Supplementary Table ST5. Event counts and optimal solution costs across different parameter values for DTL-RANGER analysis of the original (Bayesian Inference consensus) and amalgamated (ALE) tree topologies. The shown parameter combinations are limited to transfer costs between 5 and 20. DTL-RANGER solutions could not be obtained for the cost combination of <D=4, T=5, L=3> (indicated by N/A values).

Costs			Event counts (average; 1000 random optima)								Optimal reconciliation cost	
D	T	L	Duplications		Transfers		Losses		Σ (all)			
			original	ALE	original	ALE	original	ALE	original	ALE	original	ALE
4	**5**	**1**	11.63	17.79	189.03	153.74	149.32	217.13	349.98	388.66	1141	1057
4	**6**	**1**	20.65	25.66	168.24	135.65	224.99	285.49	413.88	446.79	1317	1202
4	**7**	**1**	45.47	47.19	133.31	87.90	353.97	511.90	532.75	647.00	1469	1316
4	**8**	**1**	73.05	62.56	81.60	61.62	630.03	650.79	784.68	774.97	1575	1394
4	**9**	**1**	84.67	77.01	66.33	40.99	712.34	764.04	863.34	882.04	1648	1441
4	**10**	**1**	92.98	85.06	56.55	28.42	774.59	848.53	924.12	962.01	1712	1473
4	**11**	**1**	103.29	88.00	43.71	25.00	864.02	871.00	1011.02	984.00	1758	1498
4	**12**	**1**	119.07	88.50	24.93	24.50	1016.58	875.00	1160.58	988.00	1792	1523
4	**13**	**1**	126.84	96.27	17.47	15.73	1077.52	954.43	1221.83	1066.43	1812	1544
4	**14**	**1**	131.53	97.47	13.98	14.53	1105.18	965.69	1250.69	1077.69	1827	1559
4	**15**	**1**	133.80	99.80	12.60	13.10	1115.81	977.29	1262.21	1090.19	1840	1573
4	**16**	**1**	140.50	104.51	8.51	10.49	1151.94	998.12	1300.94	1113.12	1850	1584
4	**17**	**1**	144.00	106.62	6.00	9.04	1179.00	1013.91	1329.00	1129.57	1857	1594
4	**18**	**1**	144.00	110.51	6.00	6.49	1179.00	1042.11	1329.00	1159.11	1863	1601
4	**19**	**1**	144.96	111.00	5.52	6.00	1184.29	1049.00	1334.77	1166.00	1869	1607
4	**20**	**1**	146.00	111.00	5.00	6.00	1190.00	1049.00	1341.00	1166.00	1874	1613
4	**5**	**2**	8.00	6.40	218.00	204.14	46.00	54.35	272.00	264.89	1214	1155
4	**6**	**2**	8.57	7.02	217.01	194.55	47.83	78.31	273.41	279.88	1432	1352
4	**7**	**2**	11.54	12.00	212.46	187.00	56.32	93.00	280.32	292.00	1646	1543
4	**8**	**2**	20.92	19.86	180.31	164.37	161.93	164.79	363.16	349.02	1850	1724
4	**9**	**2**	29.01	26.00	171.67	145.00	181.48	233.00	382.15	404.00	2024	1875
4	**10**	**2**	35.09	32.99	163.60	136.12	207.82	263.42	406.51	432.53	2192	2020
4	**11**	**2**	47.24	44.668	138.98	112.664	312.14	361.012	498.35	518.34	2342	2140
4	**12**	**2**	56.86	50.368	123.37	102.988	383.05	405.336	563.28	558.69	2474	2248

4	**13**	**2**	67.03	62.550	103.94	74.994	483.32	555.439	654.29	692.98	2586	2336
4	**14**	**2**	79.91	69.212	79.65	58.666	622.61	650.914	782.17	778.79	2680	2400
4	**15**	**2**	86.55	78.000	68.89	40.000	686.20	769.000	841.65	887.00	2752	2450
4	**16**	**2**	91.19	79.317	61.99	38.539	730.69	778.054	883.87	895.91	2818	2490
4	**17**	**2**	95.64	86.000	56.36	28.000	767.16	849.000	919.16	963.00	2875	2518
4	**18**	**2**	104.23	88.000	45.85	25.000	842.85	871.000	992.94	984.00	2928	2544
4	**19**	**2**	109.00	88.000	40.00	25.000	886.00	871.000	1035.00	984.00	2968	2569
4	**20**	**2**	122.11	88.516	24.42	24.484	1013.61	875.128	1160.14	988.13	3004	2594
4	**5**	**3**	8.00	N/A	223.00	N/A	36.00	N/A	267.00	0.00	1255	N/A
4	**6**	**3**	8.00	7.000	221.79	212.542	38.42	35.916	268.21	255.46	1478	1411
4	**7**	**3**	8.58	10.976	217.42	202.914	46.58	50.566	272.58	264.46	1696	1616
4	**8**	**3**	10.68	19.377	215.66	193.377	48.00	62.492	274.34	275.25	1912	1812
4	**9**	**3**	14.00	19.000	211.96	192.199	54.14	66.403	280.09	277.60	2126	2005
4	**10**	**3**	14.67	18.810	210.33	184.772	58.35	90.680	283.35	294.26	2337	2195
4	**11**	**3**	29.00	21.348	175.00	177.304	168.00	113.088	372.00	311.74	2545	2375
4	**12**	**3**	31.00	25.000	171.85	160.180	177.62	172.280	380.46	357.46	2719	2539
4	**13**	**3**	34.22	28.977	166.78	143.023	194.67	236.931	395.67	408.93	2889	2686
4	**14**	**3**	39.00	35.550	160.00	133.900	218.00	269.400	417.00	438.85	3050	2825
4	**15**	**3**	42.00	43.733	152.00	116.784	253.00	341.436	447.00	501.95	3207	2951
4	**16**	**3**	53.18	46.802	132.82	109.646	335.70	374.152	521.70	530.60	3345	3064
4	**17**	**3**	59.85	53.272	121.29	101.364	389.91	409.908	571.04	564.54	3471	3166
4	**18**	**3**	63.82	60.467	113.28	81.555	431.23	517.714	608.33	659.74	3588	3263
4	**19**	**3**	70.16	70.000	99.74	66.000	505.46	600.000	675.35	736.00	3692	3334
4	**20**	**3**	84.00	71.018	78.00	61.964	627.00	625.216	789.00	758.20	3777	3399

Supplementary Table ST6. Fraction of event labels (speciation, transfer donor, duplication) shared between DTL-RANGER and ALE for both original and amalgamated (ALE) tree topology. For DTL-RANGER type of event was determined by frequency within sampled reconciliations. Solutions could not be obtained for the cost combination of <D=4, T=5, L=3> (indicated by N/A values). The shown parameter combinations are limited to transfer costs between 5 and 20. For the original tree (Bayesian consensus) only the 352 non-rearranged bipartitions (shared between amalgamated and original trees) were taken into account.

Costs			Frequency of identical predictions between DTL-RANGER and ALE							
D	T	L	Duplication		Speciation		Transfer		Σ (all)	
			original	ALE	original	ALE	original	ALE	original	ALE
4	**5**	**1**	1.000	1.000	0.842	0.937	0.173	0.160	0.582	0.792
4	**6**	**1**	1.000	1.000	0.833	0.941	0.198	0.182	0.622	0.817
4	**7**	**1**	0.806	1.000	0.851	0.958	0.238	0.284	0.670	0.888
4	**8**	**1**	0.803	0.969	0.897	0.971	0.414	0.400	0.801	0.930
4	**9**	**1**	0.817	0.974	0.932	0.987	0.489	0.600	0.849	0.967
4	**10**	**1**	0.805	0.976	0.940	0.993	0.575	0.857	0.869	0.987
4	**11**	**1**	0.767	0.977	0.940	0.997	0.645	0.960	0.872	0.994
4	**12**	**1**	0.760	0.977	0.945	0.997	0.789	0.960	0.886	0.994
4	**13**	**1**	0.730	0.897	0.928	0.987	0.733	1.000	0.864	0.977
4	**14**	**1**	0.724	0.897	0.932	0.987	0.900	1.000	0.869	0.977
4	**15**	**1**	0.724	0.870	0.932	0.985	0.900	1.000	0.869	0.971
4	**16**	**1**	0.694	0.829	0.932	0.983	1.000	1.000	0.858	0.964
4	**17**	**1**	0.675	0.829	0.919	0.983	1.000	1.000	0.841	0.964
4	**18**	**1**	0.675	0.784	0.919	0.977	1.000	1.000	0.841	0.952
4	**19**	**1**	0.675	0.784	0.919	0.977	1.000	1.000	0.841	0.952
4	**20**	**1**	0.664	0.784	0.927	0.977	1.000	1.000	0.841	0.952
4	**5**	**2**	0.833	1.000	0.868	0.953	0.146	0.123	0.531	0.748
4	**6**	**2**	0.857	1.000	0.878	0.947	0.146	0.128	0.537	0.754
4	**7**	**2**	0.900	1.000	0.884	0.949	0.149	0.134	0.548	0.765
4	**8**	**2**	0.938	1.000	0.847	0.945	0.179	0.151	0.597	0.787
4	**9**	**2**	0.846	1.000	0.855	0.946	0.190	0.172	0.616	0.812
4	**10**	**2**	0.774	1.000	0.870	0.950	0.198	0.184	0.631	0.825

4	**11**	**2**	0.732	1.000	0.863	0.957	0.226	0.223	0.656	0.859
4	**12**	**2**	0.739	1.000	0.867	0.960	0.250	0.238	0.682	0.870
4	**13**	**2**	0.772	0.969	0.891	0.977	0.320	0.333	0.750	0.920
4	**14**	**2**	0.812	0.971	0.934	0.980	0.429	0.414	0.830	0.939
4	**15**	**2**	0.803	0.974	0.926	0.987	0.460	0.600	0.835	0.967
4	**16**	**2**	0.795	0.974	0.931	0.987	0.489	0.600	0.844	0.967
4	**17**	**2**	0.782	0.977	0.936	0.996	0.537	0.857	0.855	0.989
4	**18**	**2**	0.770	0.977	0.949	0.997	0.677	0.960	0.881	0.994
4	**19**	**2**	0.756	0.977	0.948	0.997	0.690	0.960	0.878	0.994
4	**20**	**2**	0.765	0.977	0.958	0.997	0.889	0.960	0.901	0.994
4	**5**	**3**	0.833	N/A	0.875	N/A	0.141	N/A	0.520	N/A
4	**6**	**3**	0.833	1.000	0.875	0.957	0.141	0.117	0.520	0.739
4	**7**	**3**	0.833	1.000	0.873	0.962	0.145	0.123	0.531	0.756
4	**8**	**3**	0.875	0.947	0.878	0.962	0.147	0.130	0.540	0.767
4	**9**	**3**	0.917	0.947	0.889	0.962	0.150	0.130	0.554	0.767
4	**10**	**3**	0.917	1.000	0.889	0.955	0.150	0.137	0.554	0.775
4	**11**	**3**	0.846	0.952	0.858	0.957	0.186	0.140	0.611	0.781
4	**12**	**3**	0.786	1.000	0.852	0.951	0.188	0.155	0.605	0.798
4	**13**	**3**	0.767	1.000	0.859	0.948	0.194	0.174	0.616	0.815
4	**14**	**3**	0.765	1.000	0.874	0.951	0.202	0.185	0.636	0.828
4	**15**	**3**	0.722	1.000	0.867	0.955	0.212	0.214	0.642	0.852
4	**16**	**3**	0.732	1.000	0.870	0.957	0.231	0.223	0.665	0.859
4	**17**	**3**	0.755	1.000	0.876	0.964	0.258	0.245	0.696	0.878
4	**18**	**3**	0.750	0.983	0.873	0.969	0.273	0.298	0.705	0.902
4	**19**	**3**	0.783	0.957	0.900	0.978	0.333	0.364	0.764	0.927
4	**20**	**3**	0.792	0.958	0.934	0.981	0.426	0.400	0.827	0.937

Supplementary Table ST7. Fraction of event mappings (species tree nodes) shared between DTL-RANGER and ALE for both original and amalgamated (ALE) trees. Measure is tentative as ALE and DTL-RANGER model transfer process differently (with ALE explicitly modelling two-step transfer through extinct intermediate lineages). Mapping was taken to be in accord, if (all of) the most frequent predictions by DTL-RANGER were indicated in the ALE output for given node. Solutions could not be obtained for the cost combination of <D=4, T=5, L=3> (indicated by N/A values). The shown parameter combinations are limited to transfer costs between 5 and 20. For the original tree (Bayesian consensus) only the 352 non-rearranged bipartitions (shared between amalgamated and original trees) were taken into account.

Costs			Frequency of identical predictions between DTL-RANGER and ALE							
D	T	L	Duplication		Speciation		Transfer		Σ (all)	
			original	ALE	original	ALE	original	ALE	original	ALE
4	**5**	**1**	0.700	0.824	0.828	0.948	0.086	0.122	0.531	0.789
4	**6**	**1**	0.533	0.792	0.819	0.950	0.099	0.153	0.560	0.813
4	**7**	**1**	0.778	0.872	0.851	0.967	0.158	0.227	0.645	0.882
4	**8**	**1**	0.869	0.938	0.906	0.977	0.310	0.400	0.801	0.932
4	**9**	**1**	0.887	0.949	0.919	0.987	0.383	0.500	0.841	0.960
4	**10**	**1**	0.896	0.976	0.932	0.993	0.525	0.821	0.878	0.985
4	**11**	**1**	0.919	0.989	0.936	0.996	0.548	0.880	0.898	0.992
4	**12**	**1**	0.938	0.989	0.937	0.996	0.737	0.920	0.926	0.993
4	**13**	**1**	0.930	0.938	0.920	0.983	0.667	0.867	0.912	0.976
4	**14**	**1**	0.933	0.938	0.920	0.983	0.700	0.867	0.918	0.976
4	**15**	**1**	0.933	0.930	0.920	0.980	0.700	0.846	0.918	0.972
4	**16**	**1**	0.892	0.886	0.923	0.982	1.000	1.000	0.915	0.970
4	**17**	**1**	0.860	0.886	0.911	0.982	1.000	0.900	0.895	0.968
4	**18**	**1**	0.860	0.838	0.911	0.976	1.000	1.000	0.895	0.958
4	**19**	**1**	0.860	0.838	0.911	0.976	1.000	1.000	0.895	0.958
4	**20**	**1**	0.845	0.838	0.918	0.976	1.000	1.000	0.895	0.958
4	**5**	**2**	0.667	0.667	0.830	0.961	0.079	0.083	0.477	0.742
4	**6**	**2**	0.714	0.857	0.834	0.952	0.073	0.092	0.477	0.748
4	**7**	**2**	0.500	0.583	0.834	0.950	0.075	0.080	0.477	0.748
4	**8**	**2**	0.563	0.611	0.827	0.952	0.090	0.114	0.534	0.776

4	**9**	**2**	0.500	0.846	0.835	0.950	0.087	0.124	0.543	0.801
4	**10**	**2**	0.516	0.758	0.860	0.953	0.124	0.140	0.577	0.811
4	**11**	**2**	0.537	0.711	0.878	0.963	0.132	0.179	0.614	0.842
4	**12**	**2**	0.717	0.735	0.876	0.966	0.188	0.200	0.668	0.855
4	**13**	**2**	0.754	0.862	0.886	0.977	0.227	0.278	0.724	0.907
4	**14**	**2**	0.855	0.928	0.921	0.980	0.286	0.345	0.807	0.931
4	**15**	**2**	0.901	0.949	0.918	0.987	0.360	0.500	0.835	0.960
4	**16**	**2**	0.890	0.949	0.927	0.987	0.383	0.500	0.847	0.960
4	**17**	**2**	0.897	0.988	0.927	0.994	0.390	0.821	0.858	0.988
4	**18**	**2**	0.897	0.989	0.940	0.996	0.516	0.920	0.892	0.993
4	**19**	**2**	0.911	0.989	0.944	0.996	0.552	0.920	0.903	0.993
4	**20**	**2**	0.939	0.989	0.945	0.996	0.889	0.920	0.940	0.993
4	**5**	**3**	0.667	N/A	0.835	N/A	0.071	N/A	0.463	N/A
4	**6**	**3**	0.667	0.571	0.841	0.960	0.065	0.070	0.463	0.726
4	**7**	**3**	0.667	0.417	0.834	0.967	0.079	0.074	0.477	0.739
4	**8**	**3**	0.625	0.368	0.829	0.967	0.074	0.078	0.474	0.745
4	**9**	**3**	0.417	0.368	0.833	0.966	0.069	0.062	0.472	0.741
4	**10**	**3**	0.417	0.588	0.844	0.957	0.081	0.093	0.483	0.758
4	**11**	**3**	0.500	0.524	0.832	0.957	0.078	0.084	0.531	0.758
4	**12**	**3**	0.536	0.520	0.832	0.955	0.102	0.112	0.543	0.777
4	**13**	**3**	0.567	0.786	0.838	0.951	0.105	0.125	0.557	0.801
4	**14**	**3**	0.529	0.714	0.859	0.954	0.126	0.133	0.580	0.810
4	**15**	**3**	0.500	0.636	0.867	0.959	0.142	0.162	0.597	0.829
4	**16**	**3**	0.561	0.711	0.884	0.963	0.144	0.188	0.628	0.844
4	**17**	**3**	0.673	0.750	0.881	0.969	0.161	0.206	0.662	0.861
4	**18**	**3**	0.673	0.831	0.873	0.972	0.193	0.274	0.673	0.891
4	**19**	**3**	0.767	0.871	0.891	0.978	0.236	0.318	0.736	0.916
4	**20**	**3**	0.861	0.889	0.925	0.981	0.333	0.367	0.821	0.928