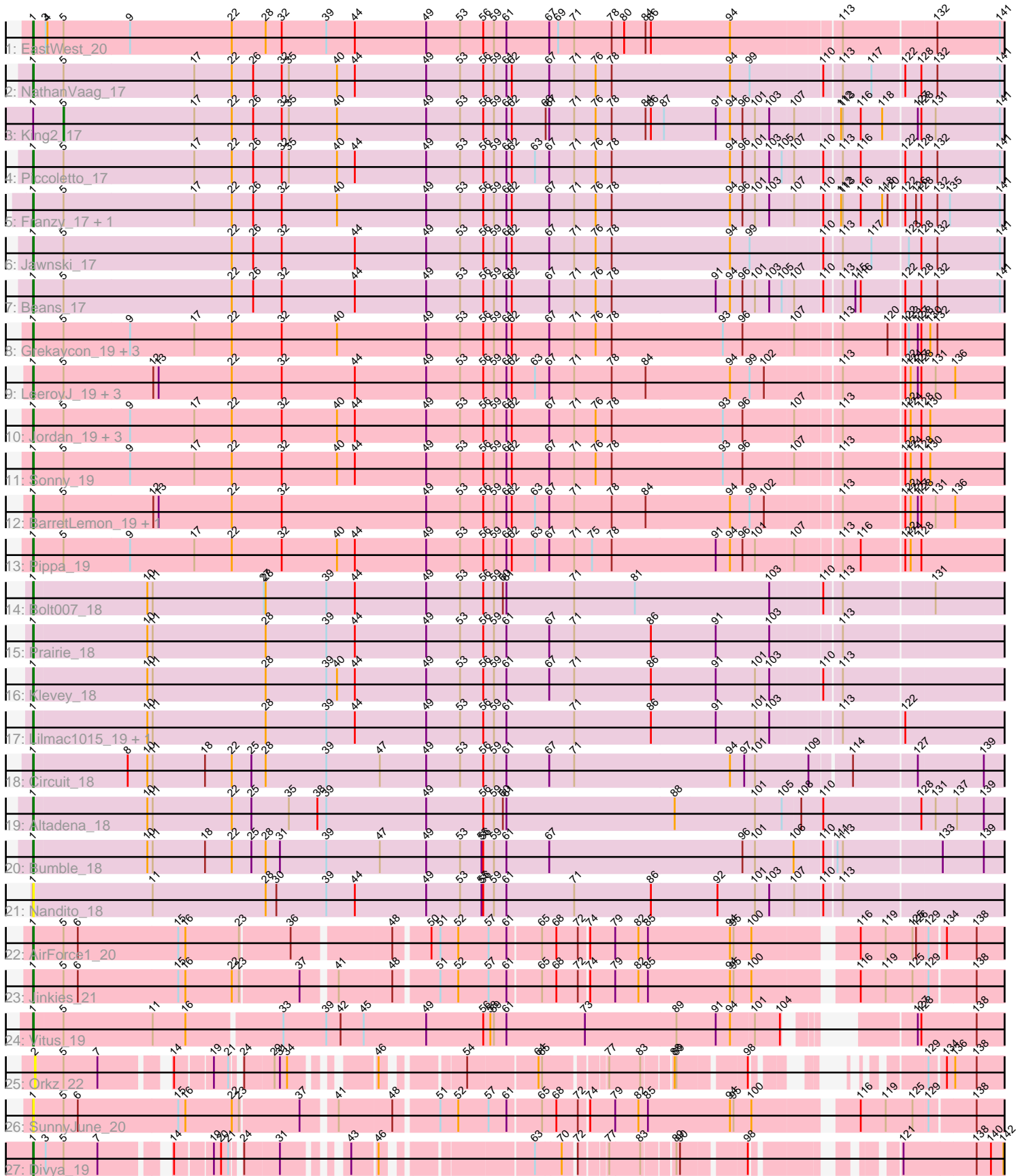


# Zoomed Pham 311800



Note: Tracks are now grouped by subcluster and scaled. Switching in subcluster is indicated by changes in track color. Track scale is now set by default to display the region 30 bp upstream of start 1 to 30 bp downstream of the last possible start. If this default region is judged to be packed too tightly with annotated starts, the track will be further scaled to only show that region of the ORF with annotated starts. This action will be indicated by adding "Zoomed" to the title. For starts, yellow indicates the location of called starts comprised solely of Glimmer/GeneMark auto-annotations, green indicates the location of called starts with at least 1 manual gene annotation.

## Pham 311800 Report

This analysis was run 06/27/26 on database version 652.

Pham number 311800 has 39 members, 5 are drafts.

Phages represented in each track:

- Track 1 : EastWest\_20
- Track 2 : NathanVaag\_17
- Track 3 : King2\_17
- Track 4 : Piccoletto\_17
- Track 5 : Franzy\_17, Brent\_17
- Track 6 : Jawnski\_17
- Track 7 : Beans\_17
- Track 8 : Grekaycon\_19, BossLady\_19, Martha\_19, TaeYoung\_19
- Track 9 : LeeroyJ\_19, GravityBall\_19, Timinator\_19, StevieBAY\_19
- Track 10 : Jordan\_19, Shade\_19, Zartrosa\_19, JKerns\_19
- Track 11 : Sonny\_19
- Track 12 : BarretLemon\_19, BigDome\_19
- Track 13 : Pippa\_19
- Track 14 : Bolt007\_18
- Track 15 : Prairie\_18
- Track 16 : Klevey\_18
- Track 17 : Lilmac1015\_19, CalWood4100\_19
- Track 18 : Circuit\_18
- Track 19 : Altadena\_18
- Track 20 : Bumble\_18
- Track 21 : Nandito\_18
- Track 22 : AirForce1\_20
- Track 23 : Jinkies\_21
- Track 24 : Vitus\_19
- Track 25 : Orkz\_22
- Track 26 : SunnyJune\_20
- Track 27 : Divya\_19

### ***Summary of Final Annotations (See graph section above for start numbers):***

The start number called the most often in the published annotations is 1, it was called in 33 of the 34 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- AirForce1\_20, Altadena\_18, BarretLemon\_19, Beans\_17, BigDome\_19, Bolt007\_18, BossLady\_19, Brent\_17, Bumble\_18, CalWood4100\_19, Circuit\_18, Divya\_19, EastWest\_20, Franzy\_17, GravityBall\_19, Grekaycon\_19, JKerns\_19, Jawnski\_17, Jinkies\_21, Jordan\_19, Klevey\_18, LeeroyJ\_19, Lilmac1015\_19, Martha\_19, Nandito\_18, NathanVaag\_17, Piccoletto\_17, Pippa\_19, Prairie\_18, Shade\_19, Sonny\_19, StevieBAY\_19, SunnyJune\_20, TaeYoung\_19, Timinator\_19, Vitus\_19, Zartrosa\_19,

Genes that have the "Most Annotated" start but do not call it:

- King2\_17,

Genes that do not have the "Most Annotated" start:

- Orkz\_22,

### Summary by start number:

Start 1:

- Found in 38 of 39 ( 97.4% ) of genes in pham
- Manual Annotations of this start: 33 of 34
- Called 97.4% of time when present
- Phage (with cluster) where this start called: AirForce1\_20 (FL), Altadena\_18 (FH), BarretLemon\_19 (AO2), Beans\_17 (AO1), BigDome\_19 (AO2), Bolt007\_18 (FH), BossLady\_19 (AO2), Brent\_17 (AO1), Bumble\_18 (FH), CalWood4100\_19 (FH), Circuit\_18 (FH), Divya\_19 (FL), EastWest\_20 (AO), Franzy\_17 (AO1), GravityBall\_19 (AO2), Grekaycon\_19 (AO2), JKerns\_19 (AO2), Jawnski\_17 (AO1), Jinkies\_21 (FL), Jordan\_19 (AO2), Klevey\_18 (FH), LeeroyJ\_19 (AO2), Lilmac1015\_19 (FH), Martha\_19 (AO2), Nandito\_18 (FH), NathanVaag\_17 (AO1), Piccoletto\_17 (AO1), Pippa\_19 (AO2), Prairie\_18 (FH), Shade\_19 (AO2), Sonny\_19 (AO2), StevieBAY\_19 (AO2), SunnyJune\_20 (FL), TaeYoung\_19 (AO2), Timinator\_19 (AO2), Vitus\_19 (FL), Zartrosa\_19 (AO2),

Start 2:

- Found in 1 of 39 ( 2.6% ) of genes in pham
- No Manual Annotations of this start.
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Orkz\_22 (FL),

Start 5:

- Found in 30 of 39 ( 76.9% ) of genes in pham
- Manual Annotations of this start: 1 of 34
- Called 3.3% of time when present
- Phage (with cluster) where this start called: King2\_17 (AO1),

### Summary by clusters:

There are 5 clusters represented in this pham: FH, AO, FL, AO2, AO1,

Info for manual annotations of cluster AO:

- Start number 1 was manually annotated 1 time for cluster AO.

Info for manual annotations of cluster AO1:

- Start number 1 was manually annotated 6 times for cluster AO1.
- Start number 5 was manually annotated 1 time for cluster AO1.

Info for manual annotations of cluster AO2:

- Start number 1 was manually annotated 15 times for cluster AO2.

Info for manual annotations of cluster FH:

- Start number 1 was manually annotated 7 times for cluster FH.

Info for manual annotations of cluster FL:

- Start number 1 was manually annotated 4 times for cluster FL.

### **Gene Information:**

Gene: AirForce1\_20 Start: 13442, Stop: 15898, Start Num: 1

Candidate Starts for AirForce1\_20:

(Start: 1 @13442 has 33 MA's), (Start: 5 @13490 has 1 MA's), (6, 13514), (15, 13682), (16, 13694), (23, 13784), (36, 13865), (48, 14018), (50, 14072), (51, 14087), (52, 14117), (57, 14168), (61, 14198), (65, 14252), (68, 14276), (72, 14312), (74, 14327), (79, 14369), (82, 14408), (85, 14423), (94, 14561), (95, 14567), (100, 14597), (116, 14750), (119, 14792), (125, 14837), (126, 14843), (129, 14861), (134, 14885), (138, 14930), (175, 15092), (203, 15269), (214, 15389), (232, 15626), (233, 15665), (237, 15788),

Gene: Altadena\_18 Start: 13127, Stop: 15736, Start Num: 1

Candidate Starts for Altadena\_18:

(Start: 1 @13127 has 33 MA's), (10, 13313), (11, 13322), (22, 13454), (25, 13487), (35, 13550), (38, 13598), (39, 13613), (49, 13781), (56, 13877), (59, 13895), (60, 13910), (61, 13916), (88, 14198), (101, 14330), (105, 14375), (108, 14405), (110, 14441), (128, 14600), (131, 14621), (137, 14657), (139, 14702), (146, 14753), (151, 14786), (153, 14792), (156, 14807), (159, 14825), (167, 14861), (182, 14963), (183, 14969), (193, 15035), (194, 15038), (198, 15065), (199, 15071), (210, 15158), (214, 15233), (216, 15284), (222, 15338), (225, 15371), (230, 15455), (233, 15521),

Gene: BarretLemon\_19 Start: 13749, Stop: 16382, Start Num: 1

Candidate Starts for BarretLemon\_19:

(Start: 1 @13749 has 33 MA's), (Start: 5 @13797 has 1 MA's), (12, 13947), (13, 13956), (22, 14079), (32, 14163), (49, 14406), (53, 14463), (56, 14502), (59, 14520), (61, 14541), (62, 14550), (63, 14589), (67, 14613), (71, 14655), (78, 14718), (84, 14775), (94, 14916), (99, 14949), (102, 14973), (113, 15090), (122, 15189), (124, 15198), (127, 15210), (128, 15216), (131, 15237), (136, 15270), (144, 15363), (149, 15390), (151, 15402), (154, 15414), (157, 15432), (158, 15435), (160, 15444), (168, 15480), (172, 15498), (173, 15501), (174, 15510), (177, 15534), (178, 15546), (179, 15564), (180, 15567), (182, 15579), (187, 15615), (194, 15654), (199, 15687), (202, 15708), (206, 15726), (207, 15738), (208, 15747), (210, 15774), (215, 15858), (217, 15903), (222, 15954), (228, 16035), (231, 16098), (232, 16104), (233, 16143), (234, 16248), (237, 16272), (243, 16320), (245, 16341),

Gene: Beans\_17 Start: 13458, Stop: 16085, Start Num: 1

Candidate Starts for Beans\_17:

(Start: 1 @13458 has 33 MA's), (Start: 5 @13506 has 1 MA's), (22, 13788), (26, 13824), (32, 13872), (44, 13995), (49, 14115), (53, 14172), (56, 14211), (59, 14229), (61, 14250), (62, 14259), (67, 14322), (71, 14364), (76, 14400), (78, 14427), (91, 14601), (94, 14625), (96, 14646), (101, 14667), (103, 14691), (105, 14712), (107, 14730), (110, 14772), (113, 14799), (115, 14820), (116, 14829), (122, 14898), (128, 14925), (132, 14949), (141, 15054), (146, 15078), (148, 15096), (149, 15099), (151, 15111), (157, 15141), (160, 15153), (165, 15177), (171, 15201), (172, 15207), (173, 15210), (174, 15219), (178, 15255), (179, 15273), (182, 15288), (185, 15309), (190, 15339), (194, 15363), (199,

15396), (202, 15417), (203, 15426), (208, 15456), (210, 15483), (213, 15525), (219, 15633), (220, 15645), (222, 15663), (228, 15741), (230, 15783), (231, 15804), (232, 15810), (233, 15849), (235, 15957), (237, 15978), (246, 16053),

Gene: BigDome\_19 Start: 13737, Stop: 16370, Start Num: 1

Candidate Starts for BigDome\_19:

(Start: 1 @13737 has 33 MA's), (Start: 5 @13785 has 1 MA's), (12, 13935), (13, 13944), (22, 14067), (32, 14151), (49, 14394), (53, 14451), (56, 14490), (59, 14508), (61, 14529), (62, 14538), (63, 14577), (67, 14601), (71, 14643), (78, 14706), (84, 14763), (94, 14904), (99, 14937), (102, 14961), (113, 15078), (122, 15177), (124, 15186), (127, 15198), (128, 15204), (131, 15225), (136, 15258), (144, 15351), (149, 15378), (151, 15390), (154, 15402), (157, 15420), (158, 15423), (160, 15432), (168, 15468), (172, 15486), (173, 15489), (174, 15498), (177, 15522), (178, 15534), (179, 15552), (180, 15555), (182, 15567), (187, 15603), (194, 15642), (199, 15675), (202, 15696), (206, 15714), (207, 15726), (208, 15735), (210, 15762), (215, 15846), (217, 15891), (222, 15942), (228, 16023), (231, 16086), (232, 16092), (233, 16131), (234, 16236), (237, 16260), (243, 16308), (245, 16329),

Gene: Bolt007\_18 Start: 12985, Stop: 15567, Start Num: 1

Candidate Starts for Bolt007\_18:

(Start: 1 @12985 has 33 MA's), (10, 13171), (11, 13180), (27, 13366), (28, 13369), (39, 13471), (44, 13519), (49, 13639), (53, 13696), (56, 13735), (59, 13753), (60, 13768), (61, 13774), (71, 13888), (81, 13990), (103, 14215), (110, 14296), (113, 14323), (131, 14470), (146, 14602), (147, 14614), (151, 14635), (159, 14674), (170, 14722), (181, 14809), (184, 14827), (186, 14845), (189, 14854), (199, 14920), (201, 14938), (202, 14941), (210, 15007), (230, 15277), (233, 15343), (236, 15451), (240, 15472),

Gene: BossLady\_19 Start: 13763, Stop: 16393, Start Num: 1

Candidate Starts for BossLady\_19:

(Start: 1 @13763 has 33 MA's), (Start: 5 @13811 has 1 MA's), (9, 13922), (17, 14030), (22, 14093), (32, 14177), (40, 14270), (49, 14420), (53, 14477), (56, 14516), (59, 14534), (61, 14555), (62, 14564), (67, 14627), (71, 14669), (76, 14705), (78, 14732), (93, 14918), (96, 14951), (107, 15035), (113, 15104), (120, 15179), (122, 15203), (123, 15209), (127, 15224), (128, 15230), (130, 15242), (132, 15254), (147, 15395), (149, 15404), (151, 15416), (165, 15482), (173, 15515), (174, 15524), (177, 15548), (178, 15560), (182, 15593), (194, 15668), (199, 15701), (202, 15722), (203, 15731), (210, 15788), (213, 15830), (215, 15872), (222, 15968), (228, 16049), (230, 16091), (231, 16112), (232, 16118), (233, 16157), (234, 16259), (237, 16283), (243, 16331), (245, 16352),

Gene: Brent\_17 Start: 13434, Stop: 16064, Start Num: 1

Candidate Starts for Brent\_17:

(Start: 1 @13434 has 33 MA's), (Start: 5 @13482 has 1 MA's), (17, 13701), (22, 13764), (26, 13800), (32, 13848), (40, 13941), (49, 14091), (53, 14148), (56, 14187), (59, 14205), (61, 14226), (62, 14235), (67, 14298), (71, 14340), (76, 14376), (78, 14403), (94, 14601), (96, 14622), (101, 14643), (103, 14667), (107, 14706), (110, 14748), (112, 14772), (113, 14775), (116, 14805), (118, 14841), (120, 14850), (122, 14874), (126, 14892), (128, 14901), (132, 14925), (135, 14946), (141, 15030), (147, 15066), (148, 15072), (149, 15075), (151, 15087), (156, 15108), (157, 15117), (165, 15153), (173, 15186), (174, 15195), (177, 15219), (178, 15231), (179, 15249), (182, 15264), (187, 15300), (188, 15303), (194, 15339), (196, 15354), (199, 15372), (202, 15393), (203, 15402), (208, 15432), (209, 15456), (210, 15459), (222, 15639), (228, 15720), (230, 15762), (231, 15783), (232, 15789), (233, 15828), (235, 15936), (237, 15957), (246, 16032),

Gene: Bumble\_18 Start: 13132, Stop: 15741, Start Num: 1

Candidate Starts for Bumble\_18:

(Start: 1 @13132 has 33 MA's), (10, 13318), (11, 13327), (18, 13414), (22, 13459), (25, 13492), (28, 13516), (31, 13540), (39, 13618), (47, 13708), (49, 13786), (53, 13843), (55, 13879), (56, 13882), (59,

13900), (61, 13921), (67, 13993), (96, 14317), (101, 14338), (106, 14401), (110, 14443), (111, 14461), (113, 14470), (133, 14629), (139, 14698), (149, 14770), (151, 14782), (153, 14788), (158, 14815), (159, 14821), (166, 14854), (181, 14956), (182, 14959), (184, 14974), (193, 15031), (194, 15034), (199, 15067), (206, 15106), (210, 15154), (211, 15163), (222, 15334), (233, 15517),

Gene: CalWood4100\_19 Start: 12965, Stop: 15547, Start Num: 1

Candidate Starts for CalWood4100\_19:

(Start: 1 @12965 has 33 MA's), (10, 13151), (11, 13160), (28, 13349), (39, 13451), (44, 13499), (49, 13619), (53, 13676), (56, 13715), (59, 13733), (61, 13754), (71, 13868), (86, 13997), (91, 14105), (101, 14171), (103, 14195), (113, 14303), (122, 14402), (147, 14594), (151, 14615), (159, 14654), (178, 14759), (181, 14789), (199, 14900), (201, 14918), (202, 14921), (205, 14936), (210, 14987), (213, 15029), (233, 15323), (236, 15431), (240, 15452),

Gene: Circuit\_18 Start: 13139, Stop: 15739, Start Num: 1

Candidate Starts for Circuit\_18:

(Start: 1 @13139 has 33 MA's), (8, 13292), (10, 13325), (11, 13334), (18, 13421), (22, 13466), (25, 13499), (28, 13523), (39, 13625), (47, 13715), (49, 13793), (53, 13850), (56, 13889), (59, 13907), (61, 13928), (67, 14000), (71, 14042), (94, 14303), (97, 14327), (101, 14342), (109, 14432), (114, 14492), (127, 14594), (139, 14702), (151, 14786), (153, 14792), (163, 14846), (166, 14858), (175, 14897), (181, 14960), (182, 14963), (189, 15005), (194, 15038), (199, 15071), (204, 15104), (206, 15110), (210, 15158), (222, 15338), (233, 15521),

Gene: Divya\_19 Start: 13712, Stop: 15958, Start Num: 1

Candidate Starts for Divya\_19:

(Start: 1 @13712 has 33 MA's), (3, 13730), (Start: 5 @13760 has 1 MA's), (7, 13817), (14, 13910), (19, 13964), (20, 13976), (21, 13988), (24, 13997), (31, 14054), (43, 14129), (46, 14168), (63, 14378), (70, 14420), (72, 14438), (77, 14477), (83, 14528), (89, 14573), (90, 14579), (98, 14675), (121, 14840), (138, 14960), (140, 14984), (142, 15005), (155, 15062), (161, 15092), (175, 15155), (186, 15257), (223, 15575), (225, 15599), (228, 15623), (231, 15686), (233, 15731), (236, 15842), (238, 15854), (242, 15893),

Gene: EastWest\_20 Start: 13745, Stop: 16369, Start Num: 1

Candidate Starts for EastWest\_20:

(Start: 1 @13745 has 33 MA's), (3, 13760), (4, 13763), (Start: 5 @13790 has 1 MA's), (9, 13901), (22, 14072), (28, 14129), (32, 14156), (39, 14231), (44, 14279), (49, 14399), (53, 14456), (56, 14495), (59, 14513), (61, 14534), (67, 14606), (69, 14621), (71, 14648), (78, 14711), (80, 14732), (84, 14768), (86, 14777), (94, 14909), (113, 15083), (132, 15233), (141, 15338), (144, 15356), (146, 15362), (147, 15374), (165, 15461), (169, 15479), (171, 15485), (173, 15494), (174, 15503), (178, 15539), (182, 15572), (186, 15605), (194, 15647), (199, 15680), (208, 15740), (210, 15767), (215, 15851), (218, 15905), (222, 15947), (225, 15980), (228, 16025), (231, 16088), (232, 16094), (233, 16133), (235, 16238), (237, 16259),

Gene: Franzy\_17 Start: 13434, Stop: 16064, Start Num: 1

Candidate Starts for Franzy\_17:

(Start: 1 @13434 has 33 MA's), (Start: 5 @13482 has 1 MA's), (17, 13701), (22, 13764), (26, 13800), (32, 13848), (40, 13941), (49, 14091), (53, 14148), (56, 14187), (59, 14205), (61, 14226), (62, 14235), (67, 14298), (71, 14340), (76, 14376), (78, 14403), (94, 14601), (96, 14622), (101, 14643), (103, 14667), (107, 14706), (110, 14748), (112, 14772), (113, 14775), (116, 14805), (118, 14841), (120, 14850), (122, 14874), (126, 14892), (128, 14901), (132, 14925), (135, 14946), (141, 15030), (147, 15066), (148, 15072), (149, 15075), (151, 15087), (156, 15108), (157, 15117), (165, 15153), (173, 15186), (174, 15195), (177, 15219), (178, 15231), (179, 15249), (182, 15264), (187, 15300), (188, 15303), (194, 15339), (196, 15354), (199, 15372), (202, 15393), (203, 15402), (208, 15432), (209, 15456), (210, 15459), (222, 15639), (228, 15720), (230, 15762), (231, 15783), (232, 15789), (233,

15828), (235, 15936), (237, 15957), (246, 16032),

Gene: GravityBall\_19 Start: 13748, Stop: 16381, Start Num: 1

Candidate Starts for GravityBall\_19:

(Start: 1 @13748 has 33 MA's), (Start: 5 @13796 has 1 MA's), (12, 13946), (13, 13955), (22, 14078), (32, 14162), (44, 14285), (49, 14405), (53, 14462), (56, 14501), (59, 14519), (61, 14540), (62, 14549), (63, 14588), (67, 14612), (71, 14654), (78, 14717), (84, 14774), (94, 14915), (99, 14948), (102, 14972), (113, 15089), (122, 15188), (124, 15197), (127, 15209), (128, 15215), (131, 15236), (136, 15269), (144, 15362), (149, 15389), (151, 15401), (154, 15413), (157, 15431), (158, 15434), (160, 15443), (168, 15479), (172, 15497), (173, 15500), (174, 15509), (177, 15533), (178, 15545), (179, 15563), (180, 15566), (182, 15578), (187, 15614), (194, 15653), (199, 15686), (202, 15707), (207, 15737), (208, 15746), (210, 15773), (215, 15857), (217, 15902), (222, 15953), (228, 16034), (231, 16097), (232, 16103), (233, 16142), (234, 16247), (237, 16271), (243, 16319), (245, 16340),

Gene: Grekaycon\_19 Start: 13772, Stop: 16402, Start Num: 1

Candidate Starts for Grekaycon\_19:

(Start: 1 @13772 has 33 MA's), (Start: 5 @13820 has 1 MA's), (9, 13931), (17, 14039), (22, 14102), (32, 14186), (40, 14279), (49, 14429), (53, 14486), (56, 14525), (59, 14543), (61, 14564), (62, 14573), (67, 14636), (71, 14678), (76, 14714), (78, 14741), (93, 14927), (96, 14960), (107, 15044), (113, 15113), (120, 15188), (122, 15212), (123, 15218), (127, 15233), (128, 15239), (130, 15251), (132, 15263), (147, 15404), (149, 15413), (151, 15425), (165, 15491), (173, 15524), (174, 15533), (177, 15557), (178, 15569), (182, 15602), (194, 15677), (199, 15710), (202, 15731), (203, 15740), (210, 15797), (213, 15839), (215, 15881), (222, 15977), (228, 16058), (230, 16100), (231, 16121), (232, 16127), (233, 16166), (234, 16268), (237, 16292), (243, 16340), (245, 16361),

Gene: JKerns\_19 Start: 13799, Stop: 16429, Start Num: 1

Candidate Starts for JKerns\_19:

(Start: 1 @13799 has 33 MA's), (Start: 5 @13847 has 1 MA's), (9, 13958), (17, 14066), (22, 14129), (32, 14213), (40, 14306), (44, 14336), (49, 14456), (53, 14513), (56, 14552), (59, 14570), (61, 14591), (62, 14600), (67, 14663), (71, 14705), (76, 14741), (78, 14768), (93, 14954), (96, 14987), (107, 15071), (113, 15140), (122, 15239), (124, 15248), (128, 15266), (130, 15278), (147, 15431), (148, 15437), (149, 15440), (151, 15452), (153, 15458), (156, 15473), (157, 15482), (165, 15518), (173, 15551), (174, 15560), (177, 15584), (178, 15596), (179, 15614), (182, 15629), (187, 15665), (194, 15704), (196, 15719), (199, 15737), (202, 15758), (203, 15767), (208, 15797), (210, 15824), (212, 15857), (213, 15866), (218, 15962), (219, 15974), (221, 15995), (222, 16004), (228, 16085), (230, 16127), (231, 16148), (232, 16154), (233, 16193), (234, 16295), (237, 16319), (243, 16367), (245, 16388),

Gene: Jawnski\_17 Start: 13453, Stop: 16080, Start Num: 1

Candidate Starts for Jawnski\_17:

(Start: 1 @13453 has 33 MA's), (Start: 5 @13501 has 1 MA's), (22, 13783), (26, 13819), (32, 13867), (44, 13990), (49, 14110), (53, 14167), (56, 14206), (59, 14224), (61, 14245), (62, 14254), (67, 14317), (71, 14359), (76, 14395), (78, 14422), (94, 14620), (99, 14653), (110, 14767), (113, 14794), (117, 14842), (123, 14899), (128, 14920), (132, 14944), (141, 15049), (144, 15067), (149, 15094), (151, 15106), (157, 15136), (160, 15148), (165, 15172), (171, 15196), (172, 15202), (173, 15205), (174, 15214), (178, 15250), (179, 15268), (182, 15283), (185, 15304), (190, 15334), (194, 15358), (199, 15391), (202, 15412), (203, 15421), (208, 15451), (210, 15478), (213, 15520), (219, 15628), (220, 15640), (222, 15658), (228, 15736), (230, 15778), (231, 15799), (232, 15805), (233, 15844), (235, 15952), (237, 15973), (246, 16048),

Gene: Jinkies\_21 Start: 16085, Stop: 18541, Start Num: 1

Candidate Starts for Jinkies\_21:

(Start: 1 @16085 has 33 MA's), (Start: 5 @16133 has 1 MA's), (6, 16157), (15, 16325), (16, 16337), (22, 16415), (23, 16427), (37, 16523), (41, 16574), (48, 16661), (51, 16730), (52, 16760), (57, 16811),

(61, 16841), (65, 16895), (68, 16919), (72, 16955), (74, 16970), (79, 17012), (82, 17051), (85, 17066), (94, 17204), (95, 17210), (100, 17240), (116, 17393), (119, 17435), (125, 17480), (129, 17504), (138, 17573), (161, 17690), (175, 17735), (200, 17888), (203, 17912), (214, 18032), (218, 18086), (232, 18269), (233, 18308), (237, 18431), (239, 18443),

Gene: Jordan\_19 Start: 13769, Stop: 16399, Start Num: 1

Candidate Starts for Jordan\_19:

(Start: 1 @13769 has 33 MA's), (Start: 5 @13817 has 1 MA's), (9, 13928), (17, 14036), (22, 14099), (32, 14183), (40, 14276), (44, 14306), (49, 14426), (53, 14483), (56, 14522), (59, 14540), (61, 14561), (62, 14570), (67, 14633), (71, 14675), (76, 14711), (78, 14738), (93, 14924), (96, 14957), (107, 15041), (113, 15110), (122, 15209), (124, 15218), (128, 15236), (130, 15248), (147, 15401), (148, 15407), (149, 15410), (151, 15422), (153, 15428), (156, 15443), (157, 15452), (165, 15488), (173, 15521), (174, 15530), (177, 15554), (178, 15566), (179, 15584), (182, 15599), (187, 15635), (194, 15674), (196, 15689), (199, 15707), (202, 15728), (203, 15737), (208, 15767), (210, 15794), (212, 15827), (213, 15836), (218, 15932), (219, 15944), (221, 15965), (222, 15974), (228, 16055), (230, 16097), (231, 16118), (232, 16124), (233, 16163), (234, 16265), (237, 16289), (243, 16337), (245, 16358),

Gene: King2\_17 Start: 13484, Stop: 16066, Start Num: 5

Candidate Starts for King2\_17:

(Start: 1 @13436 has 33 MA's), (Start: 5 @13484 has 1 MA's), (17, 13703), (22, 13766), (26, 13802), (32, 13850), (35, 13862), (40, 13943), (49, 14093), (53, 14150), (56, 14189), (59, 14207), (61, 14228), (62, 14237), (66, 14294), (67, 14300), (71, 14342), (76, 14378), (78, 14405), (84, 14462), (86, 14471), (87, 14492), (91, 14579), (94, 14603), (96, 14624), (101, 14645), (103, 14669), (107, 14708), (112, 14774), (113, 14777), (116, 14807), (118, 14843), (127, 14897), (128, 14903), (131, 14924), (141, 15032), (144, 15050), (147, 15068), (149, 15077), (151, 15089), (157, 15119), (160, 15131), (165, 15155), (171, 15179), (173, 15188), (174, 15197), (178, 15233), (180, 15254), (182, 15266), (185, 15287), (194, 15341), (199, 15374), (202, 15395), (203, 15404), (208, 15434), (210, 15461), (219, 15611), (220, 15623), (222, 15641), (228, 15722), (230, 15764), (231, 15785), (232, 15791), (233, 15830), (235, 15938), (237, 15959), (246, 16034),

Gene: Klevey\_18 Start: 12975, Stop: 15557, Start Num: 1

Candidate Starts for Klevey\_18:

(Start: 1 @12975 has 33 MA's), (10, 13161), (11, 13170), (28, 13359), (39, 13461), (40, 13479), (44, 13509), (49, 13629), (53, 13686), (56, 13725), (59, 13743), (61, 13764), (67, 13836), (71, 13878), (86, 14007), (91, 14115), (101, 14181), (103, 14205), (110, 14286), (113, 14313), (147, 14604), (151, 14625), (159, 14664), (170, 14712), (181, 14799), (199, 14910), (201, 14928), (202, 14931), (210, 14997), (233, 15333), (236, 15441), (240, 15462),

Gene: LeeroyJ\_19 Start: 13748, Stop: 16381, Start Num: 1

Candidate Starts for LeeroyJ\_19:

(Start: 1 @13748 has 33 MA's), (Start: 5 @13796 has 1 MA's), (12, 13946), (13, 13955), (22, 14078), (32, 14162), (44, 14285), (49, 14405), (53, 14462), (56, 14501), (59, 14519), (61, 14540), (62, 14549), (63, 14588), (67, 14612), (71, 14654), (78, 14717), (84, 14774), (94, 14915), (99, 14948), (102, 14972), (113, 15089), (122, 15188), (124, 15197), (127, 15209), (128, 15215), (131, 15236), (136, 15269), (144, 15362), (149, 15389), (151, 15401), (154, 15413), (157, 15431), (158, 15434), (160, 15443), (168, 15479), (172, 15497), (173, 15500), (174, 15509), (177, 15533), (178, 15545), (179, 15563), (180, 15566), (182, 15578), (187, 15614), (194, 15653), (199, 15686), (202, 15707), (207, 15737), (208, 15746), (210, 15773), (215, 15857), (217, 15902), (222, 15953), (228, 16034), (231, 16097), (232, 16103), (233, 16142), (234, 16247), (237, 16271), (243, 16319), (245, 16340),

Gene: Lilmac1015\_19 Start: 12965, Stop: 15547, Start Num: 1

Candidate Starts for Lilmac1015\_19:

(Start: 1 @12965 has 33 MA's), (10, 13151), (11, 13160), (28, 13349), (39, 13451), (44, 13499), (49, 13619), (53, 13676), (56, 13715), (59, 13733), (61, 13754), (71, 13868), (86, 13997), (91, 14105), (101, 14171), (103, 14195), (113, 14303), (122, 14402), (147, 14594), (151, 14615), (159, 14654), (178, 14759), (181, 14789), (199, 14900), (201, 14918), (202, 14921), (205, 14936), (210, 14987), (213, 15029), (233, 15323), (236, 15431), (240, 15452),

Gene: Martha\_19 Start: 13710, Stop: 16340, Start Num: 1

Candidate Starts for Martha\_19:

(Start: 1 @13710 has 33 MA's), (Start: 5 @13758 has 1 MA's), (9, 13869), (17, 13977), (22, 14040), (32, 14124), (40, 14217), (49, 14367), (53, 14424), (56, 14463), (59, 14481), (61, 14502), (62, 14511), (67, 14574), (71, 14616), (76, 14652), (78, 14679), (93, 14865), (96, 14898), (107, 14982), (113, 15051), (120, 15126), (122, 15150), (123, 15156), (127, 15171), (128, 15177), (130, 15189), (132, 15201), (147, 15342), (149, 15351), (151, 15363), (165, 15429), (173, 15462), (174, 15471), (177, 15495), (178, 15507), (182, 15540), (194, 15615), (199, 15648), (202, 15669), (203, 15678), (210, 15735), (213, 15777), (215, 15819), (222, 15915), (228, 15996), (230, 16038), (231, 16059), (232, 16065), (233, 16104), (234, 16206), (237, 16230), (243, 16278), (245, 16299),

Gene: Nandito\_18 Start: 13061, Stop: 15646, Start Num: 1

Candidate Starts for Nandito\_18:

(Start: 1 @13061 has 33 MA's), (11, 13259), (28, 13448), (30, 13466), (39, 13550), (44, 13598), (49, 13718), (53, 13775), (55, 13811), (56, 13814), (59, 13832), (61, 13853), (71, 13967), (86, 14096), (92, 14207), (101, 14270), (103, 14294), (107, 14333), (110, 14375), (113, 14402), (147, 14693), (151, 14714), (164, 14777), (172, 14810), (174, 14822), (199, 14999), (202, 15020), (210, 15086), (230, 15356), (233, 15422),

Gene: NathanVaag\_17 Start: 13446, Stop: 16073, Start Num: 1

Candidate Starts for NathanVaag\_17:

(Start: 1 @13446 has 33 MA's), (Start: 5 @13494 has 1 MA's), (17, 13713), (22, 13776), (26, 13812), (32, 13860), (35, 13872), (40, 13953), (44, 13983), (49, 14103), (53, 14160), (56, 14199), (59, 14217), (61, 14238), (62, 14247), (67, 14310), (71, 14352), (76, 14388), (78, 14415), (94, 14613), (99, 14646), (110, 14760), (113, 14787), (117, 14835), (122, 14886), (128, 14913), (132, 14937), (141, 15042), (144, 15060), (147, 15078), (149, 15087), (151, 15099), (157, 15129), (160, 15141), (171, 15189), (173, 15198), (174, 15207), (178, 15243), (179, 15261), (182, 15276), (190, 15327), (194, 15351), (199, 15384), (202, 15405), (203, 15414), (208, 15444), (210, 15471), (213, 15513), (216, 15597), (219, 15621), (220, 15633), (222, 15651), (228, 15729), (230, 15771), (231, 15792), (232, 15798), (233, 15837), (237, 15966), (246, 16041),

Gene: Orkz\_22 Start: 13808, Stop: 15943, Start Num: 2

Candidate Starts for Orkz\_22:

(2, 13808), (Start: 5 @13856 has 1 MA's), (7, 13913), (14, 14006), (19, 14060), (21, 14084), (24, 14093), (29, 14141), (31, 14150), (34, 14162), (46, 14264), (54, 14369), (64, 14480), (65, 14486), (77, 14573), (83, 14624), (88, 14666), (89, 14669), (98, 14771), (129, 14912), (134, 14936), (136, 14948), (138, 14981), (150, 15056), (152, 15062), (168, 15119), (175, 15143), (181, 15188), (185, 15212), (192, 15254), (195, 15275), (223, 15542), (227, 15584), (228, 15605), (229, 15608), (232, 15674), (233, 15713), (236, 15827), (241, 15863), (242, 15878), (244, 15893),

Gene: Piccoletto\_17 Start: 13446, Stop: 16073, Start Num: 1

Candidate Starts for Piccoletto\_17:

(Start: 1 @13446 has 33 MA's), (Start: 5 @13494 has 1 MA's), (17, 13713), (22, 13776), (26, 13812), (32, 13860), (35, 13872), (40, 13953), (44, 13983), (49, 14103), (53, 14160), (56, 14199), (59, 14217), (61, 14238), (62, 14247), (63, 14286), (67, 14310), (71, 14352), (76, 14388), (78, 14415), (94, 14613), (96, 14634), (101, 14655), (103, 14679), (105, 14700), (107, 14718), (110, 14760), (113, 14787), (116, 14817), (122, 14886), (128, 14913), (132, 14937), (141, 15042), (148, 15084), (149, 15087), (151,

15099), (157, 15129), (160, 15141), (165, 15165), (171, 15189), (173, 15198), (174, 15207), (178, 15243), (180, 15264), (182, 15276), (190, 15327), (194, 15351), (199, 15384), (202, 15405), (203, 15414), (208, 15444), (210, 15471), (213, 15513), (219, 15621), (220, 15633), (222, 15651), (228, 15729), (230, 15771), (231, 15792), (232, 15798), (233, 15837), (237, 15966), (246, 16041),

Gene: Pippa\_19 Start: 13801, Stop: 16431, Start Num: 1

Candidate Starts for Pippa\_19:

(Start: 1 @13801 has 33 MA's), (Start: 5 @13849 has 1 MA's), (9, 13960), (17, 14068), (22, 14131), (32, 14215), (40, 14308), (44, 14338), (49, 14458), (53, 14515), (56, 14554), (59, 14572), (61, 14593), (62, 14602), (63, 14641), (67, 14665), (71, 14707), (75, 14737), (78, 14770), (91, 14944), (94, 14968), (96, 14989), (101, 15010), (107, 15073), (113, 15142), (116, 15172), (122, 15241), (124, 15250), (128, 15268), (145, 15418), (147, 15433), (148, 15439), (149, 15442), (151, 15454), (156, 15475), (165, 15520), (172, 15550), (174, 15562), (177, 15586), (178, 15598), (182, 15631), (194, 15706), (196, 15721), (199, 15739), (202, 15760), (210, 15826), (215, 15910), (219, 15976), (220, 15988), (222, 16006), (230, 16129), (231, 16150), (232, 16156), (233, 16195), (234, 16297), (237, 16321), (243, 16369), (245, 16390),

Gene: Prairie\_18 Start: 12972, Stop: 15554, Start Num: 1

Candidate Starts for Prairie\_18:

(Start: 1 @12972 has 33 MA's), (10, 13158), (11, 13167), (28, 13356), (39, 13458), (44, 13506), (49, 13626), (53, 13683), (56, 13722), (59, 13740), (61, 13761), (67, 13833), (71, 13875), (86, 14004), (91, 14112), (103, 14202), (113, 14310), (147, 14601), (151, 14622), (159, 14661), (181, 14796), (199, 14907), (201, 14925), (202, 14928), (210, 14994), (233, 15330), (236, 15438), (240, 15459),

Gene: Shade\_19 Start: 13748, Stop: 16378, Start Num: 1

Candidate Starts for Shade\_19:

(Start: 1 @13748 has 33 MA's), (Start: 5 @13796 has 1 MA's), (9, 13907), (17, 14015), (22, 14078), (32, 14162), (40, 14255), (44, 14285), (49, 14405), (53, 14462), (56, 14501), (59, 14519), (61, 14540), (62, 14549), (67, 14612), (71, 14654), (76, 14690), (78, 14717), (93, 14903), (96, 14936), (107, 15020), (113, 15089), (122, 15188), (124, 15197), (128, 15215), (130, 15227), (147, 15380), (148, 15386), (149, 15389), (151, 15401), (153, 15407), (156, 15422), (157, 15431), (165, 15467), (173, 15500), (174, 15509), (177, 15533), (178, 15545), (179, 15563), (182, 15578), (187, 15614), (194, 15653), (196, 15668), (199, 15686), (202, 15707), (203, 15716), (208, 15746), (210, 15773), (212, 15806), (213, 15815), (218, 15911), (219, 15923), (221, 15944), (222, 15953), (228, 16034), (230, 16076), (231, 16097), (232, 16103), (233, 16142), (234, 16244), (237, 16268), (243, 16316), (245, 16337),

Gene: Sonny\_19 Start: 13769, Stop: 16399, Start Num: 1

Candidate Starts for Sonny\_19:

(Start: 1 @13769 has 33 MA's), (Start: 5 @13817 has 1 MA's), (9, 13928), (17, 14036), (22, 14099), (32, 14183), (40, 14276), (44, 14306), (49, 14426), (53, 14483), (56, 14522), (59, 14540), (61, 14561), (62, 14570), (67, 14633), (71, 14675), (76, 14711), (78, 14738), (93, 14924), (96, 14957), (107, 15041), (113, 15110), (122, 15209), (124, 15218), (128, 15236), (130, 15248), (143, 15374), (147, 15401), (148, 15407), (149, 15410), (151, 15422), (153, 15428), (156, 15443), (157, 15452), (165, 15488), (173, 15521), (174, 15530), (177, 15554), (178, 15566), (179, 15584), (182, 15599), (187, 15635), (194, 15674), (196, 15689), (199, 15707), (202, 15728), (203, 15737), (208, 15767), (210, 15794), (212, 15827), (213, 15836), (218, 15932), (219, 15944), (221, 15965), (222, 15974), (228, 16055), (230, 16097), (231, 16118), (232, 16124), (233, 16163), (234, 16265), (237, 16289), (243, 16337), (245, 16358),

Gene: StevieBAY\_19 Start: 13748, Stop: 16381, Start Num: 1

Candidate Starts for StevieBAY\_19:

(Start: 1 @13748 has 33 MA's), (Start: 5 @13796 has 1 MA's), (12, 13946), (13, 13955), (22, 14078), (32, 14162), (44, 14285), (49, 14405), (53, 14462), (56, 14501), (59, 14519), (61, 14540), (62, 14549),

(63, 14588), (67, 14612), (71, 14654), (78, 14717), (84, 14774), (94, 14915), (99, 14948), (102, 14972), (113, 15089), (122, 15188), (124, 15197), (127, 15209), (128, 15215), (131, 15236), (136, 15269), (144, 15362), (149, 15389), (151, 15401), (154, 15413), (157, 15431), (158, 15434), (160, 15443), (168, 15479), (172, 15497), (173, 15500), (174, 15509), (177, 15533), (178, 15545), (179, 15563), (180, 15566), (182, 15578), (187, 15614), (194, 15653), (199, 15686), (202, 15707), (207, 15737), (208, 15746), (210, 15773), (215, 15857), (217, 15902), (222, 15953), (228, 16034), (231, 16097), (232, 16103), (233, 16142), (234, 16247), (237, 16271), (243, 16319), (245, 16340),

Gene: SunnyJune\_20 Start: 15224, Stop: 17671, Start Num: 1

Candidate Starts for SunnyJune\_20:

(Start: 1 @15224 has 33 MA's), (Start: 5 @15272 has 1 MA's), (6, 15296), (15, 15464), (16, 15476), (22, 15554), (23, 15566), (37, 15662), (41, 15713), (48, 15800), (51, 15869), (52, 15899), (57, 15950), (61, 15980), (65, 16034), (68, 16058), (72, 16094), (74, 16109), (79, 16151), (82, 16190), (85, 16205), (94, 16343), (95, 16349), (100, 16379), (116, 16532), (119, 16574), (125, 16619), (129, 16643), (138, 16712), (161, 16829), (175, 16874), (203, 17051), (214, 17171), (218, 17225), (223, 17273), (226, 17303), (232, 17399), (233, 17438), (237, 17561), (245, 17630),

Gene: TaeYoung\_19 Start: 13773, Stop: 16403, Start Num: 1

Candidate Starts for TaeYoung\_19:

(Start: 1 @13773 has 33 MA's), (Start: 5 @13821 has 1 MA's), (9, 13932), (17, 14040), (22, 14103), (32, 14187), (40, 14280), (49, 14430), (53, 14487), (56, 14526), (59, 14544), (61, 14565), (62, 14574), (67, 14637), (71, 14679), (76, 14715), (78, 14742), (93, 14928), (96, 14961), (107, 15045), (113, 15114), (120, 15189), (122, 15213), (123, 15219), (127, 15234), (128, 15240), (130, 15252), (132, 15264), (147, 15405), (149, 15414), (151, 15426), (165, 15492), (173, 15525), (174, 15534), (177, 15558), (178, 15570), (182, 15603), (194, 15678), (199, 15711), (202, 15732), (203, 15741), (210, 15798), (213, 15840), (215, 15882), (222, 15978), (228, 16059), (230, 16101), (231, 16122), (232, 16128), (233, 16167), (234, 16269), (237, 16293), (243, 16341), (245, 16362),

Gene: Timinator\_19 Start: 13748, Stop: 16381, Start Num: 1

Candidate Starts for Timinator\_19:

(Start: 1 @13748 has 33 MA's), (Start: 5 @13796 has 1 MA's), (12, 13946), (13, 13955), (22, 14078), (32, 14162), (44, 14285), (49, 14405), (53, 14462), (56, 14501), (59, 14519), (61, 14540), (62, 14549), (63, 14588), (67, 14612), (71, 14654), (78, 14717), (84, 14774), (94, 14915), (99, 14948), (102, 14972), (113, 15089), (122, 15188), (124, 15197), (127, 15209), (128, 15215), (131, 15236), (136, 15269), (144, 15362), (149, 15389), (151, 15401), (154, 15413), (157, 15431), (158, 15434), (160, 15443), (168, 15479), (172, 15497), (173, 15500), (174, 15509), (177, 15533), (178, 15545), (179, 15563), (180, 15566), (182, 15578), (187, 15614), (194, 15653), (199, 15686), (202, 15707), (207, 15737), (208, 15746), (210, 15773), (215, 15857), (217, 15902), (222, 15953), (228, 16034), (231, 16097), (232, 16103), (233, 16142), (234, 16247), (237, 16271), (243, 16319), (245, 16340),

Gene: Vitus\_19 Start: 14985, Stop: 17510, Start Num: 1

Candidate Starts for Vitus\_19:

(Start: 1 @14985 has 33 MA's), (Start: 5 @15030 has 1 MA's), (11, 15180), (16, 15234), (33, 15387), (39, 15459), (42, 15483), (45, 15522), (49, 15627), (56, 15723), (58, 15735), (59, 15741), (61, 15762), (73, 15894), (89, 16047), (91, 16113), (94, 16137), (101, 16176), (104, 16218), (127, 16344), (128, 16350), (138, 16440), (151, 16536), (156, 16557), (162, 16587), (168, 16614), (171, 16626), (174, 16644), (176, 16650), (182, 16713), (184, 16728), (186, 16746), (191, 16767), (194, 16788), (197, 16809), (199, 16821), (202, 16842), (208, 16881), (210, 16908), (222, 17088), (224, 17097), (228, 17169), (232, 17238), (233, 17277), (234, 17376),

Gene: Zartrosa\_19 Start: 13772, Stop: 16402, Start Num: 1

Candidate Starts for Zartrosa\_19:

(Start: 1 @13772 has 33 MA's), (Start: 5 @13820 has 1 MA's), (9, 13931), (17, 14039), (22, 14102), (32, 14186), (40, 14279), (44, 14309), (49, 14429), (53, 14486), (56, 14525), (59, 14543), (61, 14564), (62, 14573), (67, 14636), (71, 14678), (76, 14714), (78, 14741), (93, 14927), (96, 14960), (107, 15044), (113, 15113), (122, 15212), (124, 15221), (128, 15239), (130, 15251), (147, 15404), (148, 15410), (149, 15413), (151, 15425), (153, 15431), (156, 15446), (157, 15455), (165, 15491), (173, 15524), (174, 15533), (177, 15557), (178, 15569), (179, 15587), (182, 15602), (187, 15638), (194, 15677), (196, 15692), (199, 15710), (202, 15731), (203, 15740), (208, 15770), (210, 15797), (212, 15830), (213, 15839), (218, 15935), (219, 15947), (221, 15968), (222, 15977), (228, 16058), (230, 16100), (231, 16121), (232, 16127), (233, 16166), (234, 16268), (237, 16292), (243, 16340), (245, 16361),