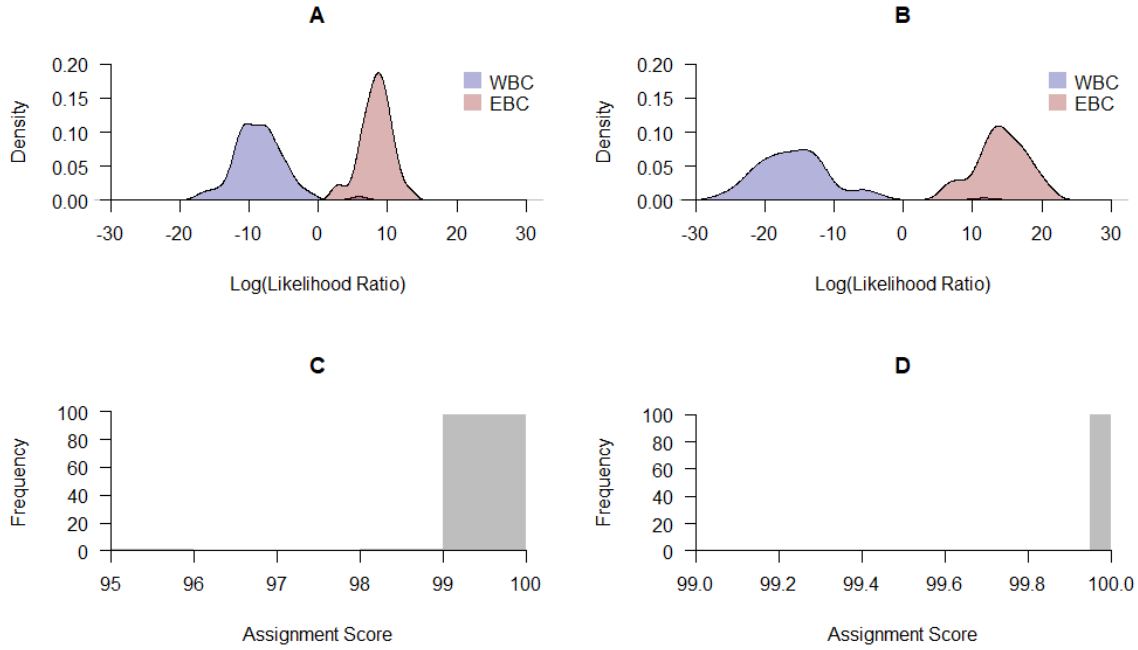

Fig. S4. Distributions of Log(Likelihood ratios) and assignment scores for reference samples from SD 22 (WBC = western Baltic cod) and SD 25 (EBC = eastern Baltic cod) based on the minimum SNP-panel (20 SNPs, A, C) and the full SNP-panel (38 SNPs, B, D).