

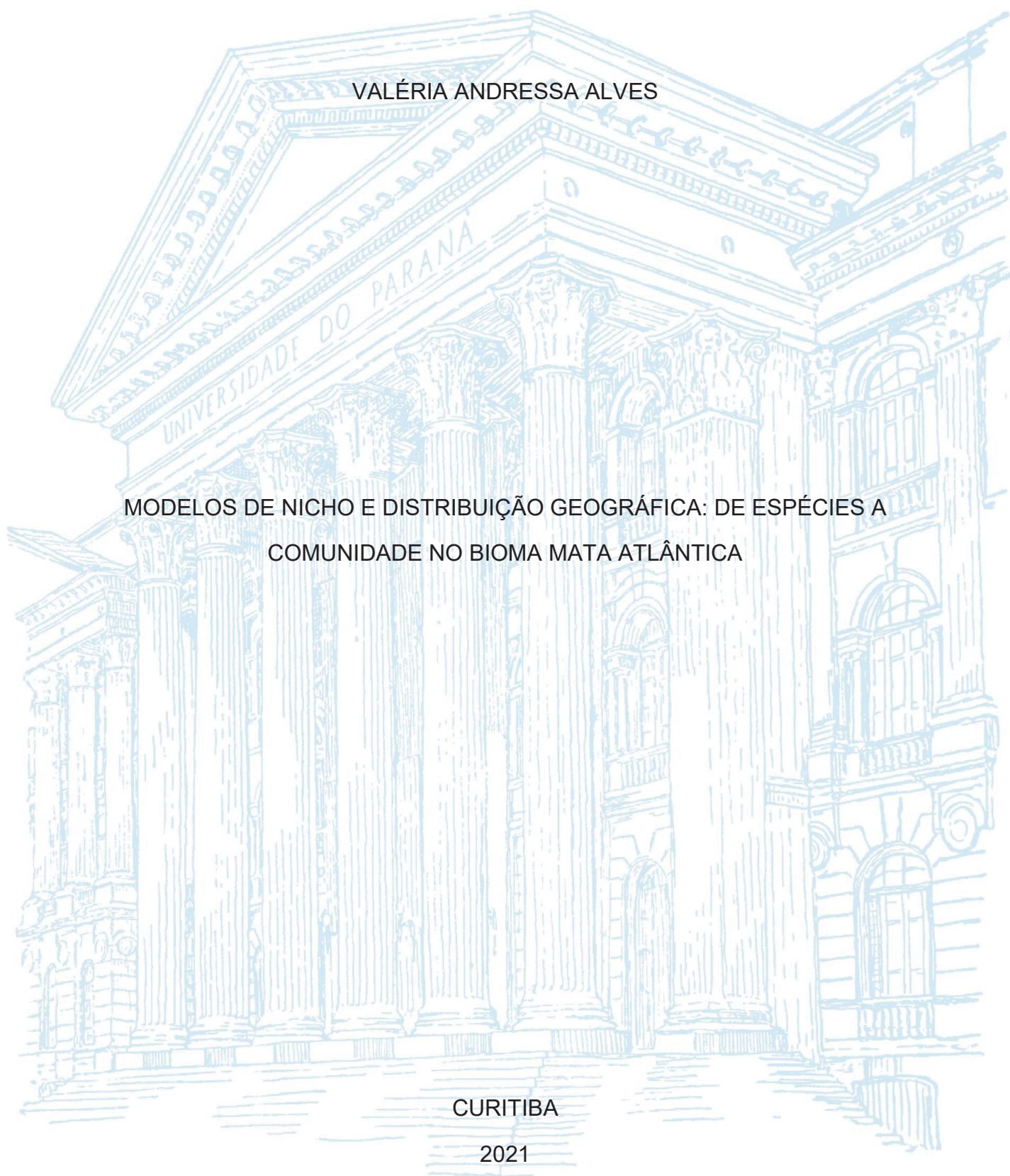
UNIVERSIDADE FEDERAL DO PARANÁ

VALÉRIA ANDRESSA ALVES

MODELOS DE NICHOS E DISTRIBUIÇÃO GEOGRÁFICA: DE ESPÉCIES A
COMUNIDADE NO BIOMA MATA ATLÂNTICA

CURITIBA

2021



VALÉRIA ANDRESSA ALVES

MODELOS DE NICHOS E DISTRIBUIÇÃO GEOGRÁFICA: DE ESPÉCIES A
COMUNIDADE NO BIOMA MATA ATLÂNTICA

Dissertação apresentada ao Programa de
Pós-Graduação em Botânica, Setor de
Ciências Biológicas, Universidade Federal
do Paraná, como requisito parcial à obtenção
do título de Mestre em Botânica.

Orientador: Prof. Dr. Victor Pereira Zwiener

CURITIBA

2021

Universidade Federal do Paraná
Sistema de Bibliotecas
(Giana Mara Seniski Silva – CRB/9 1406)

Alves, Valéria Andressa

Modelos de nicho e distribuição geográfica : de espécies a comunidade
no bioma Mata Atlântica. / Valéria Andressa Alves. – Curitiba, 2021.
184 p.: il.

Orientador: Victor Pereira Zwiener.

Dissertação (mestrado) - Universidade Federal do Paraná, Setor de
Ciências Biológicas. Programa de Pós-Graduação em Botânica.

1. Biogeografia – Mata Atlântica. 2. Biomas. 3. Nicho (Ecologia). I.
Título. II. Zwiener, Victor Pereira, 1982-. III. Universidade Federal do
Paraná. Setor de Ciências Biológicas. Programa de Pós-Graduação em
Botânica.

CDD (22. ed.) 581.98

ATA DE SESSÃO PÚBLICA DE DEFESA DE MESTRADO PARA A OBTENÇÃO DO GRAU DE MESTRA EM BOTÂNICA

No dia vinte e sete de setembro de dois mil e vinte e um às 09 horas, na sala [Curitiba, 27 de Setembro de 2021.](https://teams.microsoft.com/l/meetup-join/19%3ameeting_NzEwYTJmMjMtYTMT4MS00NmM2LWI5NTEtMTU0YzRkYTExYTli%40thread.v2/0?context=%7b%22Tid%22%3a%22c37b37a3-e9e2-42f9-bc67-4b9b738e1df0%22%2c%22Oid%22%3a, VIDEOCONFERÊNCIA, foram instaladas as atividades pertinentes ao rito de defesa de dissertação da mestranda VALERIA ANDRESSA ALVES, intitulada: Modelos de nicho e distribuição geográfica: de espécies a comunidade no bioma Mata Atlântica, sob orientação do Prof. Dr. VICTOR PEREIRA ZWIENER. A Banca Examinadora, designada pelo Colegiado do Programa de Pós-Graduação em BOTÂNICA da Universidade Federal do Paraná, foi constituída pelos seguintes Membros: VICTOR PEREIRA ZWIENER (UNIVERSIDADE FEDERAL DO PARANÁ), PAULO DE MARCO JÚNIOR (UNIVERSIDADE FEDERAL DE GOIÁS), MARCOS BERGMANN CARLUCCI (UNIVERSIDADE FEDERAL DO PARANÁ). A presidência iniciou os ritos definidos pelo Colegiado do Programa e, após exarados os pareceres dos membros do comitê examinador e da respectiva contra argumentação, ocorreu a leitura do parecer final da banca examinadora, que decidiu pela APROVAÇÃO. Este resultado deverá ser homologado pelo Colegiado do programa, mediante o atendimento de todas as indicações e correções solicitadas pela banca dentro dos prazos regimentais definidos pelo programa. A outorga de título de mestra está condicionada ao atendimento de todos os requisitos e prazos determinados no regimento do Programa de Pós-Graduação. Nada mais havendo a tratar a presidência deu por encerrada a sessão, da qual eu, VICTOR PEREIRA ZWIENER, lavrei a presente ata, que vai assinada por mim e pelos demais membros da Comissão Examinadora.</p></div><div data-bbox=)

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Os membros da Banca Examinadora designada pelo Colegiado do Programa de Pós-Graduação em BOTÂNICA da Universidade Federal do Paraná foram convocados para realizar a arguição da dissertação de Mestrado de **VALERIA ANDRESSA ALVES** intitulada: **Modelos de nicho e distribuição geográfica: de espécies a comunidade no bioma Mata Atlântica**, sob orientação do Prof. Dr. VICTOR PEREIRA ZWIENER, que após terem inquirido a aluna e realizada a avaliação do trabalho, são de parecer pela sua APROVAÇÃO no rito de defesa.

A outorga do título de mestra está sujeita à homologação pelo colegiado, ao atendimento de todas as indicações e correções solicitadas pela banca e ao pleno atendimento das demandas regimentais do Programa de Pós-Graduação.

Curitiba, 27 de Setembro de 2021.

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Dedico a minha família, por quem despendo todo o meu amor, meu carinho e minha dedicação. Tenho orgulho de caminhar ao lado de vocês.

AGRADECIMENTOS

Agradeço,

Ao Programa de Pós-Graduação em Botânica da UFPR e a Capes pela bolsa de estudos.

Em especial, ao meu orientador, Victor P. Zwiener. Pelo profissional que é, pela sensibilidade e cordialidade com que sempre me tratou e por todo empenho que despendeu para desenvolvermos esse trabalho.

A professora Márcia Marques e as biólogas Jaqueline de Lima Pessato e Fabiane Maziero Kupas, por terem compilado os inventários florestais usados nesse estudo.

A Deus e aos Santos rogados, por terem acalmado o meu coração, renovado a minha fé e por terem me mostrado que viver vale a pena.

A minha amada Mãe Ana e ao meu querido Pai José, por todos os momentos compartilhados, pelos exemplos íntegros, por todo amor e apoio. Serei eternamente grata por ter nascido filha de vocês!

A minha irmã Cláudia, pelas cervejas, petiscos e bolos, pela amizade sincera e por todo amor. Gratidão por cuidar de mim, por ficar ao meu lado nos momentos mais difíceis dessa caminhada, por acolher meus devaneios e perdoar minhas falhas. Esse trabalho é tão meu quanto seu. Amo você!

Aos amigos que cruzaram minha vida ao longo dessa jornada, pelas incríveis memórias vividas, pelo estímulo e pela compreensão. Em particular, a Luana P. de Souza, a nordestina mais arretada que conheço. Gratidão pelos 'xeros', conversas, risadas e por aquecer o meu coração.

E a todos que de alguma forma contribuíram para a elaboração desse manuscrito.

RESUMO

Resumo. Entender a distribuição das espécies e os padrões de riqueza tem sido um dos grandes questionamentos de ecólogos e biogeógrafos ao longo das décadas. Ainda mais diante ao cenário atual de mudanças climáticas e fragmentação de habitats, que exigem planos de conservação e ações de gestão mais eficazes da biodiversidade. As previsões da diversidade biológica podem ser úteis para esse propósito e são frequentemente geradas por modelos de nicho ecológico (ENM) e de distribuição potencial (SDM). Em vista disso, testamos a capacidade dos SDMs em capturar parte das variações das comunidades locais e, especialmente, sua habilidade em prever os padrões de riqueza de espécies e composição observados em inventários de campo. Usando dados de 1499 espécies arbóreas distribuídas em 213 inventários florestais ao longo da Mata Atlântica brasileira, aplicamos quatro abordagens para reconstruir as comunidades vegetais: empilhamento binário de SDMs (bS-SDM), modelos de distribuição de espécies binárias cortadas por polígonos convexos mínimos (bS-SDM-CROP), binário restrito com a riqueza de espécie e pela regra de classificação de probabilidade (cS-SDM) e, polígonos convexos mínimos (MCP). As comunidades modeladas foram comparadas com comunidades observadas em inventários de campo, com base na riqueza de espécies, composição, beta dissimilaridade e suas partições e, métricas de desempenho preditivo. Apesar de potencialmente superestimar os valores de riqueza de espécies, os S-SDMs, conseguiram capturar parte da variação das comunidades locais, os padrões espaciais previstos de riqueza de espécies acompanharam o padrão geral encontrado nos inventários de campo, sendo encontrada uma relação significativa e positiva. Independente da estratégia de modelagem, a composição de espécies nas comunidades modeladas foi diferente da observada nas comunidades locais. Os erros na previsão fizeram com que algumas espécies consideradas como vulneráveis, em perigo ou criticamente ameaçadas, deixassem de serem previstas nas comunidades modeladas. As restrições impostas nos cS-SDMS não foram capazes de reproduzir as regras de montagem de uma floresta tropical megadiversa, sobretudo, os cS-SDMS não melhoraram drasticamente as previsões da composição de espécies. As restrições espaciais impostas nos bS-SDMs-CROP, através dos MCPs, reduziram o excesso de previsão e melhoraram o desempenho dos SDMs. Todavia, as previsões somente com MCPs produziram padrão de riqueza de espécies diferente do observado em campo. Ainda, a análise da partição da diversidade beta sugere que comunidades bS-SDM e bS-SDM-CROP seguem um padrão aninhado e podem representar o conjunto potencial de espécies em largas escalas. Entretanto, as comunidades cS-SDM

possuíram uma alta substituição de espécies em relação as comunidades reais. Por fim, as limitações encontradas nos S-SDMs aparentemente não invalidam suas estimativas e os resultados sugerem que eles podem endossar a síntese da biodiversidade e o planejamento da conservação em larga escala. Podendo ser úteis em florestas tropicais ameaçadas, que atualmente sofrem intensamente com a fragmentação e as mudanças climáticas, e necessitam de ações eficazes para mitigar tais efeitos.

Palavras-chave: Mata Atlântica. Riqueza de espécies. Composição de espécies. Aninhamento. Turnover.

ABSTRACT

Abstract. Explaining and understanding species distribution and richness patterns have been a bigger question for ecologists and biogeographers over the decades. Even more so in the current scenario of climate change and habitat fragmentation. This requires conservation plans, management actions, and more effective management of biodiversity. Predictions of biological diversity can be useful for this purpose and are often generated by ecological niche models (ENM) and potential distribution models (SDM). Because of this, we tested the ability of SDMs to capture some of the variations in local communities, and especially their ability to predict the patterns of species richness and compositional characteristics observed in field inventories. We generated SDMs for 1499 tree species sampled in 213 forest inventories across the Brazilian Atlantic Forest. We applied four model stacking approaches to reconstruct the plant communities: binary SDMs (bS-SDM), binary SDMs cropped by minimum convex polygons (bS-SDM-CROP), binary SDMs constrained by the observed species richness and the probability ranking rule (cS-SDM), and minimum convex polygons (MCP). We compared the stacking methods with local communities in terms of species richness, composition, community prediction performance metrics, and components of beta diversity. Despite it potentially overestimating species richness values, the S-SDMs managed to capture some of the variations in local communities, the predicted spatial patterns of species richness followed the general pattern found in field inventories. Including a significant and positive relationship was found. Regardless of the modeling strategy, the species composition in the modeled communities was dissimilar from that observed in the local communities. The prediction errors caused some species considered as vulnerable, endangered, or critically endangered to no longer be predicted in the modeled communities. The constraints imposed on the cS-SDMS were not able to reproduce the assemblage rules found in a megadiverse tropical forest. In particular, the cS-SDMS did not dramatically improve the composition predictions. The spatial constraints imposed on cS-SDMSs-CROP through MCPs reduced over-prediction and improved the performance of the SDMs. However, predictions with MCPs alone produced a different pattern of species richness than observed in the field inventories. Furthermore, beta diversity partitioning analysis suggests that BS-SDM and BS-SDM-CROP communities follow a nested pattern and may represent potential species assemblages at larger scales. However, cS-SDM communities had a high species substitution relative to real communities. Finally, the limitations found in S-SDMs do not invalidate their estimates and the results suggest that they can endorse biodiversity synthesis and conservation planning at larger scales. They can be useful in endangered tropical forests,

which currently suffer intensely from fragmentation and climate change, and need effective actions to mitigate such effects.

Keywords: Atlantic Forest. Species richness. Species composition. Nestedness. Turnover.

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LISTA DE ABREVIATURAS OU SIGLAS

AF - Atlantic Forest

β_{jac} - Jaccard β eta-dissimilarity.

β_{jne} - β eta-nestedness. Fraction of the Jaccard β eta-dissimilarity.

β_{jtu} - β eta-turnover. Fraction of Jaccard β eta-dissimilarity.

bS-SDM - Stacked the binary SDMS.

bS-SDM-CROP - Stacked the binary SDMs cropped by minimum convex polygons.

cS-SDM - Binary SDMs constrained by the observed species richness.

ENMs - Ecological Niche Modelling.

MCP - Minimum convex polygons.

SDMs - Species distribution modelling

SR - Species richness

S-SDMs - Stacked species distribution models

DRP - Predicted richness deviation

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INTRODUÇÃO GERAL

Diversos modelos foram propostos para ajudar a explicar os padrões de distribuição das espécies e as comunidades ecológicas, seus atributos de riqueza, composição e os papéis ecológicos das espécies. Uma abordagem amplamente difundida para esses propósitos, é a modelagem de nicho ecológico (“ecological niche modeling” – ENM) e a modelagem de distribuição de espécies (“species distribution modeling” – SDM) (GUISAN & ZIMMERMANN, 2000; SOBERON & NAKAMURA, 2009).

Nela, os nichos são reconstruídos relacionando os dados de ocorrência (subamostras da distribuição real da espécie) com um conjunto de variáveis representativas das condições ambientais, através de métodos analíticos (algoritmos e modelos) (GUISAN & ZIMMERMANN, 2000; SOBERON & NAKAMURA, 2009). Dessa associação é gerado valores de adequabilidade ambiental, que posteriormente são usados para identificar as áreas de presença prevista da espécie no espaço geográfico. Assim, os SDMs seguem uma modelagem dedutiva, baseada no conhecimento especializado das exigências ambientais ou de habitat das espécies (FERRIER et al., 2017).

Seu uso frequente é concomitante à crescente aplicação dos sistemas de informações geográficas (GIS) no sensoriamento remoto e ao surgimento de bancos de dados biológicos digitais (e.g. Global Biodiversity Information Facility e SpeciesLink) (LEITÃO & SANTOS, 2019). Que tornaram disponíveis dados georreferenciados e informações ambientais em diversas extensões espaciais e resoluções, e ainda, compartilham informações biológicas sobre os táxons de forma gratuita. Abastecidos com essas informações, os SDMs podem ser úteis para tratar de uma variedade de problemas em diferentes escalas, como por exemplo, no planejamento de conservação e seleção de áreas prioritárias

(BONFIM et al., 2019; ZWIENER et al, 2017), no manejo e conservação de espécies, na predição de efeitos das alterações climáticas nas espécies e nos ecossistemas (ESSER et al., 2019) na expansão de espécies invasoras ou exóticas (BELLO et al., 2021) e na predição de distribuição de espécies raras ou ameaçadas de extinção.

O conceito de nicho ecológico

O nicho ecológico é o principal fundamento na modelagem de distribuição de espécie (PETERSON, 2011). As primeiras discussões sobre o nicho são atribuídas a Joseph Grinnel (GRINNELL 1904, 1917, 1924), o conceito de nicho ecológico grinnelliano consiste a um espaço que determina as condições ambientais nas quais a espécie seria capaz de ocorrer e se reproduzir (GRINNELL, 1928). Posteriormente, Charles Elton (1927) deu ênfase a termos de hábitos alimentares da espécie analisando tanto o impacto sofrido pela espécie quanto o que ela causa em seu ambiente (VANDERMEER, 1972), propondo o nicho como o papel funcional em que a espécie representa dentro de sua cadeia trófica (ELTON, 1927). Mas, embora Grinnell e Elton estivessem apontando para fenômenos muito diferentes, ambas as interpretações identificam o nicho como um atributo do meio ambiente e não como um atributo da espécie (GRAY & LOWERY, 1996).

Evelyn Hutchinson tentou reduzir essa ambiguidade agregando os conceitos de nicho ecológico, o definindo como “um hiper-espaço n-dimensional” (HUTCHINSON, 1944) onde cada eixo ou dimensão representa um fator ambiental diferente e todos os fatores juntos agem sobre o organismo. Vale ressaltar, que Hutchinson (1957) substituiu posteriormente o termo "hiper-espaço" por "hiper-volume" e diferenciou o nicho ecológico em nicho

fundamental e o nicho realizado Hutchinson (1959). O nicho fundamental, também conhecido como “nicho Grinelliano”, está relacionado as características físicas do habitat e às necessidades fisiológicas das espécies, enquanto, o nicho realizado tem enfoque biológico e representa o local realmente ocupado, dadas as interações com outras espécies (e.g competição) (WHITTAKER et al., 1973). Portanto, seguindo essa visão o nicho pode ser identificado especificando os relacionamentos entre uma população e as variáveis em seu ambiente que afetam sua sobrevivência.

Ainda, Hutchinson propôs que o nicho ecológico apresentava uma interface no espaço geográfico (bidimensional) que se refere à localização espacial da espécie, e outra sobre o espaço ambiental (multidimensional) que se refere ao nicho dimensional de Hutchinson (COLWELL e RANGEL, 2009). O espaço ambiental citado é relativo a duas variáveis que agem em conjunto: as variáveis condição ou cenopoéticas que são definidas como atributos ambientais e as variáveis recurso ou bionômicas que se modificam durante o processo de construção do nicho, guiadas pela dinâmica das espécies (HUTCHINSON, 1957; SOBERÓN, 2007). Esta dualidade entre o espaço ambiental e geográfico é conhecida como “dualidade de Hutchinson” (COLWELL e RANGEL, 2009).

Com base nos conceitos apresentados, os ENMs/SDMs são explicitamente baseados ou na suposição do nicho Grinelliano fundamental ou do nicho Hutchinsoniano realizado (GUISAN & THUILLER, 2005). Dado que o nicho Grinelliano fundamental considera a ocorrência da espécie nos habitats onde as condições ambientais são adequadas (PULLIAM, 2000; SOBERÓN & NAKAMURA, 2009). E por outro lado, na visão de Hutchinson, onde as espécies podem ser excluídas de uma porção de seu nicho fundamental por interações bióticas (e.g competição, predação, facilitação etc.), resultando no nicho

percebido ou realizado o que é realmente observado na natureza (GUISAN & THUILLER, 2005; GUISAN & ZIMMERMANN, 2000).

Diagrama de BAM e a modelagem preditiva

Contudo, nenhum dos conceitos considera as questões temporais do nicho, a escala e capacidade de dispersão das espécies. Então, Soberón e Peterson (2005) propuseram que o nicho de uma espécie seria delimitado por três espaços independentes: biótico (B), abiótico (A) e área de movimento (M). Esses fatores agem conjuntamente e afetam a distribuição das espécies, podendo ser resumidos em um diagrama: Biótico-Abiótico-Mobilidade, mais conhecido como diagrama BAM (PETERSON et al., 2011; SOBERÓN & PETERSON, 2005). Em que “**B**” é a região onde as variáveis bióticas que afetam o uso de recursos e as interações biológicas permitem o crescimento das populações (loais em que a espécie pode coexistir ou se sobressair contra competidores), “**A**” região em que os fatores abióticos permitem a existência da espécie (equivalente à expressão geográfica do nicho fundamental) e “**M**” é a área que está dentro da capacidade de dispersão da espécie em questão, seja na atualidade ou no passado relevante (SOBERÓN & PETERSON, 2005).

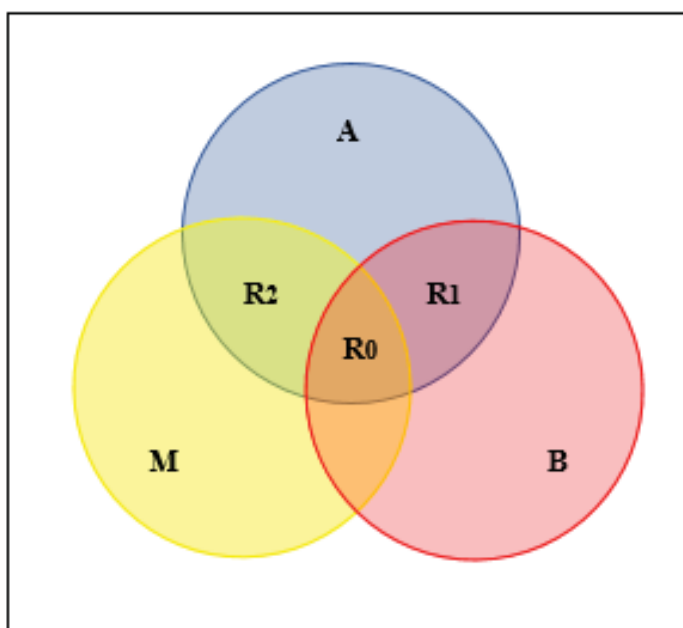


Figura 1. Representação do diagrama de **BAM** (Biótico-Abiótico-Movimento), adaptado a partir de Soberón & Peterson (2005). Os círculos fechados representam os três espaços independentes que delimitam o nicho e determinam a distribuição geográfica de uma espécie. **B**: fatores bióticos, sendo interações ou variáveis ligadas aos recursos; **A**: fatores abióticos ou ambientais; e **M**: movimento ou dispersão, representando as regiões que são acessíveis às espécies. **R0**: Área que representa a distribuição geográfica real da espécie; **R1**: Área potencial para a ocupação com situações A e B favoráveis, mas não acessível a espécie; **R2**: Área normalmente representada nos ENMs.

A região de intersecção representada por “**R1**” expressa a área que pode ser potencialmente invadada pela espécie, uma vez que essa área possui condições abióticas e bióticas são favoráveis, mas que ainda não alcançada pela espécie devido a existência de barreiras à dispersão (SOBERÓN & PETERSON, 2005). A região de intersecção representada por “**R0**” expressa a área real da distribuição geográfica da espécie (SOBERÓN & PETERSON,

2005). A região de intersecção que ligam os fatores abióticos e área acessível para a espécie dada por “**R²**”, representa a área mais utilizada para a construção dos ENMs/SDMs.

Portanto, o diagrama descreve a relação entre o espaço geográfico e ambiental, possibilitando a geração de um mapa de adequabilidade ambiental que descreve o nicho de uma espécie e, conseqüentemente, permite a modelagem da distribuição geográfica de espécies, como resposta as mudanças ambientais ao longo do tempo (SOBERÓN & PETERSON, 2005; SOBERÓN & NAKAMURA, 2009).

Modelagem preditiva em nível de comunidade

A princípio os SDMs assumem em suas simulações espécies individualmente, mas, podem ser combinadas para fazer previsões em nível de comunidades (FERRIER & GUIBAN, 2006; SOBERON & NAKAMURA, 2009). Permitindo estimar a riqueza espécie e a composição de uma comunidade (DUBUIS et al., 2011). A estratégia mais popular para isso, envolve modelar individualmente as espécies e posteriormente sobrepor ou “empilhar” suas previsões binárias (estratégia conhecida em inglês como “stacked species distribution models”- S-SDMs) (GUIBAN & RAHBEK, 2011; MATEO et al., 2012). O pressuposto teórico subjacente ao S-SDM, segue as ideias de Gleason (1926), afirmando que uma comunidade local é composta por um conjunto de espécies que compartilham, relativamente, os mesmos requisitos ambientais, e em particular, assumem o equilíbrio e a estabilidade de nicho (GUIBAN & RAHBEK, 2011). E como as comunidades derivadas de S-SDMs são fortemente moldadas pelas variáveis ambientais, podem representar agregações de espécies resultantes de coincidências aleatórias de seleção ambiental.

No entanto, o que determina a distribuição geográfica das espécies na natureza vai muito além dos requisitos abióticos, uma complexidade de outros fatores ecológicos e evolutivos, atuantes em diferentes escalas temporais e espaciais, também são fortes determinantes (GUISAN & THUILLER, 2005). Como por exemplo, interações bióticas positivas e negativas, processos de dispersão, perturbações antrópicas e distúrbios naturais (GASTON, 2000; SOBERÓN, 2007). Ao mesmo tempo, esses fatores podem atuar de forma não exclusiva e como sucessivos filtros ecológicos e biogeográficos, restringindo a composição das espécies nas comunidades (GÖTZENBERGER et al., 2012; KEDDY, 1992). Portanto, os S-SDMs deixam de incorporar fatores importantes para as espécies (GUISAN & THUILLER, 2005), favorecendo a previsão excessiva da riqueza de espécies e desvios na composição de espécies nas comunidades modeladas (CALABRESE et al., 2013; PINTO-LEDEZMA & CAVENDER-BARES, 2020). Além disso, a incerteza associada aos dados de entrada (registros de ocorrência e variáveis ambientais) pode impactar negativamente as previsões dos SDMs e, conseqüentemente, a confiabilidade desses modelos de biodiversidade (GRAHAM et al., 2008).

Embora a precisão das previsões de riqueza de espécie e composição de espécies já tenha sido avaliada, principalmente comparando estratégias de modelagem diferentes (D'AMEN et al. 2015; DEL TORO et al, 2018; ZURREL et al., 2020), são raríssimos os estudos que buscam comparar as previsões explícitas de comunidades modeladas com comunidades observadas em campo de ambientes megadiversos. Sobretudo, porque são observadas diferenças no esforço amostral e divergências na escala temporal e espacial (e.g. tamanho da unidade amostral) (WIENS et al., 2009), vieses que podem dificultar comparações entre elas. Essas limitações e as demais incertezas associadas a natureza das comunidades, podem favorecer com que os S-SDMs produzam

comunidades com propriedades emergentes e as características composicionais diferentes das comunidades locais. No entanto, o que é urgente e necessário são S-SDMs que consigam capturar a essência dos mecanismos biológicos, fisiológicos e ecológicos existentes nos sistemas em questão. E que principalmente, sejam capazes de reproduzir os padrões gerais de diversidade encontrados na natureza.

Aplicação

Bons modelos seriam ferramentas auxiliadoras na implementação de ações eficazes de conservação em escalas locais e no desenvolvimento de políticas que favoreçam o manejo adequado da biodiversidade e dos serviços ecossistêmicos em ambientes megadiversos, como a Mata Atlântica brasileira. Que embora seja um dos principais hotspots de biodiversidade do planeta, possuindo uma riqueza de espécies excepcional e níveis altíssimos de endemismo (JOLY et al., 2014; MYERS et al., 2000), está listada como uma das regiões mais vulneráveis, devido às alterações no uso e cobertura da terra, mudanças climáticas e aos efeitos negativos de espécies invasoras (MITTERMEIER et al., 2011).

Em vista disso, a presente dissertação apresentada por um único capítulo, buscou comparar os padrões de riqueza e composição de espécies arbóreas em comunidades derivadas de modelos de distribuição potencial (SDMs), com comunidades derivadas de inventários florestais. A ideia geral do método proposto é apresentada na figura 2. Em especial, discutimos a capacidade dos SDMs de capturar as propriedades emergentes e os padrões gerais de diversidade biológica observados na Mata Atlântica. E o papel dos

componentes de β -turnover e β -aninhamento explicando as diferenças composicionais (β -dissimilaridade) encontradas entre as comunidades.

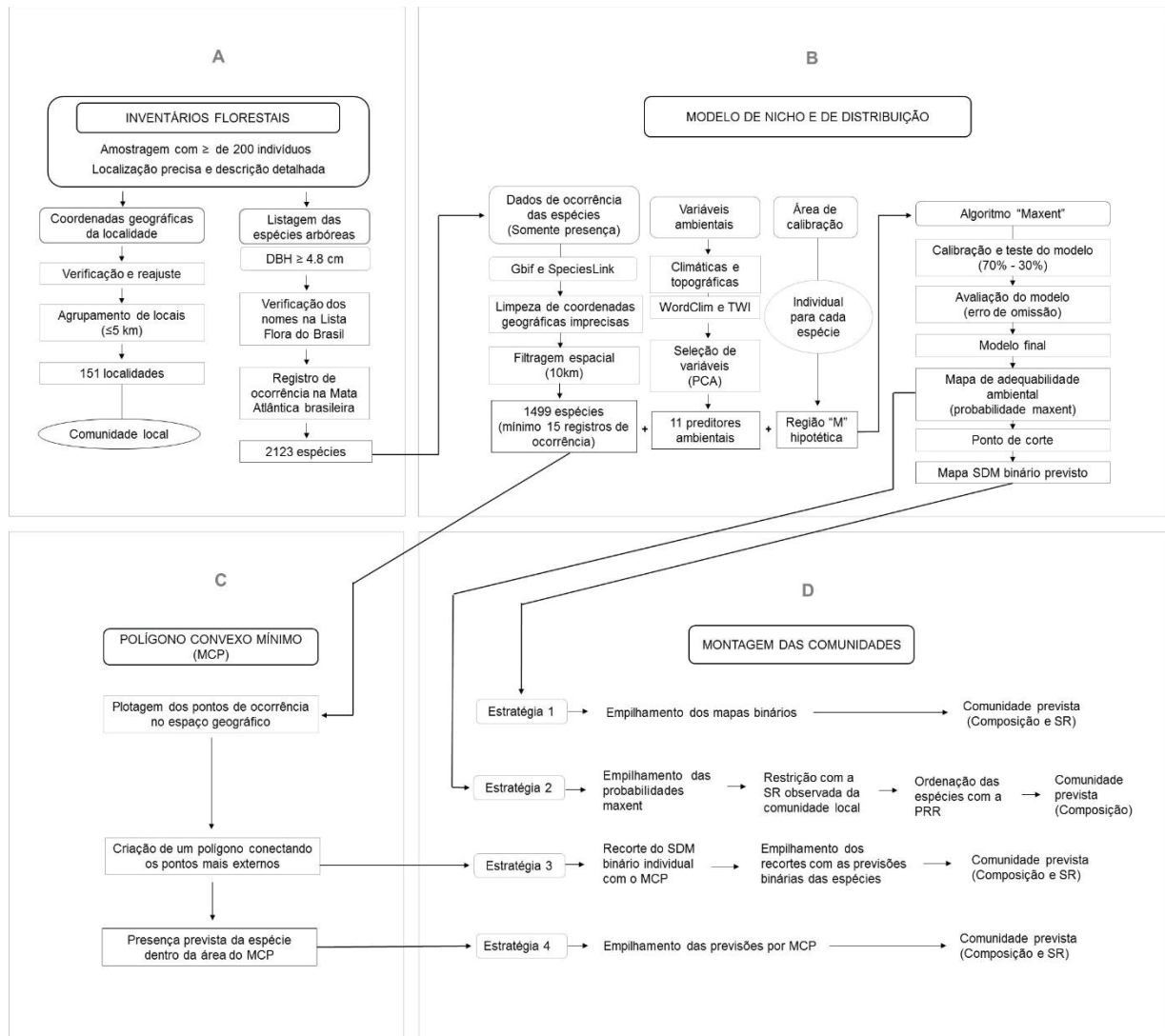


Figura 2. Diagrama geral detalhando método proposto para construir as comunidades comparadas na dissertação. A) Etapa que compilamos os inventários florestais independentes que capturaram a composição de espécies arbóreas de diversas comunidades locais localizadas ao longo da Mata Atlântica e, posteriormente, extraímos informações relevantes para o presente estudo. B) Etapa que executamos a modelagem do nicho ecológico das espécies individualmente e projetamos sua distribuição potencial (SDM) no espaço geográfico. C) Etapa em que estimamos a distribuição das espécies, individualmente, utilizando o método simplista do Mínimo Polígono Convexo (MPC). D) Etapa que reconstruímos as comunidades vegetais e obtivemos as previsões de composição e riqueza de espécie (SR). Utilizamos quatro estratégias distintas: Estratégia 1 – empilhamento de SDMs binário (bS-SDM), Estratégia 2 – empilhamento de SDMs binário restritos com a riqueza de espécie (SR) e pela regra de classificação de probabilidade (PRR) (cS-SDM), Estratégia 3 – empilhamento SDMs binário cortados por polígonos convexos mínimos (bS-SDM-CROP) e Estratégia 4 – empilhamento das previsões individuais derivadas dos polígonos convexos mínimos (MCP).

Running title: Stacked Species Distribution Models in the Atlantic Forest

**Community-level predictions in a megadiverse hotspot: how stacked species
distribution models compare to forest inventory data?**

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Abstract

Aims

Given the current scenario of climate change and anthropogenic impacts, spatial predictions of biodiversity are fundamental to support conservation and restoration actions. Here, we compared different stacked species distribution models (S-SDMs) to forest inventories to assess if S-SDMs capture emerging properties and geographic patterns of species richness and composition of local communities in a biodiversity hotspot.

Methods

We generated SDMs for 1499 tree species sampled in 213 forest inventories across the Brazilian Atlantic Forest. We applied four model stacking approaches to reconstruct the plant communities: binary SDMs (bS-SDM), binary SDMs cropped by minimum convex polygons (bS-SDM-CROP), binary SDMs constrained by the observed species richness (cS-SDM) and minimum convex polygons (MCP). We compared the stacking methods with local communities in terms of species richness, composition, community prediction performance metrics, and components of beta diversity.

Important Findings

Despite overestimating species richness, bS-SDM, bS-SDM-CROP captured general patterns. Species richness deviations were partially explained by sampling intensity at local communities. Species composition differed between local communities and all stacking methods, in which bS-SDM, bS-SDM-CROP and MCP followed a nested pattern, whereas species turnover was most important in cS-SDM. S-SDMs varied in terms of performance, omission and commission errors, leading to misprediction of some vulnerable, endangered, and critically endangered species. Our results support that S-

SDMs may represent the potential species pool at coarse scales and should not be interpreted at local scales. However, S-SDMs captured part of the variations from local communities and may endorse biodiversity synthesis and conservation planning at coarse scales.

Keywords: Atlantic Forest, species richness, species composition, nestedness, turnover

48 **Introduction**

49 Understanding how biodiversity is distributed across the globe has been one of the
50 great challenges for ecologist and biogeographers over decades (Butchart *et al.* 2010).
51 Such challenge is amplified in tropical forests that have exceptional biodiversity, but also
52 a long history of degradation (Joly *et al.* 2014; Myers *et al.* 2000). For instance, it is
53 estimated that the Atlantic Forest hotspot is home to c.a. 15,004 seed plant species of
54 which 7,432 are endemic and 1,544 are in risk of extinction (Martinelli & Moraes, 2013;
55 Zappi *et al.* 2015). In this context, it is particularly important to monitor species richness
56 (SR) and composition, and understand the processes that structure ecological
57 communities to support actions for conservation of biodiversity. However, extensive
58 forest inventories are time-consuming and expensive and can leave gaps in unsampled
59 areas. An alternative way to this fact and monitor the spatiotemporal patterns of species
60 richness and composition is by species distribution models (SDMs) (Araújo and Peterson
61 2012; Guisan *et al.* 2013).

62 SDMs aim to predict the potential species' geographic distribution, based on
63 associations of species' occurrences with the environment (Guisan and Thuiller 2005;
64 Soberón and Nakamura 2009). Most applications of SDMs aim at individual species
65 estimates, however, to obtain information on species richness and composition, it is
66 necessary to reconstruct communities. One of the strategies that has been used for this is
67 stacking individual predictions (S-SDM, Guisan and Rahbek 2011), based on binary
68 SDMs (bS-SDMS), following the criterion of 'predict first, assemble later' (Dubuis *et al.*
69 2011; Guisan and Thuiller 2005; Pineda and Lobo, 2009). This approach has the
70 advantage of been able to consider specific characteristics (Guisan and Thuiller 2005),
71 such as accessible regions, which may vary from species to species (Cooper and Soberón

2018). However, the assembly by bS-SDMs does not assume rules to limit the number of species that can occupy a given site and also does not incorporate - or only implicitly - ecological interactions (Guisan *et al.* 2006, Guisan and Rahbek 2011). Without these restrictions, bS-SDMs predict the entire set of species that are environmentally suitable to occupy a given region and therefore may potentially overestimate the species richness and composition at the site level (Calabrese *et al.* 2013; Hortal *et al.* 2012; Pineda and Lobo 2009; but see Cooper and Soberón 2018). A suggested alternative to minimize this effect is to incorporate into the S-SDMs some ecological assembly rules to constrain the prediction of communities following an 'assemble first, predict later' approach (Calabrese *et al.* 2013; Guisan and Rahbek 2011; Pinto-Ledezma and Cavender-Bares 2020). In constrained binaries (cS-SDMs), limits are set on one or more emergent community properties (e.g., species richness), which restrict the number of species that can co-occur in a given area. Another even simpler alternative to reduce overprediction is by applying *a posteriori* spatial constraints, such as cropping SDMs with a minimum convex polygon (MCP) that encompasses species occurrences (Mendes *et al.* 2020).

Theoretically, the assumption assumed by the bS-SDMs is that ecological communities are Gleasonian (Gleason, 1926), composed of a set of species that share the same environmental requirements, and in particular, assume the balance and stability of niche (Guisan and Rahbek 2011; Wiens *et al.* 2009). In contrast, the cS-SDMs assumes that ecological communities are a complex combination of a fixed set of species, based on environmental filtering, which attempts to reconcile the views of Clements and Gleason to predict the community composition (Clements, 1916; Hortal *et al.* 2012). However, the importance of niche-based deterministic processes has been gradually replaced by the growing realization that local communities are driven by a complex

dynamic of ecological, evolutionary and biogeographic processes that act at multiple spatial and temporal scales (Götzenberger *et al.* 2012; Zwiener *et al.* 2020). Therefore, local communities are expected to differ from S-SDMs, particularly in megadiverse tropical ecosystems, where ecological complexity is enhanced. Yet, to our knowledge, no study has compared the predictions of S-SDMs in such ecosystems, constraining our understanding of community assembly processes and limiting support to conservation and management practices.

The Atlantic Forest is considered a complex of ecosystems of great importance for biodiversity conservation (Mittermeier *et al.* 2011; Marques *et al.* 2021). It is among the largest tropical forests in the world, originally extending over more than 150 million hectares along the coast and in continental forest areas of Brazil, Argentina and Paraguay (Stehmann *et al.* 2009). Due to timber extraction, deforestation for agricultural purposes and the advance of urban areas, the original extent of the Atlantic Forest has been reduced to merely 28% (Ribeiro *et al.* 2009; Rezende *et al.* 2018). Climate change also represents a critical threat to its biodiversity and ecosystem services in this biome, which may lead to local extinctions and reorganization of plant assemblages in the near future (Inague *et al.* 2021; Zwiener *et al.* 2018). In this context, studies that compare data from local communities with estimates of S-SDMs are needed to understand the application of such models to biodiversity predictions and support decision making.

In this study we seek to compare local communities, obtained by compilation of published forest inventories studies, with estimates of bS-SDMs and cS-SDMs. More specifically we seek to answer the following questions: (a) Are the estimates and geographic patterns of species richness obtained from bS-SDMs correlated to local communities? (b) How similar are the communities in terms of species composition?

What is the relative contribution of turnover and nestedness components of β -diversity when S-SDMs are compared to local communities? We expect that the local communities and predictions of S-SDMs are different in terms of species richness and floristic composition, however, bS-SDMs are able to capture general patterns of species richness and composition. We also hypothesize a higher contribution of the nestedness component, comparing local communities to bS-SDMs, whereas, turnover is expected for comparisons with cS-SDMs, given the complexity of assembly rules in tropical forest that lead to a different set of species.

Material and methods

Study sites and species

We compiled data from 213 peer reviewed forest inventory studies that recorded data of tree species composition across the Atlantic Forest (Table S1 Supplementary information). We only considered studies that evaluated woody plant species with diameter at breast height (DBH) ≥ 4.8 cm. For each study, information on the geographic location, abundance data and a list of tree species were extracted. We verified the accuracy of the geographic coordinates in Google Earth Online (<https://earth.google.com/web/>) and readjusted it if it was incompatible with the description where the study was carried out, such as coordinates on the ocean, municipality centroids, and places with no vegetation, to the more nearby fragment or to the correct place described in the inventory. We excluded studies with lack of coordinates precision and a detailed description, low sampling (less than 200 individuals) or different sampling criteria (details in Lima *et al.* 2015; Zwiener *et al.* 2020). Studies carried out in the same location or less than five kilometres apart were grouped, resulting in a final set

of 151 localities (hereafter local communities) (Figure 1). From each study, we considered only species determined at the specific level. Each species was searched for spelling errors, incompatible homonyms, varieties and unambiguous synonyms in the “Flora do Brasil” (floradobrasil.jbrj.gov.br), and The Plant List (theplantlist.org). Family classification followed APG IV (APG 2016). We excluded species in the cases of exotic, naturalized or cultivars, and species that are not naturally found in the Atlantic Forest domain (according to “Flora do Brasil”). After taxonomic verification we end up with 2,123 species.

Occurrence records

For each species we obtained georeferenced occurrence data from SpeciesLink (<http://smlink.cria.org.br>) and GBIF - Global Biodiversity Information Facility (<https://www.gbif.org>). We excluded duplicated records, and records with less than three decimal places in the coordinates. We also excluded outliers and records that fell into the ocean. Outliers were identified when (i) coordinates fell in the centroid of the herbaria municipality where the record was stored; (ii) far outside the known distribution of the species based on expert information of state level checklists and biome occurrence provided by “Flora do Brasil” and (iii) old records dating from the 19th and early 20th century. Even though geographically isolated records may represent sink populations or species with high dispersal capacity, they may also be indicative of georeferencing errors or incorrect taxonomic identification (Boria *et al.* 2014).

To reduced potential geographical biases associated with collection data in the AF (Zwiener *et al.* 2021), we applied a spatial filtering and removed records that were less than 10 km apart from each other. The distance of 10 km was chosen based on the high

spatial heterogeneity of the AF region and resolution of environmental data used for fitting SDMs (see below). Such procedure is intended to reduce overfitting and has been shown to improve the predictions of SDMs (Boria *et al.* 2014; Varela *et al.* 2014). Considering that ecological niche estimation and model performance fitted with few occurrence records may be less accurate (Van-Proosdij *et al.* 2015), we established a minimum of 15 occurrences as a final cut-off, after the cleaning and filtering procedures, to select the species that would be modelled and compared with local communities, resulting in a final list of 1,499 species (Apêndix 1).

Environmental variables

We selected climatic and topographic variables that represent ecologically important factors associated with annual trends of temperature and precipitation, the microclimate and water accumulation in the soil.

We obtained bioclimatic variables from WorldClim v2.1 (<https://worldclim.org/>; Fick and Hijmans 2017). We also generated Aspect and Topographic Wetness Index (TWI) based on a global digital elevation model (GTOPO30; <https://earthexplorer.usgs.gov/>) in the SAGA GIS software (<http://www.saga-gis.org/>). We changed the resolutions of Aspect and TWI (30" arcsecond) to match bioclimatic layers (2.5 arcminute) using the average of nearby cells (function 'resample' from the raster package). To reduce collinearity, we selected variables based on Pearson correlation coefficient and exclude the correlated variable ($|r| \geq 0.7$) with the greater variance inflation factor, using the function 'vifcor' from the usdm package (Naimi, Groen and Skidmore 2014). The selected variables were: aspect, mean diurnal range (bio2), Isothermality (bio3) mean temperature of wettest quarter (bio 8), mean temperature of driest quarter (bio9),

precipitation of wettest month (bio13), precipitation of driest month (bio14), precipitation seasonality (bio15), precipitation of warmest quarter (bio18), precipitation of coldest quarter (bio19) and TWI.

Species distribution modelling

We have restricted the calibration and projection area of each species individually (Barve *et al.* 2011; Cooper and Soberón 2018) by (i) plotting occurrence points in geographic space, (ii) establishing a 150-km buffer around the points and (iii) considering overlapping ecoregions and potential dispersal barriers such as mountain ranges and rivers. The habitat suitability was estimated with ‘MaxEnt’ version 3.3.3 software (https://biodiversityinformatics.amnh.org/open_source/maxent/) implemented in the dismo package (Hijmans *et al.* 2020). Model settings were five bootstrap repetitions, no clamping and logistic output format, other settings were kept as default. To evaluate models, we randomly split the data into training (70%) and testing (30%) datasets. Due to lack of true absence data, we used omission error as a performance metric using the function ‘kuenm_omrat’, implemented in the R package ‘kuenm’ (<https://github.com/marloncobos/kuenm>) with default parameters (threshold = 5). We only considered models that presented error rate $\leq 5\%$ on testing data. The final models were calibrated with all occurrences and applied in the subsequent analyses. Suitability estimates were classified into binary (presence/absence) using a minimum training value threshold discarding the lowest 5% (E= 5% omission “error”, Peterson *et al.* 2011).

Community estimates

To obtain community composition and species richness predictions, we applied two SDM stacking procedures. First, by stacking binary predictions within the Atlantic Forest extent (bS-SDM). Second, by 'probability classification rule' in which the species occurrence in the community is based on the highest suitabilities constrained by the maximum number of species observed in the sites (cS-SDM) (function 'ecospat.SESAM.prr' in package ecospat using R version 4.0.2; Di Cola *et al.* 2017; R Core Team 2021). Further, we explored the effects of *a posteriori* spatial restrictions on SDMs and compared to a simple spatial delimitation of species ranges. For each species we generated a minimum convex polygon (MCP) enclosing all occurrences of the species as a simple estimate of species' distribution and used each MCP to reduce overprediction by excluding SDM suitable pixels that were not encompassed by it (Mendes *et al.* 2020). We then stacked each MCP and binary SDMs cropped by MCP (bS-SDM-CROP) to compare with local communities, bS-SDM and cS-SDM.

Community assessment and data analysis

Data on abundance of native tree species in local communities were converted to a presence/absence matrix, from which we obtained species richness and composition. The sampling effort for each locality was standardized through rarefaction and extrapolation, using the iNEXT package (iNterpolation and EXTrapolation; Chao *et al.* 2014) in R version 3.3.3.

To assess the performance of tree species community predictions, we used five commonly used metrics (Pottier *et al.* 2013; Zurell *et al.* 2020): 1) the deviation from predicted to observed species richness (SR deviation); 2) the proportion of correct predictions (prediction success); 3) the proportion of absences that were correctly

predicted (community specificity); (4) the proportion of occurrences that were correctly predicted (community sensitivity); and (5) Assembly TSS (true skill statistic). The community metrics were conducted in R version 4.0.2 using the function ‘ecospat.CommunityEval’ in ecospat package (Di Cola *et al.* 2016). To verify if there is a significant difference in the composition of the communities, a permutational multivariate analysis of variance (PERMANOVA), with 10,000 permutations, was performed and the result were illustrated with Non-Metric Multidimensional Scaling based on Jaccard dissimilarities using functions implemented in the package *vegan* from R version 4.0.2 (Oksanen *et al.* 2020).

The compositional variation between local and predicted communities (β - diversity) was obtained by calculating the compositional dissimilarity between the sites using the Jaccard Index (bjac), based on the incidence matrices of the communities. As β -diversity may be the result of species substitution (turnover) and the loss of species from location to location (nestedness) (Baselga 2010), we assess the relative contribution of these components separately. These metrics were obtained using the function ‘*beta.pair*’ in betapart package (Baselga *et al.* 2021).

To verify which species made up the absent diversity of each community, we compared the list of species present between local vs predicted communities. We consider as part of the absent diversity all species that are present in the local community, but which were not predicted in the modelled communities. We also verified the conservation status of each absent species at the IUCN database (<https://www.iucnredlist.org/>).

Furthermore, we assessed (i) the ability of S-SDMs to capture species richness patterns of local communities; and (ii) if differences in species richness are correlated with the sampling intensity of local communities. These comparisons were performed

using the Generalized Linear Model framework by comparing the predicted richness vs. observed richness, and by comparing the number of individuals observed in each local community with species richness deviation values, respectively. We used the function ‘glm’ in R version 4.0.2. (Oksanen *et al.* 2020). Due to overdispersion we used the negative binomial (link=identity) distribution, and calculated the pseudo-r² with the “rsq” package (Zhang 2021).

Results

Species richness, at local communities varied from 22 to 306 species (Fig. 2.a), with relatively higher values in the central portion of the Atlantic Forest and lower values in the extreme North and South, whereas bS-SDMs predicted values ranging from 31 to 1188 species, with similar geographical patterns (at local communities, Fig. 2.b). Such as, the bS-SDM-CROP predicted values ranging from 0 to 941 species (at local communities, Fig. 2.c). The MCP predicted values ranging from 0 to 1065 species and produced a greater pattern of richness in the central portion of the Biome than in the other portions (Fig. 2.d). Despite the different range of values, the variation in the number of species across local communities was significantly related to predictions from bS-SDMs (P-value < 0.00; pseudo-r²= 0.14; Fig. 3.a), bS-SDM-CROP (P-value < 0.000; pseudo r²= 0.19; Fig.3.b) and MCP (P-value < 0.000; pseudo r²= 0.19; Fig.3.c).

The greatest predicted richness deviation found for bS-SDM, followed by MCP and bS-SDM-CROP (Table S3. Supplementary information). When verifying whether deviations in species richness estimation could be generated by field sampling effects, the adjusted model between predicted richness deviation and the total number of recorded individuals at the local communities only for bS-SDMs this relation was significant (P

value < 0.001 ; pseudo- $r^2 = 0.019$). This relation was negative (Fig. 3.d), suggesting that as the number of individuals sampled increases, the predicted richness deviation decreases. It was not significant for bS-SDM-CROP (P value= 0.19; pseudo- $r^2 = 0.008$, Fig. 3.e) and MCP (P value=0.99; pseudo- $r^2 = 0.000$, Fig3.f).

As we expected, the predictions of species composition by S-SDMs, are not similar to the local communities. The multivariate analysis (PERMANOVA) of species composition showed a significant difference both bS-SDM ($p < 0.001$; $r^2 = 0.156$), cS-SDM ($p < 0.001$; $r^2 = 0.027$), bS-SDM-CROP ($p < 0.001$; $r^2 = 0.111$) and MCP ($p < 0.001$; $r^2 = 0.143$) when compared with the species composition of local communities. The non-similarity between the composition was evidenced in the NMDS ordination plot (dissimilarity using Jaccard's index) between pairs of local species composition vs. predicted species composition, for bS-SDM (Fig. 4.a), cS-SDM (Fig. 4.b), bS-SDM-CROP (Fig. 4.c) and MCP (Fig. 4.d).

The mean β -dissimilarity for comparisons with local communities was 0.88 for bS-SDM, 0.84 for cS-SDM, 0.85 for bS-SDM-CROP, and 0.88 for MCP (Fig. 5.a). The total partitioned dissimilarity for Jaccard indices showed that between pairs of local communities vs community from cS-SDM, the turnover component contributed more to total β -dissimilarity than the nestedness component (Fig. 5.a). In contrast, between observed communities vs bS-SDM, bS-SDM-CROP, and MCP, there was a dominance of the nestedness component over the turnover component (Fig. 5.a). The mean values of the nestedness component and turnover component were, respectively, 0.71 and 0.16 for bS-SDM, 0.60 and 0.23 for bS-SDM-CROP, and 0.74 and 0.10 for MCP. When verifying which tree species belong to the local species pool (we assume the set of species present in local communities) and which are potential colonizers in their receptive localities, they

remained absent in the forecasts of the modeled communities. We found that there are fewer absent species from MCP, bS-SDM, and bS-SDM-CROP, than in cS-SDM (Fig. 5.b). The average success of prediction for the communities was higher for cS-SDM being 0.93, followed by bS-SDM-CROP with 0.73 and MCP with 0.64, bS-SDM with 0.63 had the lowest value (Fig. 5.c). And for the average TSS, a lower value was obtained for bS-SDM being 0.11, followed by MCP with 0.12, bS-SDM-CROP 0.14 and 0.21 for cS-SDM (Fig. 5.d).

The mean overprediction for bS-SDM derived communities was 0.38, for MCP was 0.37, for bS-SDM-CROP was 0.27 and 0.04 for cS-SDM (Fig. 5.d). However, we found that there was no improvement in the underprediction effect, the mean was 0.09 for bS-SDM, for MCP 0.10, for bS-SDM-CROP 0.15 and 0.73 for cS-SDM (Fig. 5.d).

The bS-SDM, bS-SDM-CROP, MCP had true species absences (specificity) being better predicted than true species presences (sensitivity) when compared to local communities (Fig. 5.d). On average, bS-SDM showed slightly higher specificity than the others, while the opposite was observed for sensitivity. The mean sensitivity value for MCP was 0.13 and 0.15 for bS-SDM-CROP, while the average specificity value for MCP was 0.99 and 0.98 for bS-SDM-CROP. In contrast, cS-SDM-CROP recorded better accuracy in predicting true species presences (sensitivity with a mean value of 0.96) relative to true species absences (specificity with a mean value of 0.25) (Fig. 5.d). For more information about the metrics access Table S3. (Supplementary information).

Discussion

Our results showed that although the S-SDMs predictions of SR and composition differ from those observed from forest inventories, the models managed to capture part

of the variation of the natural system, which reinforces the applicability of SDMs to generate synthesis of biodiversity and inform decision-making at coarse scales. However, given the significant differences, S-SDMs should not be interpreted as estimates at local scales.

As in other studies, we evidenced that local species richness was over-predicted for modeled communities using bS-SDMs, even when SDMs are spatially constrained (bS-SDMs-CROP) (Calabrese *et al.* 2013; Guisan and Rahbek 2011; Pinto-Ledezma and Cavender-Bares 2020). Such differences can be explained by sampling effects and other non-mutually exclusive structuring processes that are not incorporated into S-SDMs. For instance, speciation, local extinction, ecological drift (Etienne and Alonso 2007), temporal dynamics (i.e., ecological succession), anthropogenic disturbances; biotic interactions (Cornell and Lawton, 1992), microhabitat variation (Grimme 1977) and dispersion limitation (Vellend, 2010). In fact, our results show that when we incorporated dispersal restrictions into SDMs predictions (bS-SDMs-CROP), the overprediction of richness was reduced. Despite overpredictions, a significant linear trend and similar spatial patterns were observed between bS-SDMs and local communities, as well as for bS-SDMs-CROP, whereas, MCPs failed to reproduce a congruent geographic pattern. The fact that the modeled communities are structured only by environmental factors and manage to reflect the general patterns of local communities, reinforces the idea that species richness in tree communities seem to be inherently linked to environmental variation across the Atlantic Forest (Eisenlohr and Oliveira-Filho 2015, Neves *et al.* 2017, Zwiener *et al.* 2020).

All modeled communities generated compositional patterns significantly different from those observed in local communities. We found that the species composition of bS-

SDMs were less dissimilar in comparison to the composition within local communities, whereas cS-SDMS returned sets of species as varied as the local communities, but did not markedly improve species composition predictions. The bS-SDMs-CROP and MCP had slightly more variation compared to the bS-SDMs. The bS-SDMs-CROP that assume environmental and dispersal filters slightly improved species composition relative to the bS-SDMs, but still failed to reproduce the species selection effects found in local communities. As in species richness, the composition of local communities is driven by multiple spatial, historical and ecological filters that lead to a complex dynamic of community assembly rules (Cornell and Lawton, 1992; Diamond 1975; Keddy 1992). In contrast, bS-SDMs and cS-SDMs communities were established only by processes structured by the environment and considering dispersal limitation in the case of bS-SDMs-CROP, which was reflected in the nestedness and turnover component of beta diversity (Baselga, 2010). Results of beta diversity partitioning suggest that communities derived from bS-SDMs, bS-SDMs-CROP and MCP can resemble a regional pool of species capable of colonizing local communities, whereas, restrictions imposed by cS-SDMS were not capable of reproducing the assembly rules of a megadiverse tropical forest. We found that most of the localities experienced a high turnover between cS-SDMs and observed communities, corroborating that environmental filtering is not the sole assembly mechanism leading to extant plant diversity in the AF (Eisenlohr and Oliveira-Filho 2015, Neves *et al.* 2017, Zwiener *et al.* 2020).

We detected a smaller number of absent species in the dataset of bS-SDMs and MCP in relation to cS-SDM and bS-SDMs-CROP, showing that bS-SDMs and MCP are more assertive in predicting presence and less in predicting absences. Meanwhile, cS-SDMs follow opposite behavior and generate larger and more varied sets of absent

species. The analysis of this set of species gives us the dimension of the worst type of error associated with SDMs, when a species that truly composes the observed species pool is not predicted (Anderson *et al.* 2003; Araújo *et al.* 2019). We also verified that part of these species was classified as threatened by extinction, being in the categories of vulnerable, endangered or critically threatened (Apêndix 1). Therefore, if the objective of a study is related to conservation or the understanding of spatial biodiversity patterns, the choice should be given to staking methods that have a smaller omission error. Furthermore, species that were predicted to occur, but were not registered in the local communities are worth studying and exploring, since they are potentially suitable for establishing a location, and could be appropriate for reintroduction and restoration of impacted environments.

S-SDMs predictions depend on the ability of individual SDMs to approximate actual distributions, however, modeling assumptions and data quality may affect such estimates. Given the large number of species considered in our study we opted for a practical approach by using the same protocols of data preparation, variables and model fitting. As such, individual species characteristics and requirements have been overlooked in favor of generality and computational efficiency, a practice largely applied in megadiverse ecological systems (Zwiener *et al.* 2017; 2018; Strassburg *et al.* 2020). Similarly, limitations associated to sampling effort, design and non-standardization can lead to uncertainties about species richness and composition of local communities and, consequently, comparisons to S-SDMs (Barry and Elith 2006). These uncertainties apparently do not invalidate S-SDMs estimates, but their abilities to reproduce the compositional and structural characteristics of local communities must be critically analyzed (Thuiller *et al.* 2015).

Conclusions

Regardless of the modeling strategy, all models generate diversity patterns that diverge from the actual patterns observed in forest inventories. Considering that "all models are wrong, but some are useful" (Box and Norman 1987), communities reconstructed with S-SDMs are expected to differ from local data, so they should be interpreted with caution. We showed that bS-SDMs may represent the potential species pool at coarse scales and may contribute to synthesize geographic patterns, but not local patterns, whereas, cS-SDMs can be interesting to approximate the regional pattern to the local one, however, we suggest the development of other ecological filters, based for example on functional diversity, phylogenetic diversity, and new metrics that characterize biotic interactions or anthropogenic impacts that act at local scales. Finally, adding spatial constraints improved the performance of SDMs by reducing overprediction. Therefore, such approach can be a suitable practice to approximate estimates of ecological communities.

Acknowledgments

We are grateful to Márcia Marques, Jaqueline de Lima Pessato and Fabiane Maziero Kupas for their help in compiling forest inventory data. This study was financed in part by the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior - Brasil (CAPES) - Finance Code 001.

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Figure legends

Figure 1: The original Atlantic Forest extent (in gray), and the geographical location of compiled forest inventories studies.

Figure 2: Geographic patterns of species richness across the Atlantic Forest. a) rarefied species richness (Observed); b) species richness derived from stacking binary SDMs (bS-SDMs), c) species richness derived from binary SDMs cropped by minimum convex polygons (bS-SDMs-CROP) and d) stacking of minimum convex polygon (MCPs).

Figure 3: Generalized linear models (GLMs) of local species richness vs. predicted species richness, sampling, and prediction errors. Legends – SR: species richness; DRP: predicted richness deviation; n° ind: total number of recorded individuals at the local communities; Black line: represents the fitted model that describes the curve. (a) Relation between SR of local communities predicted by bS-SDM in the Atlantic Forest (P-value < 0.000; pseudo-r²= 0.14), the following equation $y=407.7997+2.0795*x$. (b) Relation between SR of local communities predicted by bS-SDM-CROP in the Atlantic Forest (P-value < 0.000; pseudo r²= 0.19), the following equation $y=260.4790+1.9887*x$. (c) Relation between SR of local communities predicted by MCP in the Atlantic Forest (P-value < 0.000; pseudo r²= 0.19), the following equation $y=364.0892+2.4625*x$. (d) Relation between DRP by bS-SDM and the n° ind (P-value < 0.001; pseudo-r²= 0.019), the following equation $y=546.884986+(-0.010090)*x$. (e) Non-significant relation between DRP by bS-SDM-CROP and the n° ind. (f) Non-significant relation between DRP by MCP and the n° ind.

Figure 4: Non-metric multidimensional scale (NMDS) based on Jaccard dissimilarities (permutations = 999) between species compositions of modeled communities and communities observed in the field. (a) NMDS sorting between communities derived from binary S-SDMs (green dot symbol) and observed communities (purple triangle symbol), (k=2, stress = 0.19). b) NMDS sorting among derived communities reconstructed using

threshold species richness and probability classification (orange dot symbol) and observed communities (purple triangle symbol), ($k=2$, stress = 0.20). c) NMDS sorting among derived communities reconstructed using binary species distribution models cropped by minimum convex polygons (light pink dot symbol) and observed communities (purple triangle symbol), ($k=2$, stress = 0.19). d) NMDS sorting among derived communities reconstructed using minimum convex polygon (yellow dot symbol) and observed communities (purple triangle symbol), ($k=2$, stress = 0.19).

Figure 5: Evaluation of prediction metrics and compositional characteristics of communities modeled by: binary species distribution models cropped by minimum convex polygons (bS-SDMs-CROP), stacking binary SDMs (bS-SDM), and restricted binary with species richness and probability ranking rule (cS-SDM) and minimum convex polygon (MCP). (a) value of the overall beta diversity, measured as Jaccard dissimilarity (b.JAC), measured as the nestedness-resultant fraction of the Jaccard dissimilarity (b.JNE), the value of the turnover component, measured as the turnover fraction of Jaccard dissimilarity (b.JTU). (b) An absolute number of species are present in the local communities but are absent in the predictions of the S-SDMs. (c) prediction success or accuracy in assembly predictions (Pred.success), True skill statistics (TSS). (d) overprediction (Overp.), underprediction (Underp.), sensitivity (Sensit.), and specificity (Specif.).

Figures

Fig. 1

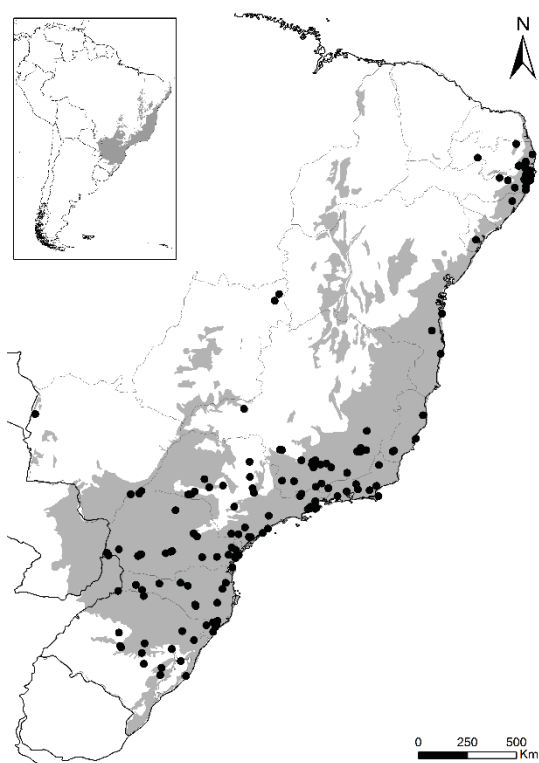


Fig. 2

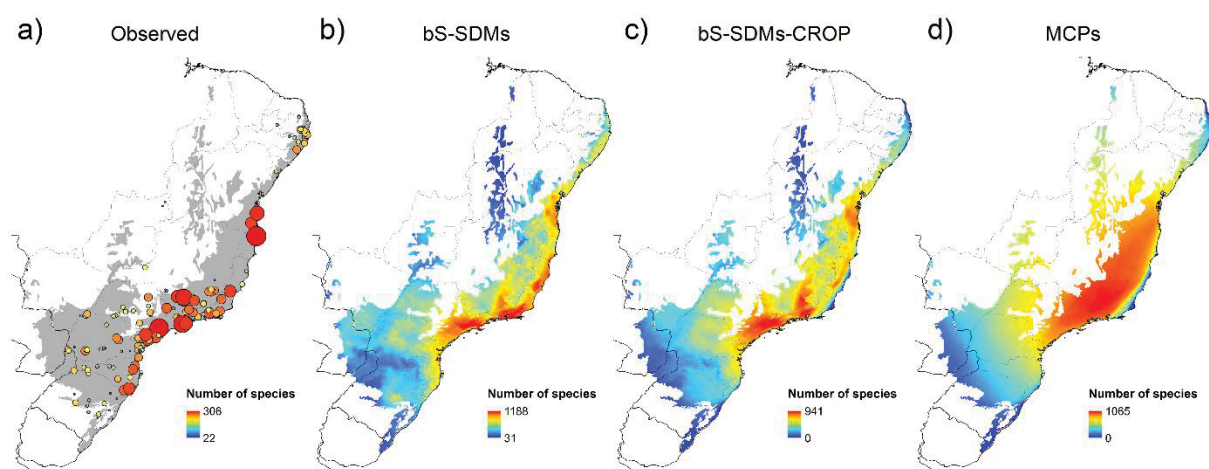


Fig. 3

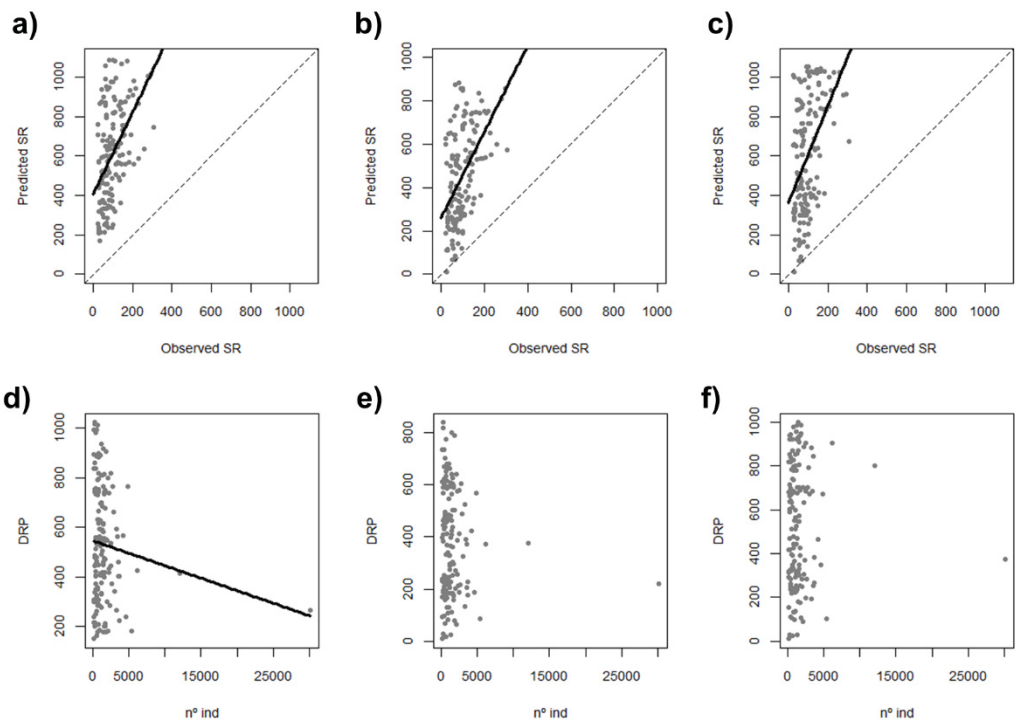


Fig. 4

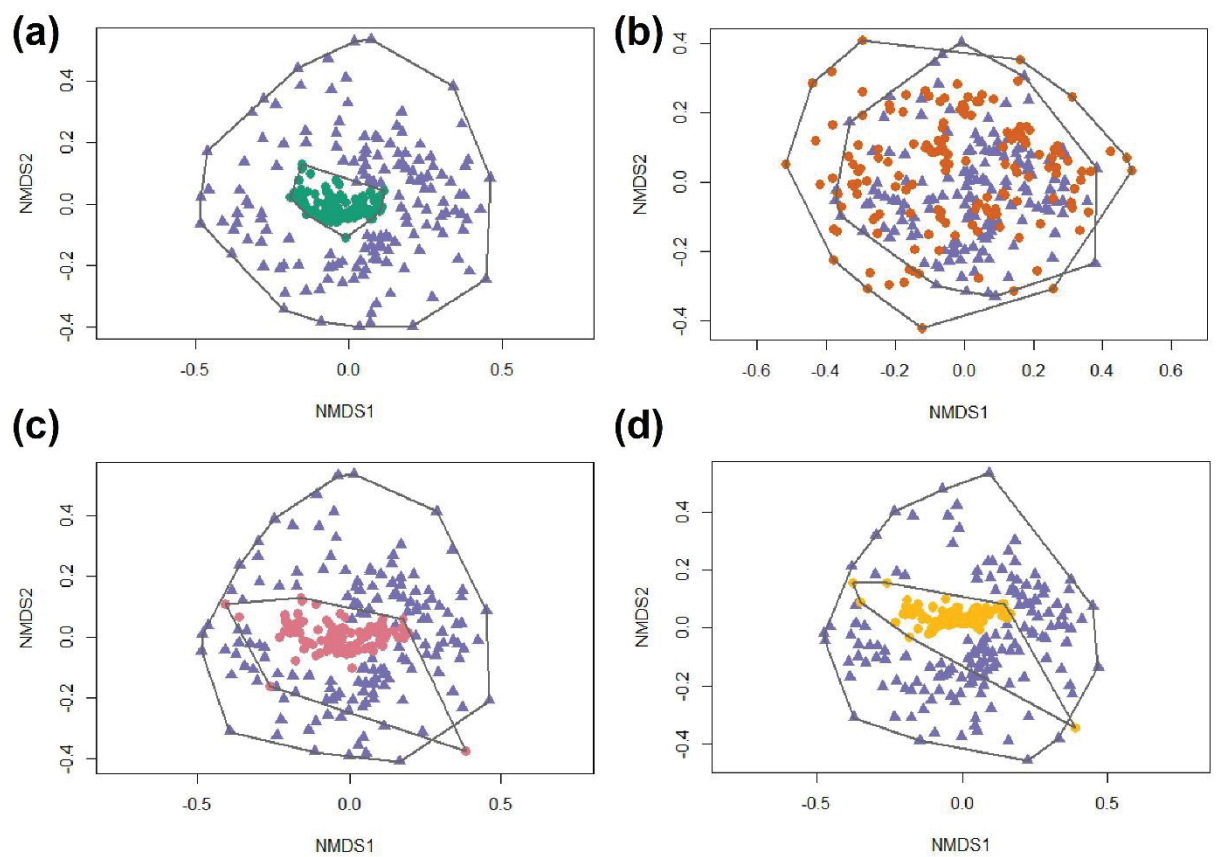
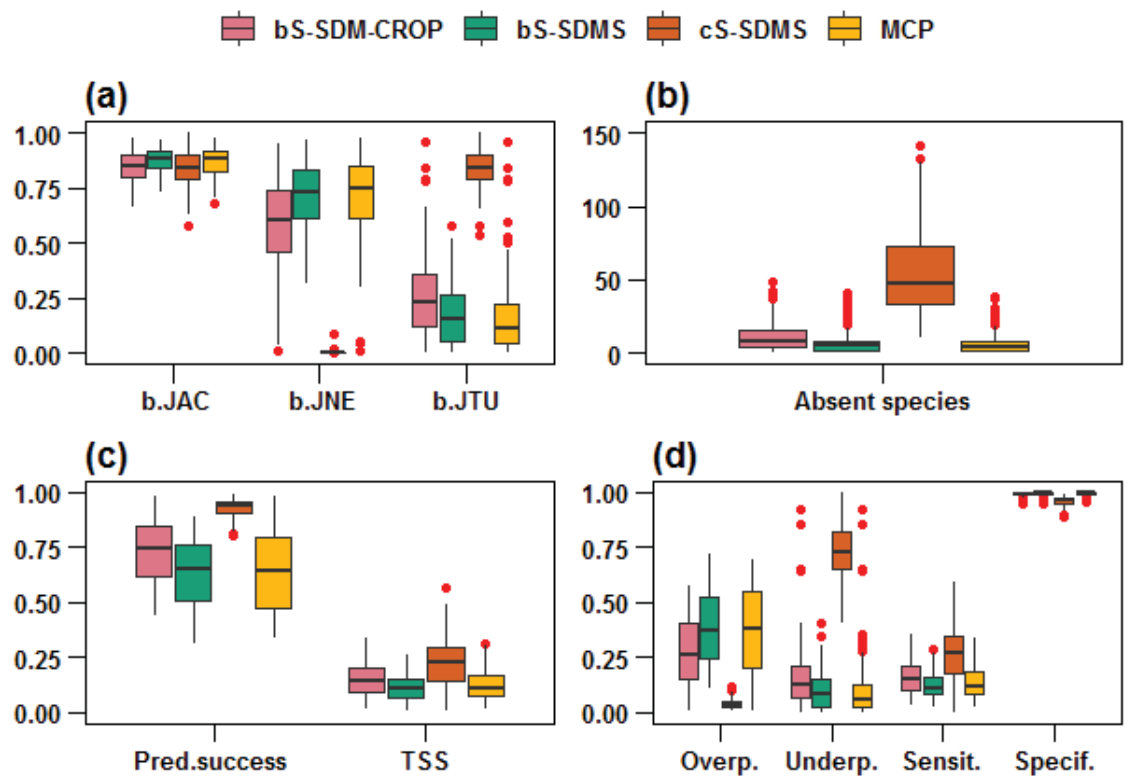
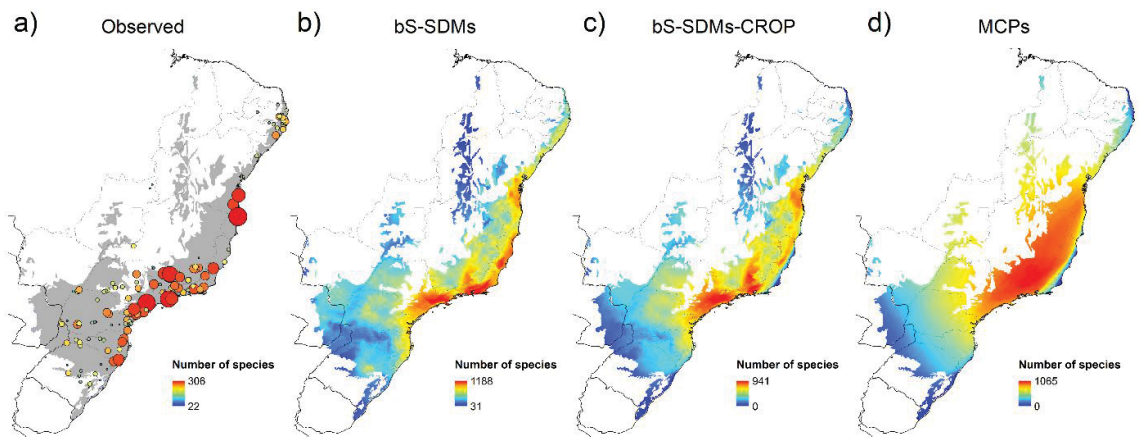


Fig.5



Graphical abstract



631 **Supplementary data**

632 **Table S1**

633 Table S1. Forest inventory studies compiled in the Atlantic Forest in increasing order of latitude (North-South). State - AL:
634 Alagoas, BA: Bahia, ES: Espírito Santo, GO: Goiás, MG: Minas Gerais, PB: Paraíba, PE: Pernambuco, PR: Paraná, RJ: Rio de
635 Janeiro, RS: Rio Grande do Sul, SC: Santa Catarina, SP: São Paulo.

Site	Reference	Longitude	Latitude	Observed	Method	Sampling area (ha)	Municipality	State
1	Medonça (2005)	35W 47' 58"	9S 15' 15"	104	plot	1.05	Murici	AL
2	Thomas et al. (2009)	39W 28' 59"	15S 12'	153	plot	1	Jussari	BA
3	Carvalho (2011)	39W 04' 58"	16S 16' 00"	225	plot	1	Porto Seguro	BA
4	Thomas et al. (2008)	39W 01' 00"	14S 25' 00"	187	transect	1	Uruçuca	BA
5	Simonelli et al. (2008)	39W 53' 24"	19S 04' 59"	55	plot	1	Linhares	ES
6	Magnago et al. (2011)	40W 13' 08"	20S 09' 40"	66	plot	0.6	Serra	ES
7	Pompeu et al. (2014)	44W 48' 55"	22S 22' 39"	74	plot	0.6	Itamonte	MG
8	Fagundes et al. (2007)	46W 27'	20S 40' 00"	43	plot	0.52	Passos	MG
9	Fagundes et al. (2007)	46W 22' 00"	20S 40' 59"	34	plot	0.48	Alpinópolis	MG
10	Barbosa (1996)	34W 52' 00"	7S 06'	49	plot	1	João Pessoa	PB

11	Nascimento (2001)	36W 22' 58"	8S 10' 59"	43	plot	1	Brejo da Madre de Deus	PE
12	Siqueira (1997)	34W 58' 00"	8S 18'	58	plot	1	Cabo de Santo Agostinho	PE
13	Silva Jr (2004)	35W 04' 15"	8S 13' 00"	85	plot	1	Cabo de Santo Agostinho	PE
14	Tavares (1998)	36W 00'	8S 18'	50	plot	1	Caruaru	PE
15	Costa Jr et al. (2007)	35W 40' 30"	8S 37' 50"	69	plot	1	Catende	PE
16	Rocha (2007)	34W 59' 26"	7S 50' 10"	76	plot	1	Igarassu	PE
17	Vitória (2009)	35W 10' 30"	7S 30' 12"	24	plot	0.5	Itambé	PE
18	Vitória (2009)	35W 11' 31"	7S 25' 54"	29	plot	0.5	Itambé	PE
19	Ferraz e Rodal (2006)	35W 30'	7S 37' 59"	101	plot	1	São Vicente Férrer	PE
20	Silva (2009)	35W 10' 01"	8S 34' 00"	78	plot	1.5	Sirinhaém	PE
21	Teixeira (2009)	35W 11' 06"	8S 44' 11"	67	plot	1.05	Tamandaré	PE
22	Liebsch et al. (2007); Borgo et al. (2011)	48W 40' 14"	25S 09' 20"	82	plot	0.4	Antonina	PR
23	Zacarias (2008)	48W 28' 27"	25S 16' 39"	52	plot	0.16	Guaraqueçaba	PR
24	Silva et al. (1993)	48W 20' 35"	25S 30' 50"	49	plot	0.56	Paranaguá	PR
25	Silva (1994)	48W 49' 00"	25S 30'	54	pc-quarter	0.13	Morretes	PR
26	Almeida e Bonati (2015)	48W 29' 40"	25S 38' 55"	40	plot	0.1	Pontal do Parana	PR

27	Rotta et al. (1997)	48W 31' 58"	25S 34' 59"	28	plot	0.28	Paranaguá	PR
28	Kurtz e Araújo (2000)	42W 52' 59"	22S 28' 59"	112	pc-quarter	0.44	C. de Macacu	RJ
29	Gandra et al. (2011)	43W 49' 01"	22S 48'	76	plot	0.5	Itaguaí	RJ
30	Cruz et al. (2013)	42W 58' 00"	22S 15'	69	plot	1	Macaé	RJ
31	Cruz et al. (2013)	42W 01' 59"	22S 19' 59"	81	plot	0.5	Macaé	RJ
32	Sobrinho et al. (2008)	43W 24'	22S 34' 59"	42	plot	0.2	Nova Iguaçu	RJ
33	Christo et al. (2009)	42W 20' 46"	22S 31' 56"	95	plot	0.5	Silva Jardim	RJ
34	Jurinitz e Jarenkow (2003)	51W 52' 59"	30S 40' 59"	62	plot	1	Camaquã	RS
35	Dorneles e Waechter (2004)	50W 46' 00"	31S 04' 00"	21	pc-quarter	-	Tavares	RS
36	Scherer et al. (2005)	51W 00' 30"	30S 22' 32"	28	plot	1.02	Viamão	SC
37	Martins (2010)	49W 31' 00"	29S 01' 59"	25	plot	1	Araranguá	SC
38	Silva (2006)	49W 25' 00"	28S 48'	123	plot	1	Criciúma	SC
39	Unesc (2009)	49W 21' 30"	28S 41' 16"	79	pc-quarter	-	Criciúma	SC
40	Iza (2002)	48W 56' 28"	26S 46' 59"	128	plot	1	Ilhota	SC
41	Negrelle (2006)	48W 37' 59"	26S 04' 00"	117	plot	1	Itapoá	SC
42	Colonetti (2008)	49W 18' 53"	28S 31' 55"	100	plot	1	Siderópolis	SC
43	Pasetto (2008)	49W 31' 06"	28S 35' 32"	91	plot	1	Siderópolis	SC
44	Martins (2010)	49W 49' 59"	28S 43' 59"	133	plot	1	Timbé do Sul	SC

45	Cardoso-Leite et al. (2013)	48W 21'	24S 33'	124	plot	0.8	Barra do Turvo	SP
46	Catharino et al. (2006)	46W 58' 17"	23S 42' 15"	218	pc-quarter	-	Cotia	SP
47	Melo et al. (2000)	47W 15'	24S 30'	146	plot	1	Peruíbe	SP
48	Aidar et al. (2001)	48W 41' 09"	24S 31' 43"	82	plot	0.3	Iporanga	SP
49	Ivanauskas (1997)	47W 52' 37"	24S 40' 33"	152	plot	1.21	Parquera-Açu	SP
50	Sztutman e Rodrigues (2002)	47W 48'	24S 40' 00"	96	plot	0.54	Parquera-Açu	SP
51	Oliveira et al. (2001)	47W 00' 30"	24S 17' 35"	42	plot	0.2	Peruíbe	SP
52	Gomes et al. (2004)	45W 31' 59"	22S 48'	62	plot	0.25	Pindamonhangaba	SP
53	Padgurschi et al. (2011)	45W 03'	23S 16' 59"	136	plot	1	São Luiz do Paraitinga	SP
54	Padgurschi et al. (2011)	45W 10' 59"	23S 24'	109	plot	1	São Luiz do Paraitinga	SP
55	Guilherme et al. (2004)	48W 04' 00"	24S 13' 59"	152	plot	-	Sete Barras	SP
56	Cesar e Monteiro (1995)	44W 50' 24"	23S 22' 54"	40	plot	0.52	Picinguaba	SP
57	Campos et al. (2011)	44W 49' 56"	23S 02' 03"	124	plot	1	Ubatuba	SP
58	Loures et al. (2007)	46W 21' 20"	22S 05' 44"	94	plot	1	Santa Rita de Caldas	MG

59	Carvalho et al. (2009)	49W 20' 54"	25S 35' 12"	22	plot	0.2	Santa Rita de Caldas	MG
60	Oliveira-Lima (2012)	51W 23' 55"	25S 19' 30"	35	plot	0.66	Guarapuava	PR
61	Cordeiro e Rodrigues (2007)	51W 28' 08"	25S 21' 06"	37	plot	0.32	Guarapuava	PR
62	Iurk (2008)	50W 01' 34"	25S 36' 12"	33	plot	2.5	Palmeira	PR
63	Carmo e Assis (2012)	50W 15' 25"	24S 39' 10"	94	plot	0.5	Tibagi	PR
64	Dias et al. (1998)	50W 25' 00"	24S 31' 00"	105	plot	1	Tibagi	PR
65	Rondon Neto et al. (2002)	50W 56' 08"	29S 00' 05"	34	plot	0.8	Criúva	RS
66	Giongo e Waechter (2007)	52W 42'	30S 30'	38	plot	0.3	Encruzilhada do Sul	RS
67	Leyser et al. (2009)	52W 42' 35"	27S 23' 38"	70	plot	1	Faxinalzinho	RS
68	Sonego et al. (2007)	50W 24'	29S 25' 00"	31	plot	0.29	São Francisco de Paula	RS
69	Silva et al. (2013)	49W 20' 01"	27S 42' 01"	80	plot	0.4	Alfredo Wagner	SC
70	Negrelle e Silva (1992)	51W 01' 00"	26S 46' 59"	41	plot	-	Caçador	SC
71	Klauberger et al. (2010)	50W 21'	27S 46' 59"	43	plot	0.64	Lages	SC
72	Teo et al. (2012)	50W 40' 58"	26S 55' 00"	49	plot	1	Lebon Régis	SC
73	Floss (2011)	51W 59' 24"	26S 49' 18"	53	plot	1.56	Ponte Serrada	SC
74	Ribeiro et al. (2013)	44W 13' 59"	22S 25' 59"	104	plot	0.86	Bananal	SP

75	Souza et al. (2012)	45W 27' 52"	22S 41' 30"	23	plot	1	Campos do Jordão	SP
76	Abreu et al. (2013)	41W 16' 59"	20S 45'	51	plot	2.4	Cachoeiro de Itapemirim	ES
77	Archanjo et al. (2012)	41W 13' 00"	20S 43' 00"	162	plot	2.5	Cachoeiro de Itapemirim	ES
78	Silva e Scariot (2003)	46W 41' 55"	13S 49' 34"	24	plot	1	São Domingos	GO
79	Silva e Scariot (2004)	46W 29' 48"	13S 31' 11"	35	plot	1	São Domingos	GO
80	Soares (2005)	42W 29' 47"	20S 41' 24"	110	pc-quarter	0.34	Araponga	MG
81	Rocha et al. (2005)	45W 28' 17"	21S 09' 19"	144	plot	1	Coqueiral	MG
82	Camargos et al. (2008)	42W 28' 18"	19S 48' 18"	26	plot	1	Dionísio Marliéria e Timóteo	MG
83	Silva et al. (2003)	44W 49' 59"	21S 09'	104	plot	1.04	Ibituruna	MG
84	Botrel et al. (2002)	44W 55' 00"	21S 24'	126	plot	1	Ingai	MG
85	Van den Berg & Oliveira-Filho (2000)	44W 36'	21S 21'	99	plot	0.84	Itutinga	MG
86	Fonseca e Carvalho 2012	43W 22' 21"	21S 43' 49"	58	plot	1	Juiz de Fora	MG
87	Brito e Carvalho 2014	43W 22' 25"	21S 43' 59"	72	plot	1	Juiz de Fora	MG
88	Souza et al. (2003)	44W 19' 59"	21S 18'	124	plot	1.12	Lavras	MG
89	Dalanesi et al. (2004)	44W 59' 21"	21S 20' 47"	184	plot	2.4	Lavras	MG
90	Rodrigues et al. (2002)	44W 55' 00"	21S 28' 59"	144	plot	1.28	Luminárias	MG

91	Silva et al. (2009)	45W 48' 29"	22S 06' 40"	46	plot	1.08	São Sebastião da Bela Vista	MG
92	Ferreira Jr. (2005)	42W 45' 53"	20S 45' 14"	109	plot	1	Viçosa	MG
93	Santos (2005)	42W 55' 00"	20S 45'	111	plot	0.5	Viçosa	MG
94	Paula et al. (2004)	42W 45'	20S 34' 59"	87	plot	1	Viçosa	MG
95	Lima et al. (2010)	57W 40' 57"	19S 01' 38"	21	pc-quarter	-	Corumbá	MS
96	Campos et al. (2000)	53W 18'	22S 43' 00"	38	plot/transect	0.54	Rio Paraná	PR
97	Cunha et al. (2013)	37W 23' 12"	7S 15' 19"	44	plot	1.8	Entre Mão Dágua e Maturéia	PB
98	Lopes (2007)	35W 13' 59"	7S 37' 59"	56	plot	1	Aliança	PE
99	Costa Filho et al. (2006)	52W 55' 00"	22S 40' 59"	89	plot	1.5	Diamante do Norte	PR
100	Del Quiqui et al. (2007)	52W 49' 00"	22S 34' 00"	95	plot	4.35	Diamante do Norte	PR
101	Bianchini et al. (2003)	51W 15'	23S 27'	57	plot	0.5	Londrina	PR
102	Viani et al. (2011)	52W 58' 00"	25S 33'	60	pc-quarter	0.61	Quedas do Iguaçu	PR
103	Viani et al. (2011)	52W 52' 59"	25S 28' 59"	69	pc-quarter	0.52	Quedas do Iguaçu	PR
104	Viani et al. (2011)	52W 49' 00"	25S 28' 00"	55	pc-quarter	0.5	Quedas do Iguaçu	PR
105	Gris (2012)	54W 23' 42"	25S 24' 13"	56	plot	0.36	Santa Terezinha do Itaipu	PR
106	Gris (2012)	54W 20' 07"	25S 29' 32"	63	plot	0.36	Santa Terezinha do Itaipu	PR

107	Gris (2012)	54W 21' 23"	25S 27' 28"	45	plot	0.36	Santa Terezinha do Itaipu	PR
							Cabo Frio e Armação dos Búzios	RJ
108	Kunz et al. (2009)	41W 56' 07"	22S 48' 26"	40	plot	0.5		
109	Dan et al. (2010)	41W 55' 05"	21S 22' 32"	116	plot	0.2	São José de Ubá	RJ
110	Giehl & Jarenkow (2008)	53W 52' 59"	27S 09'	75	plot	1	Derrubadas	RS
	Lindenmaier & Budke							
111	(2006)	52W 48'	30S 00'	46	plot	1	Cachoeira do Sul	RS
112	Longhi et al. (2008)	51W 25' 12"	29S 49' 07"	69	plot	1.83	Montenegro	RS
113	Longhi et al. (1999)	53W 46' 58"	29S 40' 59"	51	plot	0.36	Santa Maria	RS
114	Budke et al. (2005)	53W 45'	29S 45'	53	plot	1	Santa Maria	RS
115	Rosa et al. (2008)	53W 50' 45"	29S 04' 04"	22	plot	0.2	Tupanciretã	RS
	Jarenkow e Waechter							
116	(2001)	52W 40' 00"	29S 34' 00"	47	plot	1	Vale do Sol	RS
117	Floss (2011)	53W 03' 57"	26S 52' 33"	70	plot	1.56	Guatambu	SC
118	Floss (2011)	52W 47' 05"	27S 06' 28"	79	plot	1.56	Saudades	SC
119	Oliveira et al. (2012)	37W 28' 05"	11S 01' 50"	63	circular plot	0.79	Salgado	SE
	Toniato e Oliveira-Filho							
120	(2004)	49W 04' 00"	22S 19' 00"	66	plot	1.6	Bauru	SP

121	Durigan et al. (2000)	49W 42'	22S 24'	55	plot	0.6	Gália	SP
122	Ivanauskas et al. (1999)	48W 33'	23S 16' 59"	76	plot	0.42	Itatinga	SP
123	Durigan (1994)	50W 22' 00"	22S 34' 59"	49	plot	0.3	Assis	SP
124	Durigan (1994)	49W 55' 00"	22S 01' 00"	61	plot	0.3	Marília	SP
125	Durigan (1994)	50W 31' 00"	22S 42'	60	plot	0.3	Tarumã	SP
126	Durigan (1994)	50W 40' 00"	22S 43' 59"	58	plot	0.3	Tarumã	SP
127	Nascimento et al. (1999)	47W 39'	22S 39'	50	transect	0.5805	Piracicaba	SP
128	Tanaka (2009)	47W 50' 53"	21S 13' 20"	115	pc-quarter	1.08	Ribeirão Preto	SP
129	Bertani et al. (2001)	47W 43' 05"	22S 26' 08"	90	plot	0.785	Ipeúna	SP
130	Silva e Soares (2002)	47W 50' 04"	21S 55' 25"	63	plot	1	São Carlos	SP
131	Souza et al. (2017)	53W 50' 44"	25S 14' 40"	13	plot	4.2	Foz do Iguaçu	PR
132	Souza et al. (2017)	53W 50' 45"	25S 14' 36"	20	plot	4.2	Foz do Iguaçu	PR
133	Cordeiro et al. (2019)	51W 41' 45"	25S 25' 18"	43	plot	0.8	Guarapuava	PR
134	Silva et al. (2012)	50W 19' 04"	27S 51' 02"	64	plot	1	Lages	SC
135*	Bosa (2011); Santos (2003); Martins (2005)	49W 24' 02"	28S 34' 32"	160	pc-quarter/plot	1.5	Siderópolis	SC
136*	Schorn (2005); Schorn e Galvão (2009); Caglioni (2013)	49W 05' 34"	27S 03' 51"	142	plot	0.72	Blumenau	SC

137*	Gris (2012)	54W 19' 08"	25S 31' 41"	75	plot	1.93	Santa Terezinha do Itaipu	PR
	Gomes et al. (2011);							
	Rochelle et al. (2011);							
138*	Gomes et al. (2011)	45W 05' 10"	23S 22' 05"	250	plot	0.72	Ubatuba	SP
139*	Pereira et al. (2005)	44W 32' 56"	22S 13' 03"	144	plot	3	Bocaina de Minas	MG
	Silva e Oliveira-Filho							
	(2003); Machado et al.							
	(2004); Nunes et al.							
140*	(2003)	44W 57' 58"	21S 13' 30"	225				
141*	Siqueira et al. (2009)	48W 06' 30"	18S 47' 30"	66	plot	12	Uberlandia	MG
	Feitosa (2004); Alves							
	Junior et al. (2006); Souza							
142*	Jr (2006)	34W 56' 28"	8S 04' 46"	86	plot	2.5	Recife	PE
	Oliveira (2011); Andrade							
143*	e Rodal (2004)	35W 10' 26"	8S 02' 44"	72	plot	1.37	São Lourenço da Mata	PE
	Holanda (2008); Oliveira							
144*	(2006)	35W 12' 11"	7S 44' 03"	89	plot	1.52	Nazaré da Mata	PE
145*	Xavier (2009)	35W 37' 18"	6S 37' 48"	43	pc-quarter	0.72	Dona Inês	PB

De Marchi e Jarenkow									
(2008); De Marchi e									
146*	Jarenkow (2008)	51W 56' 42"	31S 01' 01"	26	plot	2	Cristal	RS	
Negrini et al. (2014);									
147*	Guidini et al. (2014)	50W 19' 30"	27S 48' 58"	93	plot/transect	9.2	Lajes	SC	
Assis et al. (2011a); Assis									
148*	et al. (2011b)	44W 46' 51"	23S 20' 22"	170	plot	2	Ubatuba	SP	
Carvalho et al. (2007);									
149*	Carvalho et al. (2007)	44W 06' 04"	21S 29' 03"	164	plot	2.4	Piedade do Rio Grande	MG	
Lopes (2007); Lopes									
150*	(2007)	35W 28' 00"	7S 37' 00"	81	plot	2	São Vicente Férrer	PE	
Oliveira (2011); de									
151*	Oliveira et al. (2012)	35W 14' 41"	8S 15' 20"	48	plot	0.74	Juçaral	PE	

*Localities with mean coordinates and combined species occurrences.

643 **Table S2**

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Table S2 – Summary with mean, standard deviation (SD), maximum (max), minimum (min) of the evaluated metrics. Types of communities: bS-SDMs - stacking binary species distribution models, cS-SDMs - binary species distribution models restricted by the observed species richness, bS-SDMs-CROP - binary species distribution models cropped by minimum convex polygons, and MCP minimum convex polygons. Metrics: TSS-True Skill Statistic.

communities	Species richness	predicted richness deviation	β -dissimilarity	β -turnover	β -nestedness	absent species	success of prediction	TSS	over prediction	under prediction	specificity	sensitivity
bS-SDMs	mean	608	0.88	0.16	0.71	7.25	0.63	0.11	0.38	0.09	0.99	0.12
	SD	242	0.05	0.12	0.14	8.03	0.15	0.05	0.16	0.08	0	0.05
	max	1088	0.97	0.57	0.96	41	0.89	0.26	0.72	0.41	1	0.28
	min	172	0.73	0	0.31	0	0.31	0	0.1	0	0.94	0.02
cS-SDMs	mean	-	0.84	0.84	0	47	0.93	0.21	0.04	0.73	0.25	0.96
	SD	-	0.07	0.08	0	27.36	0.03	0.11	0.02	0.12	0.11	0.02
	max	-	1	1	0.09	142	0.98	0.56	0.12	1	0.59	0.99
	min	-	0.58	0.53	0	10	0.8	0.02	0.01	0.41	0	0.88
bS-SDM-CROPs	mean	456	0.85	0.23	0.6	11.48	0.73	0.14	0.27	0.15	0.98	0.15
	SD	217	0.06	0.17	0.19	10.29	0.13	0.07	0.14	0.14	0.01	0.07
	max	1882	0.97	0.95	0.96	49	0.98	0.33	0.57	0.92	1	0.35
	min	11	0.66	0.01	0	0	0.44	0.01	0	0	0.94	0.03

MCPs	mean	602	514	0.88	0.1	0.74	6.86	0.64	0.12	0.37	0.1	0.99	0.13
	SD	294	227	0.06	0.17	0.19	7.83	0.18	0.06	0.19	0.13	0	0.06
	max	1056	998	0.97	0.96	0.97	38	0.98	0.31	0.69	0.92	1	0.33
	min	11	10	0.68	0	0.01	0	0.33	0.01	0	0	0.95	0.02
local communities	mean	97	-	-	-	-	-	-	-	-	-	-	-
	SD	57	-	-	-	-	-	-	-	-	-	-	-
	max	306	-	-	-	-	-	-	-	-	-	-	-
	min	22	-	-	-	-	-	-	-	-	-	-	-
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CONCLUSÃO GERAL

Neste estudo apontamos a capacidade dos modelos de nicho e distribuição geográfica em produzir previsões em nível de comunidade, especialmente, gerar previsões de riqueza e composição de espécie para um *hotspot* de biodiversidade, a Mata Atlântica brasileira. Como esperávamos, nossos resultados mostraram que todas as estratégias utilizadas por nós para reconstruir as comunidades geraram padrões de diversidade diferentes dos padrões observados nos inventários florestais. Possivelmente em virtude de vieses associados a amostragem dos dados, ao processo de modelagem da comunidade e as comparações entre os tipos de comunidades. Como também, em virtude da natureza dos dados dos inventários de campo, que representam comunidades locais resultantes de uma complexa dinâmica de regras de montagem comunitária, o que não ocorre nas comunidades modeladas. Visto que os modelos provavelmente deixaram de incorporar em suas previsões, fatores importantes que norteiam a ocorrência das espécies. Apesar dessas diferenças, vimos que os S-SDMs acompanharam os padrões gerais de riqueza de espécies encontrados nos inventários florestais e podem representar um conjunto potencial de espécies em escalas regionais. Entretanto, os bS-SDMS e bS-SDMS-CROP aparentemente não devem ser interpretados em escalas locais.

Ainda, nossos resultados mostraram que as restrições impostas nos cS-SDMS por meio da riqueza de espécies e pela regra de classificação de probabilidade, não foram capazes de reproduzir as regras de montagem de uma floresta tropical megadiversa. Sobretudo, os cS-SDMS não conseguiram melhorar drasticamente as previsões de composição de espécies da comunidade. Mas, eles demonstraram que podem ser úteis para aproximar o padrão de diversidade regional do local e sugerimos agregar novos filtros ecológicos e geográficos a estratégia. Vimos também que agregar ao empilhamento binário restrições simples no espaço geográfico, usando os MCPs como filtros de dispersão hipotético, pode reduzir o excesso de previsão e melhorar ligeiramente o desempenho das previsões dos modelos. Todavia, usar

somente a estratégia de MCPs não parece melhorar as previsões da comunidade em comparação com SDMs.

Por fim, ressaltamos que para implementar uma abordagem abrangente em decorrência do volume de dados, tivemos que fazer suposições que adicionaram incerteza aos resultados. Mas ainda assim, as limitações aparentemente não invalidam as estimativas dos S-SDMs, que mostram ser capazes de capturar parte das variações das comunidades locais e podem endossar a síntese da biodiversidade e o planejamento da conservação em escalas grosseiras. Especialmente, acreditamos que os S-SDMs podem ser aplicáveis em florestas tropicais ameaçadas, visto que atualmente sofrem intensamente com a fragmentação e as mudanças climáticas, sendo necessário mitigar tais efeitos sobre os habitats e a biodiversidade. Contudo, reforçamos que suas capacidades em reproduzir as características composicionais e estruturais das comunidades locais devem ser analisadas criticamente.

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ANEXO

Anexo 1

Anexo 1. List of arboreal species naturally occurring in the Brazilian Atlantic Forest. Conservation status is based on the IUCN Red List of Threatened Species. The absent species correspond to species that were not predicted to compose the communities generated by stacking binary species distribution models (bS-SDMs), binary species distribution models restricted by the observed species richness (cS-SDMs), binary species distribution models cropped by minimum convex polygons (bS-SDMs-CROP), and minimum convex polygons (MCP).

ILY	SCIENTIFIC NAME	ABSENT SPECIES			CONSERVATION	
		bS-SDMs	cS-SDMs	bS-SDMs-CROP	MCP	STATUS
Achariaceae	<i>Carpotroche brasiliensis</i> (Raddi)					
	A Gray		+	+	+	Not Evaluated
Achatocarpaceae	<i>Achatocarpus praecox</i> Griseb.		+	+		Least Concern
Adoxaceae	<i>Sambucus australis</i> Cham. &					
	Schltl					Not Evaluated
Anacardiaceae	<i>Anacardium occidentale</i> L.					Not Evaluated

<i>Astronium concinnum</i> Schott				+	+	+	Not Evaluated
<i>Astronium fraxinifolium</i> Schott	+		+		+	+	Least Concern
<i>Astronium graveolens</i> Jacq.	+		+		+	+	Least Concern
<i>Astronium urundeuva</i> (M.Allemão) Engl.	+		+		+		Not Evaluated
<i>Lithraea brasiliensis</i> Marchand			+				Not Evaluated
<i>Schinus molle</i> L.	+		+		+	+	Not Evaluated
<i>Schinus terebinthifolia</i> Raddi	+		+		+		Not Evaluated
<i>Spondias mombin</i> L.	+		+		+	+	Not Evaluated
<i>Spondias venulosa</i> (Mart. ex Engl.) Engl.					+		Not Evaluated
<i>Tapirira guianensis</i> Aubl.			+		+		Not Evaluated
<i>Tapirira obtusa</i> (Benth.) J.D.Mitch.			+				Not Evaluated
<i>Thyrsodium spruceanum</i> Benth.			+		+	+	Not Evaluated
<i>Anaxagorea dolichocarpa</i> Sprague & Sandwith							
<i>Annona acutiflora</i> Mart.	+		+		+		Not Evaluated
<i>Annona bahiensis</i> (Maas & Westra) H.Rainer							
<i>Annona cacans</i> Warm.	+		+		+	+	Least Concern

<i>Annona crassiflora</i> Mart.	+	+	+	+	Not Evaluated
<i>Annona dolabripetala</i> Raddi	+	+	+	+	Not Evaluated
<i>Annona emarginata</i> (Schltdl.) H.Rainer	+	+	+		Least Concern
<i>Annona glabra</i> L.		+	+		Least Concern
<i>Annona montana</i> Macfad.					Not Evaluated
<i>Annona mucosa</i> Jacq.		+			Not Evaluated
<i>Annona pickelii</i> (Diels) H.Rainer		+	+	+	Vulnerable
<i>Annona salzmännii</i> A.DC.		+	+	+	Not Evaluated
<i>Annona sylvatica</i> A.St.-Hil.		+	+	+	Not Evaluated
<i>Cymbopetalum brasiliense</i> (Vell.) Benth. ex Baill.	+	+	+		Least Concern
<i>Duguetia bahiensis</i> Maas		+			Not Evaluated
<i>Duguetia flagellaris</i> Huber	+	+	+	+	Not Evaluated
<i>Duguetia gardneriana</i> Mart.		+			Not Evaluated
<i>Duguetia lanceolata</i> A.St.-Hil.		+			Least Concern
<i>Guatteria australis</i> A.St.-Hil.	+	+	+		Least Concern
<i>Guatteria campestris</i> R.E.Fr.					Least Concern
<i>Guatteria candolleana</i> Schltdl.			+		Not Evaluated
<i>Guatteria oligocarpa</i> Mart.					Not Evaluated
<i>Guatteria pogonopus</i> Mart.		+			Not Evaluated

<i>Guatteria pohliana</i> Schltdl.	+				Near Threatened
<i>Guatteria schomburgkiana</i> Mart.	+	+		+	Not Evaluated
<i>Guatteria sellowiana</i> Schltdl.	+				Least Concern
<i>Guatteria villosissima</i> A.St.-Hil.	+	+		+	Least Concern
<i>Oxandra espiptana</i> (Spruce ex Benth.) Baill.	+	+		+	Not Evaluated
<i>Porcelia macrocarpa</i> (Warm.) R.E.Fr.	+				Not Evaluated
<i>Pseudoxandra bahiensis</i> Maas	+	+		+	Not Evaluated
<i>Unonopsis bahiensis</i> Maas & Orava	+				Not Evaluated
<i>Unonopsis guatterioides</i> (A.DC.) R.E.Fr.					Not Evaluated
<i>Xylopia brasiliensis</i> Spreng.	+	+			Near Threatened
<i>Xylopia frutescens</i> Aubl.	+	+		+	Not Evaluated
<i>Xylopia laevigata</i> (Mart.) R.E.Fr.	+				Not Evaluated
<i>Xylopia ochrantha</i> Mart.	+			+	Not Evaluated
<i>Xylopia sericea</i> A.St.-Hil.	+				Not Evaluated
<i>Aspidosperma cuspa</i> (Kunth) S.F.Blake	+				Not Evaluated

Apocynaceae

<i>Aspidosperma cylindrocarpon</i> Müll.Arg.	+					Least Concern
<i>Aspidosperma desmanthum</i> Benth. ex Müll.Arg.	+			+		+
<i>Aspidosperma discolor</i> A.DC.	+		+	+		Not Evaluated
<i>Aspidosperma dispernum</i> Müll.Arg.	+	+	+	+		Not Evaluated
<i>Aspidosperma illustre</i> (Vell.) Kuhl. & Pirajá	+			+		+
<i>Aspidosperma oblongum</i> A.DC.	+		+	+		Not Evaluated
<i>Aspidosperma parvifolium</i> A.DC.	+		+	+		Not Evaluated
<i>Aspidosperma polyneuron</i> Müll.Arg.	+		+	+		Near Threatened
<i>Aspidosperma pyricollum</i> Müll.Arg.	+		+	+		Not Evaluated
<i>Aspidosperma quirandy</i> Hassl.	+	+	+	+		Not Evaluated
<i>Aspidosperma ramiflorum</i> Müll.Arg.	+					Least Concern
<i>Aspidosperma subincanum</i> Mart.	+					Not Evaluated
<i>Geissospermum laeve</i> (Vell.) Miers	+		+	+		Not Evaluated

<i>Himatanthus bracteatus</i> (A. DC.) Woodson									Not Evaluated
<i>Himatanthus obovatus</i> (Müll. Arg.) Woodson									
<i>Macoubea guianensis</i> Aubl.								+	Not Evaluated
<i>Malouetia cestroides</i> (Nees ex Mart.) Müll.Arg.								+	
<i>Rauvolfia bahiensis</i> A.DC.								+	Least Concern
<i>Rauvolfia grandiflora</i> Mart. ex A.DC.								+	Not Evaluated
<i>Rauvolfia sellowii</i> Müll.Arg.									Not Evaluated
<i>Tabernaemontana catharinensis</i> A.DC.									Not Evaluated
<i>Tabernaemontana flavicans</i> Willd. ex Roem. & Schult.								+	Not Evaluated
<i>Tabernaemontana hystrix</i> Steud.								+	Not Evaluated
<i>Tabernaemontana laeta</i> Mart.								+	Not Evaluated
<i>Tabernaemontana salzmännii</i> A.DC.								+	Not Evaluated
<i>Aptandra tubicina</i> (Poepp.) Benth. ex Miers									Not Evaluated

Aptandraceae

	<i>Cathedra rubricaulis</i> Miers	+	+	+	Not Evaluated
Aquifoliaceae	<i>Ilex brasiliensis</i> (Spreng.) Loes.		+		Not Evaluated
	<i>Ilex brevicuspis</i> Reissek	+	+	+	Not Evaluated
	<i>Ilex cerasifolia</i> Reissek	+	+		Not Evaluated
	<i>Ilex conocarpa</i> Reissek	+	+	+	Not Evaluated
	<i>Ilex dumosa</i> Reissek		+	+	Not Evaluated
	<i>Ilex integerrima</i> (Vell.) Reissek		+		Not Evaluated
	<i>Ilex microdonta</i> Reissek		+	+	Not Evaluated
	<i>Ilex paraguariensis</i> A.St.-Hil.		+		Least Concern
	<i>Ilex psammophila</i> Mart. ex Reissek		+		Not Evaluated
	<i>Ilex pseudobuxus</i> Reissek		+	+	Not Evaluated
Araliaceae	<i>Ilex sapotifolia</i> Reissek	+	+	+	Not Evaluated
	<i>Ilex taubertiana</i> Loes.	+	+	+	Not Evaluated
	<i>Ilex theezans</i> Mart. ex Reissek		+		Not Evaluated
	<i>Aralia warmingiana</i> (Marchal)				
	J.Wen		+		Least Concern
	<i>Dendropanax australis</i> Fiaschi & Jung-Mend.		+		

	<i>Dendropanax cuneatus</i> (DC.) Decne. & Planch.	+		+	+
	<i>Didymopanax angustissimus</i> Marchal				Not Evaluated
	<i>Didymopanax calvus</i> (Cham.) Decne. & Planch.	+	+	+	Not Evaluated
	<i>Didymopanax macrocarpus</i> (Cham. & Schltdl.) Seem.	+	+	+	Not Evaluated
	<i>Didymopanax selloi</i> Marchal	+			Not Evaluated
	<i>Oreopanax capitatus</i> (Jacq.) Decne. & Planch.	+	+	+	Least Concern
	<i>Oreopanax fulvum</i> Marchal	+	+	+	Least Concern
	<i>Schefflera longipetiolata</i> (Pohl ex DC.) Frodin & Fiaschi	+	+	+	Not Evaluated
	<i>Araucaria angustifolia</i> (Bertol.) Kuntze	+		+	Endangered
	<i>Acrocomia aculeata</i> (Jacq.) Lodd. ex Mart.	+		+	Not Evaluated
	<i>Acrocomia intumescens</i> Drude	+			Not Evaluated

<i>Astrocaryum aculeatissimum</i> (Schott) Burret	+	+	+	+	Least Concern
<i>Attalea funifera</i> Mart.				+	Near Threatened
<i>Attalea phalerata</i> Mart. ex Spreng.		+			Least Concern
<i>Bactris acanthocarpa</i> Mart.		+			Not Evaluated
<i>Bactris ferruginea</i> Burret	+	+	+	+	Near Threatened
<i>Bactris setosa</i> Mart.		+			Not Evaluated
<i>Euterpe edulis</i> Mart.	+	+	+	+	Vulnerable
<i>Geonoma gamiova</i> Barb.Rodr.		+			Least Concern
<i>Geonoma pohliana</i> Mart.	+	+	+		Not Evaluated
<i>Geonoma schottiana</i> Mart.	+	+	+	+	Least Concern
<i>Syagrus botryophora</i> (Mart.) Mart.					Least Concern
<i>Syagrus hoehnei</i> Burret					Not Evaluated
<i>Syagrus pseudococos</i> (Raddi) Glassman	+	+	+	+	Least Concern
<i>Syagrus romanzoffiana</i> (Cham.) Glassman	+	+	+	+	Least Concern

Asparagaceae	<i>Cordyline spectabilis</i> Kunth & Bouché	+	+	+	Not Evaluated
	<i>Austroeupeatorium inulaefolium</i> (Kunth) R.M.King & H.Rob.			+	
Asteraceae	<i>Baccharis dentata</i> (Vell.) G.M.Barroso	+			Not Evaluated
	<i>Baccharis lateralis</i> Baker	+			Not Evaluated
	<i>Baccharis oblongifolia</i> (Ruiz & Pav.) Pers.	+	+		Not Evaluated
	<i>Baccharis pingraea</i> DC.				Not Evaluated
	<i>Critonia morifolia</i> (Mill.) R.M.King & H.Rob.	+			
	<i>Dasyphyllum brasiliense</i> (Spreng.) Cabrera	+			Not Evaluated
	<i>Dasyphyllum spinescens</i> (Less.) Cabrera	+			Not Evaluated
	<i>Eremanthus erythropappus</i> (DC.) MacLeish	+			
	<i>Eremanthus incanus</i> (Less.) Less.	+			Not Evaluated
	<i>Heterocondylus alatus</i> (Vell.) R.M.King & H.Rob.	+			
	<i>Moquiniastrum paniculatum</i> (Less.) G. Sancho				

<i>Vernonanthura divaricata</i> (Spreng.) H.Rob.	+	+	+	+	Not Evaluated
<i>Vernonanthura petiolaris</i> (DC.) H.Rob.	+				Not Evaluated
<i>Vernonanthura puberula</i> (Less.) H.Rob.	+				Not Evaluated
Berberidaceae					
<i>Berberis laurina</i> Billb.					Not Evaluated
<i>Cybistax antisiphilitica</i> (Mart.) Mart.	+				Not Evaluated
<i>Dolichandra unguiculata</i> (Vell.) L.G.Lohmann	+			+	+
<i>Handroanthus albus</i> (Cham.) Mattos	+				Least Concern
<i>Handroanthus chrysotrichus</i> (Mart. ex DC.) Mattos	+		+		Not Evaluated
<i>Handroanthus impetiginosus</i> (Mart. ex DC.) Mattos	+		+	+	Near Threatened
<i>Handroanthus ochraceus</i> (Cham.) Mattos	+		+	+	Not Evaluated
<i>Handroanthus pulcherrimus</i> (Sandwith) Mattos	+			+	+

<i>Handroanthus serratifolius</i> (Vahl)						
S.Grose	+	+	+	+	+	Not Evaluated
<i>Handroanthus umbellatus</i> (Sond.)						
Mattos						
<i>Handroanthus vellosi</i> (Toledo)						
Mattos						Not Evaluated
<i>Jacaranda cuspidifolia</i> Mart.		+				Not Evaluated
<i>Jacaranda macrantha</i> Cham.	+	+	+	+	+	Least Concern
<i>Jacaranda micrantha</i> Cham.	+	+	+	+	+	Not Evaluated
<i>Jacaranda obovata</i> Cham.		+	+	+	+	Not Evaluated
<i>Jacaranda puberula</i> Cham.	+	+	+	+	+	Least Concern
<i>Paratecoma peroba</i> (Record)						
Kuhlmann		+				Endangered
<i>Sparattosperma leucanthum</i> (Vell.) K.Schum.						
<i>Tabebuia aurea</i> (Silva Manso) Benth. & Hook.f. ex S.Moore						
<i>Tabebuia cassinoidea</i> (Lam.) DC.		+				Endangered
<i>Tabebuia elliptica</i> (DC.)						
Sandwith		+				Not Evaluated
<i>Tabebuia obtusifolia</i> (Cham.)						
Bureau		+				Least Concern

<i>Tabebuia roseoalba</i> (Ridl.) Sandwith	+	+	+	+	Not Evaluated
<i>Tabebuia stenocalyx</i> Sprague & Stapf		+	+	+	Not Evaluated
<i>Zeyheria tuberculosa</i> (Vell.) Bureau ex Verl.		+	+	+	Vulnerable
<i>Bixa orellana</i> L.					Not Evaluated
Bixaceae					
<i>Cordia alliodora</i> (Ruiz & Pav.) Cham.	+	+	+	+	Not Evaluated
<i>Cordia americana</i> (L.) Gottschling & J.S.Mill.	+	+	+	+	Not Evaluated
<i>Cordia ecalyculata</i> Vell.	+	+	+	+	Not Evaluated
<i>Cordia magnoliifolia</i> Cham.	+	+	+	+	Not Evaluated
<i>Cordia nodosa</i> Lam.		+			Not Evaluated
<i>Cordia rufescens</i> A.DC.					Not Evaluated
<i>Cordia sellowiana</i> Cham.	+	+	+	+	Not Evaluated
<i>Cordia silvestris</i> Fresen.	+	+	+	+	Least Concern
<i>Cordia superba</i> Cham.	+	+	+	+	Not Evaluated
<i>Cordia taguahyensis</i> Vell.		+			Not Evaluated

<i>Cordia toqueve</i> Aubl.							Not Evaluated
<i>Cordia trichoclada</i> DC.	+	+	+				Least Concern
<i>Cordia trichotoma</i> (Vell.) Arráb. ex Steud.		+	+			+	Not Evaluated
Burseraceae							
<i>Commiphora leptophloeos</i> (Mart.) J.B.Gillett		+	+			+	+
<i>Protium aracouchini</i> (Aubl.) Marchand		+	+			+	Not Evaluated
<i>Protium catuaba</i> (Soares da Cunha) Daly & P.Fine	+	+	+				Not Evaluated
<i>Protium heptaphyllum</i> (Aubl.) Marchand	+	+	+				Data Deficient
<i>Protium icicariba</i> (DC.) Marchand		+	+				Endangered
<i>Protium kleinii</i> Cuatrec.	+	+	+			+	Least Concern
<i>Protium spruceanum</i> (Benth.) Engl.		+					Not Evaluated
<i>Protium warmingianum</i> Marchand		+	+			+	Not Evaluated
<i>Protium widgrenii</i> Engl.	+	+	+			+	Not Evaluated

Cactaceae	<i>Brasiliopuntia brasiliensis</i> (Willd.) A.Berger	+			Least Concern
	<i>Cereus hildmannianus</i> K.Schum.	+	+		Not Evaluated
	<i>Cereus jamacaru</i> DC.	+			Not Evaluated
	<i>Inga cylindrica</i> (Vell.) Mart.	+	+	+	Not Evaluated
Calophyllaceae	<i>Calophyllum brasiliense</i> Cambess.	+	+	+	Not Evaluated
	<i>Caraipa densifolia</i> Mart.		+	+	Not Evaluated
	<i>Kielmeyera albopunctata</i> Saddi	+	+	+	Not Evaluated
	<i>Kielmeyera lathrophyton</i> Saddi	+			Not Evaluated
	<i>Kielmeyera rugosa</i> Choisy				Not Evaluated
Canellaceae	<i>Cinnamodendron dinisii</i> Schwacke	+	+	+	Not Evaluated
Cannabaceae	<i>Celtis brasiliensis</i> (Gardner) Planch.	+			Not Evaluated
	<i>Celtis iguanaea</i> (Jacq.) Sarg.	+	+	+	Not Evaluated
	<i>Trema micrantha</i> (L.) Blume	+			Not Evaluated

Capparaceae	<i>Capparidastrium frondosum</i> (Jacq.) Cornejo &				
	Itlis	+			
	<i>Craterva tapia</i> L.	+			Not Evaluated
	<i>Cynophalla flexuosa</i> (L.) J.Presl	+			Not Evaluated
Cardiopteridaceae	<i>Cynophalla hastata</i> (Jacq.) J.Presl	+			Not Evaluated
	<i>Citronella gongonha</i> (Mart.)				
	R.A.Howard	+	+	+	Not Evaluated
	<i>Citronella paniculata</i> (Mart.)				
Caricaceae	R.A.Howard	+	+	+	Not Evaluated
	<i>Jacaratia spinosa</i> (Aubl.) A.DC.	+			Least Concern
Caryocaraceae	<i>Caryocar edule</i> Casar.	+			Least Concern
	<i>Cheiloclinium cognatum</i> (Miers)				
Celastraceae	A.C.Sm.	+			Not Evaluated
	<i>Monteverdia aquifolia</i> (Mart.)				
	Biral	+	+		Not Evaluated
	<i>Monteverdia ardisiifolia</i> (Reissek) Biral	+	+	+	Not Evaluated

<i>Monteverdia brasiliensis</i> (Mart.) Biral	+	+	+	+	Not Evaluated
<i>Monteverdia cestrifolia</i> (Reissek) Biral	+	+	+		Not Evaluated
<i>Monteverdia communis</i> (Reissek) Biral	+	+	+	+	Not Evaluated
<i>Monteverdia dasyclada</i> (Mart.) Biral		+			Not Evaluated
<i>Monteverdia distichophylla</i> (Mart. ex Reissek) Biral		+			Not Evaluated
<i>Monteverdia erythroxyla</i> (Reissek) Biral		+			Not Evaluated
<i>Monteverdia evonymoides</i> (Reissek) Biral		+			Not Evaluated
<i>Monteverdia glaucescens</i> (Reissek) Biral		+			Not Evaluated
<i>Monteverdia gonoclada</i> (Mart.) Biral	+	+	+		Not Evaluated
<i>Monteverdia littoralis</i> (R.M. Carvalho-Okano) Biral	+	+	+	+	Not Evaluated

<i>Monteverdia obtusifolia</i> (Mart.) Biral	+					Not Evaluated
<i>Monteverdia patens</i> (Reissek) Biral	+					Not Evaluated
<i>Monteverdia schumanniana</i> (Loes.) Biral	+					Not Evaluated
<i>Monteverdia ilicifolia</i> (Mart. ex Reissek) Biral.	+	+		+		Not Evaluated
<i>Plenckia populnea</i> Reissek						Not Evaluated
<i>Salacia arborea</i> (Schrunk) Peyr.	+	+		+	+	Least Concern
<i>Salacia elliptica</i> (Mart.) G. Don	+					Not Evaluated
<i>Salacia grandifolia</i> (Mart.) G.Don	+					Not Evaluated
<i>Hedyosmum brasiliense</i> Mart. ex Miq.	+					Not Evaluated
Chloranthaceae						
<i>Couepia belemii</i> Prance	+			+	+	Vulnerable
<i>Couepia rufa</i> Ducke	+					Not Evaluated
<i>Couepia schottii</i> Fritsch	+					Endangered
<i>Couepia venosa</i> Prance	+			+		Not Evaluated

<i>Hirtella angustifolia</i> Schott ex Spreng.	+			Not Evaluated
<i>Hirtella bicornis</i> Mart. & Zucc.		+	+	Not Evaluated
<i>Hirtella gracilipes</i> (Hook.f.) Prance	+			Not Evaluated
<i>Hirtella hebeclada</i> Moric. ex DC.	+	+		Not Evaluated
<i>Hirtella triandra</i> Sw.	+			Not Evaluated
<i>Hymenopus heteromorphus</i> (Benth.) Sothers & Prance	+			
<i>Leptobalanus octandrus</i> (Hoffmanns. ex Roem. & Schult.) Sothers & Prance	+	+		+
<i>Licania hoehnei</i> Pilg.	+			Not Evaluated
<i>Licania hypoleuca</i> Benth.	+	+	+	Not Evaluated
<i>Licania kunthiana</i> Hook.f.	+	+	+	Not Evaluated
<i>Licania lamentanda</i> Prance				Not Evaluated
<i>Licania littoralis</i> Warm.	+			Not Evaluated
<i>Licania micrantha</i> Miq.		+	+	Not Evaluated
<i>Microdesmia rigida</i> (Benth.) Sothers & Prance	+	+	+	+
<i>Moquilea tomentosa</i> Benth.	+	+	+	Not Evaluated
<i>Parinari alvimii</i> Pranc	+			Not Evaluated

Clethraceae	<i>Parinari brasiliensis</i> (Schott) Hook.f.	+			+	Endangered
	<i>Clethra scabra</i> Pers.	+	+		+	Least Concern
	<i>Clusia criuva</i> Cambess.	+	+		+	Least Concern
	<i>Clusia lanceolata</i> Cambess.	+				Not Evaluated
	<i>Clusia nemorosa</i> G.Mey.	+				Not Evaluated
	<i>Clusia panapanari</i> (Aubl.) Choisy	+				Not Evaluated
	<i>Clusia spiritui-sancensis</i> G.Mariz & B.Weinberg	+			+	+
	<i>Garcinia brasiliensis</i> Mart.	+	+		+	Not Evaluated
	<i>Garcinia gardneriana</i> (Planch. & Triana) Zappi	+			+	+
	<i>Symphonia globulifera</i> L.f. <i>Tovomita choisyana</i> Planch. & Triana	+			+	Not Evaluated
Clusiaceae	<i>Tovomita fructipendula</i> (Ruiz & Pav.) Cambess.	+			+	Not Evaluated
	<i>Tovomita glazioviana</i> Engl.	+	+		+	Not Evaluated
	<i>Tovomita guianensis</i> Aubl.	+				Not Evaluated

<i>Tovomita longifolia</i> (Rich.) Hochr.	+	+	+	+	Not Evaluated
<i>Tovomita mangle</i> G. Mariz		+			Not Evaluated
<i>Tovomitopsis saldanhae</i> Engl.	+	+	+		Not Evaluated
<i>Combretum duarteanum</i> Cambess.					Not Evaluated
<i>Terminalia australis</i> Cambess.					Not Evaluated
<i>Terminalia corrugata</i> (Ducke) Gere & Boatwr.	+	+	+	+	Not Evaluated
<i>Terminalia dichotoma</i> G.Mey.			+	+	Not Evaluated
<i>Terminalia glabrescens</i> Mart.		+			Not Evaluated
<i>Terminalia januariensis</i> DC.	+	+	+	+	Not Evaluated
<i>Terminalia kleinii</i> (Exell) Gere & Boatwr.	+	+	+		Not Evaluated
<i>Terminalia oblonga</i> (Ruiz & Pav.) Steud.	+	+	+	+	Not Evaluated
<i>Terminalia tetraphylla</i> (Aubl.) Gere & Boatwr.		+	+		
<i>Terminalia triflora</i> (Griseb.) Lillo		+			Not Evaluated
<i>Connarus detersus</i> Planch.	+		+		Not Evaluated

Connaraceae

	<i>Connarus regnellii</i> G.Schellenb.	+	+	+	+	Not Evaluated
	<i>Connarus rostratus</i> (Vell.) L.B.Sm.	+	+	+	+	Least Concern
Cunoniaceae	<i>Lamanonia ternata</i> Vell.	+	+	+	+	Not Evaluated
	<i>Weinmannia humilis</i> Engl.	+	+			Not Evaluated
	<i>Weinmannia paulliniifolia</i> Pohl ex Ser.		+			Near Threatened
Cyperaceae	<i>Inga capitata</i> Desv.	+				Not Evaluated
	<i>Inga cayennensis</i> Sagot ex Benth.	+				Not Evaluated
	<i>Inga tenuis</i> (Vell.) Mart.	+	+		+	Not Evaluated
	<i>Pera glabrata</i> (Schott) Baill.	+	+		+	Not Evaluated
Dichapetalaceae	<i>Stephanopodium blanchetianum</i> Baill.	+	+		+	Not Evaluated
Dilleniaceae	<i>Curatella americana</i> L.					Not Evaluated
	<i>Davilla macrocarpa</i> Eichler	+				Vulnerable
	<i>Davilla rugosa</i> Poir.	+				Not Evaluated

Ebenaceae	<i>Diospyros brasiliensis</i> Mart. ex Miq.	+	+	+	+	Not Evaluated
	<i>Diospyros capreifolia</i> Mart. ex Hiern		+	+	+	Not Evaluated
	<i>Diospyros guianensis</i> (Aubl.) Gürke	+	+	+	+	Not Evaluated
	<i>Diospyros inconstans</i> Jacq.		+			Least Concern
	<i>Diospyros lasiocalyx</i> (Mart.) B.Walln.	+	+	+	+	Not Evaluated
	<i>Sloanea garckeana</i> K.Schum.	+	+	+	+	Least Concern
	<i>Sloanea guianensis</i> (Aubl.) Benth.	+	+	+		Not Evaluated
	<i>Sloanea lasiocomma</i> K.Schum.	+	+	+	+	Not Evaluated
	<i>Sloanea obtusifolia</i> (Moric.) Schum.	+	+	+	+	Endangered
	<i>Sloanea sinemariensis</i> Aubl.		+	+	+	Not Evaluated
Ericaceae	<i>Agarista pulchella</i> Cham. ex G.Don					Not Evaluated

	<i>Gaylussacia brasiliensis</i> (Spreng.) Meisn.	+			Not Evaluated
Erythropalaceae	<i>Heisteria ovata</i> Benth.	+	+		Not Evaluated
	<i>Heisteria perianthomega</i> (Vell.) Sleumer	+			Not Evaluated
	<i>Heisteria silvianii</i> Schwacke	+	+	+	Not Evaluated
	<i>Erythroxylum affine</i> A.St.-Hil.	+	+	+	Not Evaluated
Erythroxylaceae	<i>Erythroxylum ambiguum</i> Peyr.	+			Least Concern
	<i>Erythroxylum argentinum</i> O.E.Schulz	+			Not Evaluated
	<i>Erythroxylum buxus</i> Peyr.	+			Not Evaluated
	<i>Erythroxylum campestre</i> A.St.- Hil.	+			Not Evaluated
	<i>Erythroxylum citrifolium</i> A.St.- Hil.	+			Not Evaluated
	<i>Erythroxylum cuneifolium</i> (Mart.) O.E.Schulz	+			Not Evaluated
	<i>Erythroxylum cuspidifolium</i> Mart.	+	+		Not Evaluated
	<i>Erythroxylum daphnites</i> Mart.				Not Evaluated
	<i>Erythroxylum deciduum</i> A.St.-Hil.	+	+	+	Not Evaluated

<i>Erythroxylum grandifolium</i> Peyr.	+	+	+	+	Not Evaluated
<i>Erythroxylum mucronatum</i> Benth.	+	+			Not Evaluated
<i>Erythroxylum myrsinites</i> Mart.	+	+	+		Least Concern
<i>Erythroxylum nummularium</i> Peyr.	+	+			Not Evaluated
<i>Erythroxylum passerinum</i> Mart.	+	+			Least Concern
<i>Erythroxylum paufferense</i> Plowman	+	+	+	+	Endangered
<i>Erythroxylum pelleterianum</i> A.St.-Hil.	+	+	+	+	Least Concern
<i>Erythroxylum pulchrum</i> A.St.-Hil.	+	+			Least Concern
<i>Erythroxylum simonis</i> Plowman	+	+	+		Not Evaluated
<i>Erythroxylum squamatum</i> Sw.	+	+	+	+	Not Evaluated
<i>Erythroxylum umbu</i> Costa-Lima					Not Evaluated
<i>Erythroxylum vacciniifolium</i> Mart.					Not Evaluated
Escalloniaceae					
<i>Escallonia bifida</i> Link & Otto					Not Evaluated

Actinostemon conceptionis (Chodat & Hassl.)

Euphorbiaceae Hochr. +

<i>Actinostemon concolor</i> (Spreng.) Müll.Arg.	+	+	+	Not Evaluated
<i>Actinostemon klotzschii</i> (Didr.) Pax	+			Not Evaluated
<i>Actinostemon verticillatus</i> (Klotzsch) Baill.	+	+	+	Not Evaluated
<i>Aparisthium cordatum</i> (A.Juss.) Baill.		+		Not Evaluated
<i>Astraea klotzschii</i> Didr.	+	+	+	Not Evaluated
<i>Cnidoscolus oligandrus</i> (Müll.Arg.) Pax			+	Not Evaluated
<i>Cnidoscolus vitifolius</i> (Müll.) Pohl	+	+	+	Not Evaluated
<i>Croton celtidifolius</i> Baill.		+		Not Evaluated
<i>Croton echinocarpus</i> Müll. Arg.		+	+	Not Evaluated
<i>Croton floribundus</i> Spreng.	+	+	+	Not Evaluated
<i>Croton jacobinensis</i> Baill.		+		Not Evaluated
<i>Croton macrobothrys</i> Baill.		+		Not Evaluated
<i>Croton organensis</i> Baill.	+	+	+	Not Evaluated
<i>Croton piptocalyx</i> Müll.Arg.	+	+	+	Not Evaluated
<i>Croton salutaris</i> Casar.		+		Not Evaluated
<i>Croton urticifolius</i> Lam.		+		Not Evaluated

<i>Croton urucurana</i> Baill.	+	+	+	Not Evaluated
<i>Gymnanthes gaudichaudii</i> Müll. Arg.				Not Evaluated
<i>Gymnanthes klotzschiana</i> Müll.Arg.	+	+	+	Not Evaluated
<i>Gymnanthes schottiana</i> Müll.Arg.	+			Not Evaluated
<i>Gymnanthes serrata</i> Baill. ex Müll.Arg.	+	+	+	Not Evaluated
<i>Joannesia princeps</i> Vell.	+	+		Least Concern
<i>Mabea fistulifera</i> Mart.	+			Not Evaluated
<i>Mabea piriri</i> Aubl.	+			Not Evaluated
<i>Manihot grahamii</i> Hook.	+	+	+	Not Evaluated
<i>Manihot pilosa</i> Pohl	+			Not Evaluated
<i>Maprounea brasiliensis</i> A.St.-Hil.	+			Not Evaluated
<i>Maprounea guianensis</i> Aubl.	+	+	+	Not Evaluated
<i>Micrandra elata</i> (Didr.) Müll.Arg.	+			Not Evaluated
<i>Pachystroma longifolium</i> (Nees) I.M.Johnst.	+	+	+	Not Evaluated
<i>Pausandra morisiana</i> (Casar.) Radlk.	+	+	+	Not Evaluated

<i>Philyra brasiliensis</i> Klotzsch	+				Not Evaluated
<i>Sapium glandulosum</i> (L.) Morong	+				Not Evaluated
<i>Sebastiania brasiliensis</i> Spreng.	+				Not Evaluated
<i>Sebastiania jacobinensis</i> (Müll.Arg.) Müll.Arg.	+				
<i>Senefeldera verticillata</i> (Vell.) Croizat	+	+	+		Not Evaluated
<i>Tetrorchidium rubrivenium</i> Poepp.	+	+	+	+	Least Concern
<i>Abarema brachystachya</i> (DC.) Barneby & J.W.Grimes	+				
<i>Abarema cochliacarpus</i> (Gomes) Barneby & J.W.Grimes	+			+	+
<i>Abarema filamentosa</i> (Benth.) Pittier	+				Least Concern
<i>Abarema langsdorffii</i> (Benth.) Barneby & J.W.Grimes	+	+			Not Evaluated
<i>Acacia mearnsii</i> De Wild.					Not Evaluated
<i>Acosmium cardenasii</i> H.S.Irwin & Arroyo					Not Evaluated

<i>Acosmium lentiscifolium</i> Schott	+				Not Evaluated
<i>Albizia edwallii</i> (Hoehe) Barneby & J.W.Grimes	+	+			+
<i>Albizia niopoides</i> (Spruce ex Benth.) Burkart	+	+	+	+	Least Concern
<i>Albizia pedicellaris</i> (DC.) L.Rico	+	+	+	+	Not Evaluated
<i>Albizia polycephala</i> (Benth.) Killip ex Record	+	+	+	+	Not Evaluated
<i>Amburana cearensis</i> (Allemão) A.C.Sm.	+				Near Threatened
<i>Anadenanthera colubrina</i> (Vell.) Brenan	+	+			Not Evaluated
<i>Anadenanthera peregrina</i> (L.) Speg.	+	+	+	+	Not Evaluated
<i>Andira anthelmia</i> (Vell.) Benth.	+				Not Evaluated
<i>Andira fraxinifolia</i> Benth.	+	+	+	+	Not Evaluated
<i>Andira legalis</i> (Vell.) Toledo	+				Not Evaluated
<i>Andira nitida</i> Mart. ex Benth.	+	+	+	+	Not Evaluated
<i>Andira ormosioides</i> Benth.	+	+	+	+	Not Evaluated
<i>Andira vermifuga</i> (Mart.) Benth.	+				Least Concern

<i>Apuleia leiocarpa</i> (Vogel)						
J.F.Macbr.	+	+	+			Vulnerable
<i>Arapatiella psilophylla</i> (Harms)						
R.S.Cowan	+					Least Concern
<i>Ateleia glazioviana</i> Baill.	+	+	+			Not Evaluated
<i>Barnebydendron riedelii</i> (Tul.)						
J.H.Kirkbr.						Not Evaluated
<i>Bauhinia acuruana</i> Moric.	+	+				Not Evaluated
<i>Bauhinia brevipes</i> Vogel	+					Not Evaluated
<i>Bauhinia forficata</i> Link	+	+				Not Evaluated
<i>Bauhinia longifolia</i> (Bong.)						
Steud.	+					Not Evaluated
<i>Bauhinia rufa</i> (Bong.) Steud.	+	+				Not Evaluated
<i>Bauhinia unguolata</i> L.	+					Not Evaluated
<i>Bowdichia virgilioides</i> Kunth	+					Near Threatened
<i>Calliandra brevipes</i> Benth.	+	+				Not Evaluated
<i>Calliandra foliolosa</i> Benth.	+					Not Evaluated
<i>Calliandra tweedii</i> Benth.	+					Not Evaluated
<i>Cassia ferruginea</i> (Schrad.)						
Schrad. ex DC.	+	+	+			Not Evaluated
<i>Cassia grandis</i> L.f.	+					Not Evaluated

<i>Cassia leptophylla</i> Vogel	+	+	+	+	Not Evaluated
<i>Cenostigma pluviosum</i> (DC.) Gagnon & G.P.Lewis	+				
<i>Cenostigma pyramidale</i> (Tul.) Gagnon & G.P.Lewis					
<i>Centrolobium robustum</i> (Vell.) Mart. ex Benth.	+	+	+	+	+
<i>Centrolobium tomentosum</i> Guillem. ex Benth.	+				
<i>Chamaecrista bahiae</i> (H.S.Irwin) H.S.Irwin & Barneby	+	+	+	+	+
<i>Chamaecrista duartei</i> (H.S.Irwin)					
H.S.Irwin & Barneby	+	+	+	+	Not Evaluated
<i>Chamaecrista ensiformis</i> (Vell.) H.S.Irwin & Barneby	+				
<i>Chloroleucon dumosum</i> (Benth.)					
G.P.Lewis					Not Evaluated
<i>Chloroleucon foliolosum</i> (Benth.) G.P.Lewis					
<i>Chloroleucon tortum</i> (Mart.)					
Pittier	+	+	+	+	Near Threatened
<i>Copaifera langsdorffii</i> Desf.	+	+	+	+	Not Evaluated
<i>Copaifera lucens</i> Dwyer	+	+	+	+	Not Evaluated

<i>Copaifera trapezifolia</i> Hayne	+			Not Evaluated
<i>Cyclolobium brasiliense</i> Benth.	+			Not Evaluated
<i>Dahlstedtia floribunda</i> (Vogel)				
M.J. Silva & A.M.G. Azevedo	+	+	+	Not Evaluated
<i>Dahlstedtia muehlbergiana</i> (Hassl.) M.J.Silva & A.M.G.Azevedo	+	+	+	Not Evaluated
<i>Dahlstedtia pentaphylla</i> (Taub.) Burkart	+			Not Evaluated
<i>Dahlstedtia pinnata</i> (Benth.) Malme	+	+	+	Not Evaluated
<i>Dalbergia brasiliensis</i> Vogel	+			Not Evaluated
<i>Dalbergia elegans</i> A.M.Carvalho	+	+	+	Not Evaluated
<i>Dalbergia frutescens</i> (Vell.) Britton		+	+	Vulnerable
<i>Dalbergia miscolobium</i> Benth.	+			Not Evaluated
<i>Dalbergia nigra</i> (Vell.) Allemão ex Benth.				Not Evaluated
<i>Dalbergia villosa</i> (Benth.) Benth.	+			Vulnerable
<i>Deguelia costata</i> (Benth.) A.M.G.Azevedo & R.A.Camargo	+	+	+	Not Evaluated

<i>Dialium guianense</i> (Aubl.)						
Sandwith	+	+	+	+	+	Not Evaluated
<i>Dimorphandra jorgei</i> M.F.Silva						Not Evaluated
<i>Diplothropis incexis</i> Rizzini & A.Mattos						Not Evaluated
<i>Enterolobium contortisiliquum</i> (Vell.) Morong					+	+
<i>Erythrina falcata</i> Benth.	+		+	+	+	Not Evaluated
<i>Erythrina verna</i> Vell.						Not Evaluated
<i>Exostyles venusta</i> Schott				+	+	Not Evaluated
<i>Goniorrhachis marginata</i> Taub.						Not Evaluated
<i>Harleyodendron unifoliolatum</i>						
R.S.Cowan				+		Not Evaluated
<i>Holocalyx balansae</i> Micheli			+		+	Not Evaluated
<i>Hymenaea courbaril</i> L.				+		Least Concern
<i>Hymenaea martiana</i> Hayne				+		Least Concern
<i>Hymenaea oblongifolia</i> Huber				+	+	Not Evaluated
<i>Hymenolobium janeirensense</i> Kuhlman.				+	+	Least Concern
<i>Hymenolobium nitidum</i> Benth.				+	+	Not Evaluated
<i>Indigofera suffruticosa</i> Mill.				+		Not Evaluated
<i>Inga blanchetiana</i> Benth.				+	+	Least Concern
<i>Inga bullata</i> Benth.				+		Near Threatened

<i>Inga edulis</i> Mart.	+			Not Evaluated
<i>Inga edwallii</i> (Harms) T.D.Penn.	+			Not Evaluated
<i>Inga flagelliformis</i> (Vell.) Mart.	+	+	+	Not Evaluated
<i>Inga grazielae</i> (Vinha) T.D.Penn.	+	+	+	Vulnerable
<i>Inga hispida</i> Schott ex Benth.	+	+	+	Least Concern
<i>Inga ingoides</i> (Rich.) Willd.	+			Not Evaluated
<i>Inga lanceifolia</i> Benth.				Least Concern
<i>Inga laurina</i> (Sw.) Willd.	+			Least Concern
<i>Inga lentiscifolia</i> Benth.	+			Near Threatened
<i>Inga marginata</i> Willd.	+	+	+	Not Evaluated
<i>Inga schinifolia</i> Benth.		+	+	Not Evaluated
<i>Inga sellowiana</i> Benth.	+			Near Threatened
<i>Inga sessilis</i> (Vell.) Mart.	+	+	+	Not Evaluated
<i>Inga striata</i> Benth.	+			Not Evaluated
<i>Inga subnuda</i> Salzm. ex Benth.	+			Not Evaluated
<i>Inga thibaudiana</i> DC.	+	+	+	Not Evaluated
<i>Inga vera</i> Willd.	+			Not Evaluated
<i>Inga virescens</i> Benth.	+	+	+	Not Evaluated
<i>Inga vulpina</i> Mart. ex Benth.	+			Not Evaluated
<i>Leucochloron incuriale</i> (Vell.) Barneby & J.W.Grimes	+			Not Evaluated

<i>Machaerium paraguayense</i> Hassl.				+	+	+	Least Concern
<i>Machaerium pedicellatum</i> Vogel				+	+	+	Not Evaluated
<i>Machaerium salzmannii</i> Benth.		+					Not Evaluated
<i>Machaerium scleroxylon</i> Tul.		+		+	+	+	Not Evaluated
<i>Machaerium stipitatum</i> Vogel		+		+	+	+	Not Evaluated
<i>Machaerium villosum</i> Vogel		+		+	+		Least Concern
<i>Macrolobium latifolium</i> Vogel				+			Not Evaluated
<i>Melanoxylon brauna</i> Schott				+			Vulnerable
<i>Mimosa bimucronata</i> (DC.) Kuntze				+			Not Evaluated
<i>Mimosa scabrella</i> Benth.				+			Not Evaluated
<i>Mimosa tenuiflora</i> (Willd.) Poir. <i>Muelleria campestris</i> (Mart. ex Benth.) M.J. Silva & A.M.G. Azevedo				+			Not Evaluated
<i>Myrocarpus frondosus</i> Allemão				+	+	+	Least Concern
<i>Myroxylon peruiferum</i> L.f.				+	+	+	Least Concern
<i>Ormosia arborea</i> (Vell.) Harms		+		+	+		Not Evaluated
<i>Ormosia fastigiata</i> Tul.		+		+	+		Not Evaluated
<i>Parapiptadenia pterosperma</i> (Benth.) Brenan				+			

<i>Parapiptadenia rigida</i> (Benth.) Brenan	+	+	+	+	Not Evaluated
<i>Parkia pendula</i> (Willd.) Benth. ex Walp.	+				Not Evaluated
<i>Paubrasilia echinata</i> (Lam.) Gagnon, H.C.Lima & G.P.Lewis		+			
<i>Peltophorum dubium</i> (Spreng.) Taub.	+	+	+	+	Not Evaluated
<i>Piptadenia gonoacantha</i> (Mart.) J.F.Macbr.		+	+	+	Least Concern
<i>Piptadenia paniculata</i> Benth.	+	+	+		Not Evaluated
<i>Plathymenia reticulata</i> Benth.	+	+	+		Least Concern
<i>Platycyamus regnellii</i> Benth.		+			Not Evaluated
<i>Platymiscium floribundum</i> Vogel		+			Not Evaluated
<i>Platymiscium pubescens</i> Micheli		+			Not Evaluated
<i>Platypodium elegans</i> Vogel		+			Not Evaluated
<i>Poecilanthe falcata</i> (Vell.) Heringer		+	+	+	Not Evaluated
<i>Poecilanthe parviflora</i> Benth.		+	+	+	Least Concern
<i>Poeppigia procera</i> (Poepp. ex Spreng.) C. Presl	+	+	+	+	Not Evaluated

<i>Pseudoptiptadenia bahiana</i> G.P.Lewis & M.P.Lima	+		+	+
<i>Pseudoptiptadenia contorta</i> (DC.) G.P.Lewis & M.P.Lima	+		+	Not Evaluated
<i>Pseudoptiptadenia inaequalis</i> (Benth.) Rauschert	+			
<i>Pseudoptiptadenia leptostachya</i> (Benth.) Rauschert	+	+	+	Not Evaluated
<i>Pseudoptiptadenia warmingii</i> (Benth.) G.P.Lewis & M.P.Lima	+			
<i>Pterocarpus rohrii</i> Vahl	+	+	+	Not Evaluated
<i>Pterodon emarginatus</i> Vogel	+	+	+	Not Evaluated
<i>Pterogyne nitens</i> Tul.	+	+	+	Least Concern
<i>Samanea saman</i> (Jacq.) Merr.	+			Not Evaluated
<i>Schizolobium parahyba</i> (Vell.) Blake	+			Not Evaluated
<i>Senegalia bonariensis</i> (Gillies ex Hook. & Arn.) Seigler & Ebinger	+			
<i>Senegalia langsdorffii</i> (Benth.) Seigler & Ebinger	+			

<i>Stryphnodendron pulcherrimum</i> (Willd.) Hochr.		+		+	+
<i>Swartzia acutifolia</i> Vogel	+		+		Least Concern
<i>Swartzia apetala</i> Raddi		+			Not Evaluated
<i>Swartzia flaemingii</i> Raddi	+	+			Least Concern
<i>Swartzia langsdorffii</i> Raddi	+		+	+	Not Evaluated
<i>Swartzia macrostachya</i> Benth.		+			Not Evaluated
<i>Swartzia myrtifolia</i> Sm.		+			Not Evaluated
<i>Swartzia oblata</i> R.S.Cowan		+			Not Evaluated
<i>Swartzia pickelii</i> Killip ex Ducke	+		+		Least Concern
<i>Swartzia simplex</i> (Sw.) Spreng.	+	+	+	+	Least Concern
<i>Sweetia fruticosa</i> Spreng.		+	+	+	Not Evaluated
<i>Tachigali densiflora</i> (Benth.) L.G.Silva & H.C.Lima		+		+	+
<i>Tachigali denudata</i> (Vogel) Oliveira-Filho		+	+		Near Threatened
<i>Tachigali paratyensis</i> (Vell.) H.C.Lima	+	+	+	+	Not Evaluated
<i>Tachigali pilgeriana</i> (Harms) Oliveira-Filho		+			Near Threatened

Tachigali rugosa (Mart. ex Benth.) Zarucchi &

Pipoly	+				
<i>Vataireopsis araroba</i> (Aguiar)					
Ducke	+	+	+	+	Not Evaluated
<i>Zollernia glabra</i> (Spreng.)					
Yakovlev	+				Least Concern
<i>Zollernia ilicifolia</i> (Brongn.)					
Vogel	+	+	+		Not Evaluated
<i>Zollernia modesta</i> A.M.Carvalho					
& Barneby	+	+	+	+	Near Threatened
<i>Zygia latifolia</i> (L.) Fawc. &					
Rendle	+				Not Evaluated
<i>Humiriastrum dentatum</i> (Casar.)					
Cuatrec.	+				Not Evaluated
<i>Humiriastrum glaziovii</i> (Urb.)					
Cuatrec.	+	+	+		Not Evaluated
<i>Sacoglottis mattogrossensis</i>					
Malme					Not Evaluated
<i>Vananea compacta</i> (Schnizl.)					
Cuatrec.	+				Not Evaluated

Humiriaceae

Hypericaceae	<i>Vismia brasiliensis</i> Choisy	+			Not Evaluated
	<i>Vismia guianensis</i> (Aubl.) Choisy	+			Not Evaluated
Icacinaceae	<i>Leretia cordata</i> Vell.	+	+	+	Not Evaluated
	<i>Lacistema aggregatum</i> (P.J.Bergius) Rusby	+	+	+	Not Evaluated
Lacistemataceae	<i>Lacistema lucidum</i> Schnizl.	+			Data Deficient
	<i>Lacistema pubescens</i> Mart.	+	+	+	Not Evaluated
	<i>Lacistema robustum</i> Schnizl.	+			Near Threatened
Lamiaceae	<i>Aegiphila brachiata</i> Vell.	+	+	+	Not Evaluated
	<i>Aegiphila fluminensis</i> Vell.	+	+		Not Evaluated
	<i>Aegiphila integrifolia</i> (Jacq.) Moldenke	+			Not Evaluated
	<i>Aegiphila mediterranea</i> Vell.				Not Evaluated
	<i>Aegiphila vitelliniflora</i> Walp.				Not Evaluated
	<i>Hyptidendron asperrimum</i> (Spreng.) Harley	+	+	+	Least Concern
	<i>Vitex capitata</i> Vahl	+	+	+	Not Evaluated

<i>Vitex cymosa</i> Bertero ex Spreng.	+	+	+	Not Evaluated
<i>Vitex megapotamica</i> (Spreng.) Moldenke	+	+	+	Not Evaluated
<i>Vitex orinocensis</i> Kunth		+	+	Not Evaluated
<i>Vitex polygama</i> Cham.	+			Not Evaluated
<i>Vitex rufescens</i> A.Juss.	+			Not Evaluated
<i>Vitex sellowiana</i> Cham.	+			Not Evaluated
<i>Vitex triflora</i> Vahl	+	+	+	Not Evaluated
Lauraceae				
<i>Aiouea acarodomatifera</i> Kosterm.	+	+	+	Least Concern
<i>Aiouea glaziovii</i> (Mez) R.Rohde	+	+	+	Not Evaluated
<i>Aiouea saligna</i> Meisn.	+			Not Evaluated
<i>Aniba intermedia</i> (Meisn.) Mez	+	+		Near Threatened
<i>Aniba viridis</i> Mez	+			Not Evaluated
<i>Beilschmiedia emarginata</i> (Meisn.) Kosterm.	+		+	+
<i>Beilschmiedia linharensis</i> Sa. Nishida & van der Werff			+	+
<i>Cinnamomum amoenum</i> (Nees & Mart.) Kosterm.	+	+		Not Evaluated
<i>Cinnamomum pseudoglaziovii</i> (Lorea-Hern.) Van der Werff	+			

<i>Nectandra leucantha</i> Nees & Mart.	+				Not Evaluated
<i>Nectandra megapotamica</i> (Spreng.) Mez	+	+	+	+	Not Evaluated
<i>Nectandra membranacea</i> (Sw.) Griseb.	+	+	+	+	Not Evaluated
<i>Nectandra nitidula</i> Nees & Mart.	+				Not Evaluated
<i>Nectandra oppositifolia</i> Nees & Mart.	+				Not Evaluated
<i>Nectandra psammophila</i> Nees	+	+	+	+	Not Evaluated
<i>Nectandra puberula</i> (Schott) Nees	+				Least Concern
<i>Nectandra reticulata</i> (Ruiz & Pav.) Mez	+	+	+	+	Not Evaluated
<i>Ocotea aciphylla</i> (Nees & Mart.) Mez	+	+	+	+	Not Evaluated
<i>Ocotea argentea</i> Mez	+	+	+	+	Near Threatened
<i>Ocotea canaliculata</i> (Rich.) Mez	+	+	+	+	Not Evaluated
<i>Ocotea catharinensis</i> Mez	+				Not Evaluated
<i>Ocotea corymbosa</i> (Meisn.) Mez	+	+	+	+	Vulnerable
<i>Ocotea daphnifolia</i> (Meisn.) Mez	+	+	+	+	Not Evaluated
<i>Ocotea deflexa</i> Rohwer	+	+	+	+	Least Concern
	+				Not Evaluated

<i>Ocotea diospyrifolia</i> (Meisn.) Mez	+	+	+	+	Not Evaluated
<i>Ocotea dispersa</i> (Nees & Mart.) Mez	+	+	+	+	Not Evaluated
<i>Ocotea divaricata</i> (Nees) Mez	+	+	+	+	Not Evaluated
<i>Ocotea fasciculata</i> (Nees) Mez	+	+	+	+	Not Evaluated
<i>Ocotea floribunda</i> (Sw.) Mez		+	+	+	Not Evaluated
<i>Ocotea glauca</i> (Nees & Mart.) Mez	+	+	+	+	Not Evaluated
<i>Ocotea glaziovii</i> Mez	+	+	+		Not Evaluated
<i>Ocotea glomerata</i> (Nees) Mez		+	+	+	Not Evaluated
<i>Ocotea indecora</i> (Schott) Mez	+	+	+	+	Not Evaluated
<i>Ocotea insignis</i> Mez			+	+	Not Evaluated
<i>Ocotea lanata</i> (Nees & Mart.) Mez	+	+	+	+	Not Evaluated
<i>Ocotea lancifolia</i> (Schott) Mez	+	+	+	+	Least Concern
<i>Ocotea laxa</i> (Nees) Mez	+	+	+	+	Least Concern
<i>Ocotea leucoxydon</i> (Sw.) Laness.					Not Evaluated
<i>Ocotea longifolia</i> Kunth		+	+	+	Not Evaluated
<i>Ocotea mandioccana</i> A.Quinet		+	+	+	Not Evaluated

<i>Ocotea minarum</i> (Nees & Mart.) Mez	+	+	+	+	Not Evaluated
<i>Ocotea montana</i> (Meisn.) Mez					Not Evaluated
<i>Ocotea nectandrifolia</i> Mez		+			Least Concern
<i>Ocotea nitida</i> (Meisn.) Rohwer		+	+	+	Not Evaluated
<i>Ocotea notata</i> (Nees & Mart.) Mez					
<i>Ocotea nutans</i> (Nees) Mez	+	+	+	+	Not Evaluated
<i>Ocotea odorifera</i> (Vell.) Rohwer	+	+	+	+	Endangered
<i>Ocotea paranapiacabensis</i> Coe- Teixeira	+				Not Evaluated
<i>Ocotea percurrrens</i> Vicent.					Not Evaluated
<i>Ocotea porosa</i> (Nees & Mart.) Barroso		+			Endangered
<i>Ocotea puberula</i> (Rich.) Nees		+			Near Threatened
<i>Ocotea pulchella</i> (Nees & Mart.) Mez	+	+			Least Concern
<i>Ocotea pulchra</i> Vattimo-Gil		+			Not Evaluated
<i>Ocotea silvestris</i> Vattimo-Gil	+	+	+	+	Least Concern
<i>Ocotea spectabilis</i> (Meisn.) Mez		+			Not Evaluated

<i>Ocotea tabacifolia</i> (Meisn.) Rohwer							Endangered
<i>Ocotea teleiandra</i> (Meisn.) Mez	+	+	+	+			Not Evaluated
<i>Ocotea urbaniana</i> Mez		+	+		+		Not Evaluated
<i>Ocotea velloziana</i> (Meisn.) Mez		+	+				Not Evaluated
<i>Ocotea velutina</i> (Nees) Rohwer	+	+	+				Not Evaluated
<i>Ocotea venulosa</i> (Nees) Baitello		+	+				Not Evaluated
<i>Ocotea villosa</i> Kosterm.		+	+				Not Evaluated
<i>Persea alba</i> Nees & Mart.		+	+				Not Evaluated
<i>Persea major</i> (Meisn.) L.E.Kopp	+	+	+				Not Evaluated
<i>Persea venosa</i> Nees & Mart.		+	+				Not Evaluated
<i>Persea willdenovii</i> Kosterm.		+	+		+		Least Concern
<i>Phyllostemonodaphne geminiflora</i> (Mez) Kosterm.		+					
<i>Rhodostemonodaphne macrocalyx</i> (Meisn.) Rohwer ex Madriñán		+			+		+
<i>Urbanodendron bahiense</i> (Meisn.) Rohwer		+	+		+		Vulnerable
<i>Cariniana domestica</i> (Mart.) Miers	+	+	+		+		Not Evaluated

Lecythidaceae

<i>Cariniana estrellensis</i> (Raddi)						
Kuntze	+	+	+	+	+	Not Evaluated
<i>Cariniana legalis</i> (Mart.) Kuntze		+				Endangered
<i>Couratari pyramidata</i> (Vell.)						
Kunth	+	+	+	+	+	Endangered
<i>Eschweilera alvimii</i> S.A.Mori		+				Endangered
<i>Eschweilera ovata</i> (Cambess.) Mart. ex Miers		+				
<i>Gustavia augusta</i> L.		+	+	+	+	Not Evaluated
<i>Lecythis lanceolata</i> Poir.	+	+	+	+	+	Least Concern
<i>Lecythis lurida</i> (Miers) S.A.Mori		+				Least Concern
<i>Lecythis pisonis</i> Cambess.		+	+	+	+	Not Evaluated
<i>Strychnos bahiensis</i> Krukoff & Barneby						Not Evaluated
<i>Strychnos brasiliensis</i> (Spreng.) Mart.			+			Not Evaluated
<i>Strychnos trinervis</i> (Vell.) Mart.	+		+	+	+	Least Concern
<i>Magnolia ovata</i> (A.St.-Hil.) Spreng.						
		+				Least Concern

Loganiaceae

Magnoliaceae

Malpighiaceae

<i>Bunchosia maritima</i> (Vell.) J.F.Macbr.				+	+	+	+	Least Concern
<i>Bunchosia pallescens</i> Skottsb.				+				Least Concern
<i>Byrsonima cacaophila</i> W.R.Anderson								Near Threatened
<i>Byrsonima crispa</i> A.Juss.				+			+	Not Evaluated
<i>Byrsonima gardneriana</i> A.Juss.				+				Not Evaluated
<i>Byrsonima japurensis</i> A.Juss.								Least Concern
<i>Byrsonima laxiflora</i> Griseb.			+	+			+	Not Evaluated
<i>Byrsonima ligustrifolia</i> A.Juss.				+				Not Evaluated
<i>Byrsonima myricifolia</i> Griseb.			+	+			+	Not Evaluated
<i>Byrsonima nitidifolia</i> A.Juss.			+	+			+	Not Evaluated
<i>Byrsonima pachyphylla</i> A.Juss.				+				Not Evaluated
<i>Byrsonima salzmanniana</i> A.Juss.							+	Not Evaluated
<i>Byrsonima sericea</i> DC.				+				Not Evaluated
<i>Byrsonima stipulacea</i> A.Juss.				+			+	Not Evaluated
<i>Byrsonima variabilis</i> A.Juss.							+	Least Concern
<i>Heteropterys byrsonimifolia</i> A.Juss.								Not Evaluated
<i>Apeiba albiflora</i> Ducke								Not Evaluated

Malvaceae

<i>Apeiba tibourbou</i> Aubl.	+	+	+	+	+	Not Evaluated
<i>Bastardiopsis densiflora</i> (Hook. & Arn.) Hassl.	+	+	+			Not Evaluated
<i>Cavanillesia umbellata</i> Ruiz & Pav.		+				Least Concern
<i>Ceiba glaziovii</i> (Kuntze)						
K.Schum.	+	+	+	+		Not Evaluated
<i>Ceiba pubiflora</i> (A.St.-Hil.)						
K.Schum.		+				Not Evaluated
<i>Ceiba speciosa</i> (A.St.-Hil.)						
Ravenna	+	+	+			Not Evaluated
<i>Christiana africana</i> DC		+				Not Evaluated
<i>Eriotheca candolleana</i> (K.Schum.) A.Robyns		+			+	+
<i>Eriotheca gracilipes</i> (K.Schum.)						
A.Robyns		+	+	+		Not Evaluated
<i>Eriotheca macrophylla</i>						
(K.Schum.) A.Robyns	+	+	+	+		Not Evaluated
<i>Eriotheca pentaphylla</i> (Vell.)						
A.Robyns	+	+	+			Not Evaluated
<i>Guazuma crinita</i> Mart.						Not Evaluated
<i>Guazuma ulmifolia</i> Lam.	+	+	+			Not Evaluated

<i>Helicteres ovata</i> Lam.	+				Not Evaluated
<i>Heliocarpus popayanensis</i> Kunth					Not Evaluated
<i>Hydrogaster trinervis</i> Kuhl. m.	+	+			Not Evaluated
<i>Luehea candicans</i> Mart.					Least Concern
<i>Luehea cymulosa</i> Spruce ex Benth.	+	+	+		Not Evaluated
<i>Luehea divaricata</i> Mart.	+	+	+		Not Evaluated
<i>Luehea grandiflora</i> Mart.	+				Not Evaluated
<i>Luehea ochrophylla</i> Mart.	+	+	+		Not Evaluated
<i>Luehea paniculata</i> Mart.	+				Not Evaluated
<i>Luehea speciosa</i> Willd.					Not Evaluated
<i>Pachira endecaphylla</i> (Vell.) Carv.-Sobr.	+	+			Not Evaluated
<i>Pseudobombax grandiflorum</i> (Cav.) A. Robyns	+		+		
<i>Pterygota brasiliensis</i> Allemão	+	+	+		Not Evaluated
<i>Quararibea penduliflora</i> (A. St.-Hil.) K. Schum.	+	+			Not Evaluated
<i>Quararibea turbinata</i> (Sw.) Poir.	+	+	+		Not Evaluated
<i>Spirotheca rivieri</i> (Decne.) Ulbr.	+	+	+		Least Concern
<i>Sterculia striata</i> A. St.-Hil. & Naudin	+	+	+		Not Evaluated

Melastomataceae	<i>Henriettea glabra</i> (Vell.)						
	Penneys, F.A. Michelangelii, Judd						
	et Almeda	+	+	+	+		Not Evaluated
	<i>Henriettea succosa</i> (Aubl.) DC.						Not Evaluated
	<i>Leandra acutiflora</i> (Naudin)						
	Cogn.						Not Evaluated
	<i>Leandra melastomoides</i> Raddi						Not Evaluated
	<i>Leandra regnellii</i> (Triana) Cogn.						Not Evaluated
	<i>Leandra variabilis</i> Raddi						Not Evaluated
	<i>Meriania calyptrata</i> (Naudin)						
	Triana	+	+	+	+		Not Evaluated
	<i>Meriania clausenii</i> (Naudin)						
	Triana						Not Evaluated
	<i>Miconia albicans</i> (Sw.) Triana						Not Evaluated
	<i>Miconia amacurensis</i> Wurdack	+	+	+	+		Not Evaluated
	<i>Miconia amoena</i> Triana						Least Concern
	<i>Miconia brasiliensis</i> (Spreng.)						
	Triana	+	+	+	+		Not Evaluated
	<i>Miconia buddlejoides</i> Triana						Not Evaluated
	<i>Miconia calvescens</i> DC.						Not Evaluated

<i>Miconia centrodresma</i> Naudin	+				Not Evaluated
<i>Miconia chamissois</i> Naudin					Not Evaluated
<i>Miconia ciliata</i> (Rich.) DC.	+				Not Evaluated
<i>Miconia cinerascens</i> Miq.	+	+			Not Evaluated
<i>Miconia cinnamomifolia</i> (DC.) Naudin	+	+	+	+	Not Evaluated
<i>Miconia collatata</i> Wurdack	+				Not Evaluated
<i>Miconia cubatanensis</i> Hoehne	+	+		+	Not Evaluated
<i>Miconia discolor</i> DC.	+				Not Evaluated
<i>Miconia dodecandra</i> Cogn.	+				Not Evaluated
<i>Miconia fasciculata</i> Gardner	+				Least Concern
<i>Miconia flammea</i> Casar.	+				Not Evaluated
<i>Miconia formosa</i> Cogn	+	+		+	Not Evaluated
<i>Miconia holosericea</i> (L.) DC.	+	+		+	Not Evaluated
<i>Miconia hypoleuca</i> (Benth.) Triana	+				Not Evaluated
<i>Miconia inconspicua</i> Miq.	+	+		+	Not Evaluated
<i>Miconia latecrenata</i> (DC.) Naudin	+	+			Not Evaluated
<i>Miconia lepidota</i> DC.	+	+	+	+	Not Evaluated

<i>Miconia ligustroides</i> (DC.) Naudin	+	+	+	Not Evaluated
<i>Miconia minutiflora</i> (Bonpl.) DC.	+			Not Evaluated
<i>Miconia mirabilis</i> (Aubl.) L.O.Williams				Not Evaluated
<i>Miconia nervosa</i> (Sm.) Triana				Not Evaluated
<i>Miconia octopetala</i> Cogn.				Least Concern
<i>Miconia paniculata</i> (DC.) Naudin	+	+	+	Not Evaluated
<i>Miconia prasina</i> (Sw.) DC.	+	+	+	Not Evaluated
<i>Miconia pusilliflora</i> (DC.) Naudin	+	+		Not Evaluated
<i>Miconia pyriformis</i> Naudin				Not Evaluated
<i>Miconia ramboi</i> Brade	+			Least Concern
<i>Miconia rubiginosa</i> (Bonpl.) DC.	+	+	+	Not Evaluated
<i>Miconia sellowiana</i> Naudin	+			Not Evaluated
<i>Miconia serrulata</i> (DC.) Naudin	+	+	+	Not Evaluated
<i>Miconia theaezans</i> (Bonpl.) Cogn.				Not Evaluated
<i>Miconia tomentosa</i> (Rich.) D.Don				Not Evaluated
<i>Miconia trianae</i> Cogn.				Not Evaluated
<i>Miconia tristis</i> Spring	+	+		Not Evaluated
<i>Miconia valtheri</i> Naudin	+	+	+	Not Evaluated

<i>Mouriri chamissoana</i> Cogn.	+	+	+	Not Evaluated
<i>Mouriri glazioviana</i> Cogn.		+		Not Evaluated
<i>Pleroma arboreum</i> Gardner	+	+		Not Evaluated
<i>Pleroma granulosum</i> (Desr.) D. Don		+		Not Evaluated
<i>Pleroma mutabile</i> (Vell.) Triana	+	+	+	Not Evaluated
<i>Pleroma raddianum</i> (DC.) Gardne	+	+		Not Evaluated
<i>Pleroma sellowianum</i> (Cham.) P.J.F.Guim. & Michelang.	+	+		Not Evaluated
<i>Trembleya parviflora</i> (D.Don) Cogn.		+		Not Evaluated
Meliaceae				
<i>Cabralea canjerana</i> (Vell.) Mart.	+	+	+	Not Evaluated
<i>Cedrela fissilis</i> Vell.		+	+	Vulnerable
<i>Cedrela odorata</i> L.		+		Vulnerable
<i>Guarea blanchetii</i> C.DC.	+	+		Not Evaluated
<i>Guarea guidonia</i> (L.) Sleumer		+	+	Not Evaluated
<i>Guarea kunthiana</i> A.Juss.		+	+	Not Evaluated
<i>Guarea macrophylla</i> Vahl		+		Not Evaluated
<i>Trichilia casaretii</i> C.DC.		+		Least Concern

<i>Trichilia catigua</i> A.Juss.	+	+	+	+	Not Evaluated
<i>Trichilia elegans</i> A.Juss.		+	+	+	Not Evaluated
<i>Trichilia emarginata</i> (Turcz.) C.DC.		+	+	+	Least Concern
<i>Trichilia hirta</i> L.		+			Least Concern
<i>Trichilia lepidota</i> Mart.	+	+	+	+	Least Concern
<i>Trichilia martiana</i> C.DC.	+				Not Evaluated
<i>Trichilia pallens</i> C.DC.		+	+	+	Least Concern
<i>Trichilia pallida</i> Sw.					Not Evaluated
<i>Trichilia pseudostipularis</i> (A.Juss.) C.DC.	+	+	+	+	Near Threatened
<i>Trichilia quadrijuga</i> Kunth			+	+	Not Evaluated
<i>Trichilia ramalhoi</i> Rizzini		+			Near Threatened
<i>Trichilia silvatica</i> C.DC.	+	+	+	+	Least Concern
Metteniusaceae					
<i>Emmotum affine</i> Miers					Not Evaluated
<i>Hennecartia omphalandra</i>					
Monimiaceae					
<i>J.Poiss.</i>		+			Not Evaluated
<i>Macrotorus utriculatus</i> (Mart.) Perkins		+			Least Concern

<i>Mollinedia argyrogyna</i> Perkins	+	+	+	Least Concern
<i>Mollinedia boracensis</i> Peixoto		+		Near Threatened
<i>Mollinedia clavigera</i> Tul.		+		Not Evaluated
<i>Mollinedia elegans</i> Tul.	+	+	+	Not Evaluated
<i>Mollinedia engleriana</i> Perkins	+	+		Least Concern
<i>Mollinedia gilgiana</i> Perkins		+		Least Concern
<i>Mollinedia glabra</i> (Spreng.) Perkins		+		
<i>Mollinedia lamprophylla</i> Perkins	+	+	+	Least Concern
<i>Mollinedia longifolia</i> Perkins	+	+	+	Near Threatened
<i>Mollinedia oligantha</i> Perkins		+	+	Not Evaluated
<i>Mollinedia ovata</i> Ruiz & Pav.		+		Not Evaluated
<i>Mollinedia puberula</i> Perkins		+	+	Least Concern
<i>Mollinedia schottiana</i> (Spreng.) Perkins		+		Not Evaluated
<i>Mollinedia triflora</i> (Spreng.) Tul.	+	+		Not Evaluated
<i>Mollinedia uleana</i> Perkins	+	+	+	Not Evaluated
<i>Mollinedia widgrenii</i> A.DC.		+		Not Evaluated
<i>Bagassa guianensis</i> Aubl.		+	+	Not Evaluated
<i>Brosimum gaudichaudii</i> Trécul		+	+	Not Evaluated

Moraceae

<i>Brosimum glaziovii</i> Taub.	+	+	+	+	Least Concern
<i>Brosimum guianense</i> (Aubl.) Huber					
<i>Brosimum lactescens</i> (S.Moore) C.C.Berg					
<i>Brosimum rubescens</i> Taub.					
<i>Clarisia ilicifolia</i> (Spreng.) Lanj. & Rossberg					
<i>Clarisia racemosa</i> Ruiz & Pav.					
<i>Ficus adhatodifolia</i> Schott in Spreng.					
<i>Ficus broadwayi</i> Urb.					
<i>Ficus calyptroceras</i> (Miq.) Miq.					
<i>Ficus cestrifolia</i> Schott ex Spreng.					
<i>Ficus clusiifolia</i> Schott					
<i>Ficus crocata</i> (Miq.) Miq.					
<i>Ficus enormis</i> Mart. ex Miq.					
<i>Ficus eximia</i> Schott					
<i>Ficus gomelleira</i> Kunth					
<i>Ficus guaranitica</i> Chodat					
<i>Ficus hirsuta</i> Schott					

<i>Ficus luschnathiana</i> (Miq.) Miq.	+	+	+	Not Evaluated
<i>Ficus mexiae</i> Standl.	+	+	+	Least Concern
<i>Ficus obtusifolia</i> Kunth	+			Not Evaluated
<i>Ficus obtusiuscula</i> (Miq.) Miq.		+		Not Evaluated
<i>Ficus pertusa</i> L.f.		+	+	Not Evaluated
<i>Ficus pulchella</i> Schott	+	+		Least Concern
<i>Galipea jasminiflora</i> (A.St.-Hil.) Engl.	+	+	+	Not Evaluated
<i>Helicostylis pedunculata</i> Benoist	+	+	+	Not Evaluated
<i>Helicostylis tomentosa</i> (Poepp. & Endl.) Rusby		+		
<i>Machura tinctoria</i> (L.) D.Don ex Steud.		+	+	Not Evaluated
<i>Naucleopsis oblongifolia</i> (Kuhl.) Carauta		+	+	Least Concern
<i>Pseudolmedia macrophylla</i> Trécul	+	+	+	Not Evaluated
<i>Sorocea bonplandii</i> (Baill.) W.C.Burger et al	+	+		Not Evaluated
<i>Sorocea guilleminiana</i> Gaudich.		+		Least Concern
<i>Sorocea hilarii</i> Gaudich.	+	+	+	Not Evaluated

Myristicaceae	<i>Virola bicuhyba</i> (Schott ex Spreng.) Warb.	+	+	+	Endangered
	<i>Virola gardneri</i> (A.DC.) Warb.	+	+	+	Not Evaluated
	<i>Virola officinalis</i> Warb.		+		Not Evaluated
	<i>Virola sebifera</i> Aubl.				Not Evaluated
Myrtaceae	<i>Blepharocalyx salicifolius</i> (Kunth) O.Berg	+	+	+	Least Concern
	<i>Campomanesia aromatica</i> (Aubl.) Griseb.				Least Concern
	<i>Campomanesia dichotoma</i> (O.Berg) Mattos		+		Not Evaluated
	<i>Campomanesia eugenoides</i> (Cambess.) D.Legrand ex Landrum		+		Least Concern
	<i>Campomanesia guaviroba</i> (DC.) Kiaersk.	+	+	+	Not Evaluated
	<i>Campomanesia guazumifolia</i> (Cambess.) O.Berg	+	+	+	Not Evaluated
	<i>Campomanesia ilhoensis</i> Mattos		+		Not Evaluated

<i>Campomanesia laurifolia</i> Gardner	+	+	+	+	Least Concern
<i>Campomanesia neriiflora</i> (O.Berg) Nied.	+				Least Concern
<i>Campomanesia phaea</i> (O.Berg) Landrum	+				Least Concern
<i>Campomanesia reitziana</i> D.Legrand	+	+	+	+	Vulnerable
<i>Campomanesia schlechtendaliana</i> (O.Berg) Nied.	+	+	+		Least Concern
<i>Campomanesia velutina</i> (Cambess.) O.Berg		+			
<i>Campomanesia xanthocarpa</i> (Mart.) O.Berg	+	+	+	+	Least Concern
<i>Eugenia acutata</i> Miq.		+			Not Evaluated
<i>Eugenia astringens</i> Cambess.	+	+	+	+	Not Evaluated
<i>Eugenia ayacuchae</i> Steyerl.		+	+		Not Evaluated
<i>Eugenia bacopari</i> D.Legrand	+	+	+		Not Evaluated
<i>Eugenia bahiensis</i> DC.					Least Concern
<i>Eugenia batingabranca</i> Sobral	+	+	+	+	Not Evaluated
<i>Eugenia bimarginata</i> DC.	+	+	+	+	Not Evaluated
<i>Eugenia brasiliensis</i> Lam.	+	+	+	+	Not Evaluated
<i>Eugenia brejoensis</i> Mazine	+	+	+	+	Not Evaluated

<i>Eugenia burkartiana</i> (D.Legrand)							
D.Legrand	+	+	+	+	+	+	Least Concern
<i>Eugenia candolleana</i> DC.		+					Not Evaluated
<i>Eugenia catharinae</i> O.Berg		+					Not Evaluated
<i>Eugenia catharinensis</i> D.Legrand		+	+	+	+	+	Not Evaluated
<i>Eugenia cerasiflora</i> Miq.	+	+	+	+			Least Concern
<i>Eugenia cereja</i> D.Legrand	+	+	+	+			Least Concern
<i>Eugenia chlorophylla</i> O.Berg	+	+	+	+	+	+	Not Evaluated
<i>Eugenia copacabanensis</i> Kiaersk.	+	+	+	+	+		Least Concern
<i>Eugenia disperma</i> Vell.	+	+	+	+	+		Vulnerable
<i>Eugenia dodonaeifolia</i> Cambess.	+	+	+	+	+	+	Not Evaluated
<i>Eugenia dysenterica</i> (Mart.) DC.	+	+	+	+	+	+	Not Evaluated
<i>Eugenia excelsa</i> O.Berg	+	+	+	+	+		Least Concern
<i>Eugenia expansa</i> Spring ex Mart.		+					Not Evaluated
<i>Eugenia flamingensis</i> O.Berg		+					Not Evaluated
<i>Eugenia florida</i> DC.	+	+	+	+			Least Concern
<i>Eugenia francavilleana</i> O.Berg		+	+	+	+	+	Not Evaluated
<i>Eugenia fusca</i> O.Berg		+					Not Evaluated
<i>Eugenia gracillima</i> Kiaersk.		+					Least Concern
<i>Eugenia guanabarina</i> (Mattos & D.Legrand)		+	+	+	+	+	
Giaretta & M.C.Souza		+				+	+

<i>Eugenia handroana</i> D.Legrand	+	+	+	+	Not Evaluated
<i>Eugenia handroi</i> (Mattos) Mattos	+	+	+	+	Not Evaluated
<i>Eugenia hiemalis</i> Cambess.		+			Least Concern
<i>Eugenia involucrata</i> DC.	+	+	+	+	Not Evaluated
<i>Eugenia itapemirimensis</i>					
Cambess.	+	+	+	+	Not Evaluated
<i>Eugenia kleinii</i> D.Legrand	+	+	+		Not Evaluated
<i>Eugenia ligustrina</i> (Sw.) Willd.	+	+	+	+	Not Evaluated
<i>Eugenia longipedunculata</i> Nied.	+	+	+	+	Not Evaluated
<i>Eugenia magnifica</i> Spring ex Mart.					
<i>Eugenia mandioccensis</i> O.Berg		+	+	+	Not Evaluated
<i>Eugenia mansoi</i> O.Berg		+			Not Evaluated
<i>Eugenia melanogyna</i> (D.Legrand)					
Sobral					
<i>Eugenia modesta</i> DC.		+	+	+	Not Evaluated
<i>Eugenia monosperma</i> Vell.	+		+	+	Not Evaluated
<i>Eugenia mosenii</i> (Kausel) Sobral		+			Not Evaluated
<i>Eugenia multicostata</i> D.Legrand		+			Not Evaluated
<i>Eugenia myrcianthes</i> Nied.					Not Evaluated
<i>Eugenia neomyrtifolia</i> Sobral	+	+	+	+	Not Evaluated

<i>Eugenia neoverrucosa</i> Sobral	+	+	+	+	+	Not Evaluated
<i>Eugenia nutans</i> O.Berg	+	+	+	+	+	Least Concern
<i>Eugenia pisiformis</i> Cambess.	+	+	+	+	+	Least Concern
<i>Eugenia platyphylla</i> O.Berg		+				Not Evaluated
<i>Eugenia platysema</i> O.Berg	+	+	+	+	+	Least Concern
<i>Eugenia pluriflora</i> DC.	+	+	+	+	+	Least Concern
<i>Eugenia prasina</i> O.Berg	+	+	+	+	+	Least Concern
<i>Eugenia pruinosa</i> D.Legrand	+	+	+	+	+	Endangered
<i>Eugenia pruniformis</i> Cambess.	+	+	+	+	+	Not Evaluated
<i>Eugenia puberula</i> Nied.		+				Not Evaluated
<i>Eugenia punicifolia</i> (Kunth) DC.		+				Not Evaluated
<i>Eugenia pyriformis</i> Cambess.	+	+	+	+	+	Not Evaluated
<i>Eugenia ramboi</i> D.Legrand		+	+	+	+	Not Evaluated
<i>Eugenia repanda</i> O.Berg		+				Not Evaluated
<i>Eugenia rostrifolia</i> D.Legrand	+	+	+	+	+	Not Evaluated
<i>Eugenia sonderiana</i> O.Berg	+	+	+	+	+	Not Evaluated
<i>Eugenia speciosa</i> Cambess.	+	+	+	+	+	Not Evaluated
<i>Eugenia stigmatica</i> DC.		+				Not Evaluated
<i>Eugenia subavenia</i> O.Berg	+	+	+	+	+	Not Evaluated
<i>Eugenia subglomerata</i> (Kuntze)						
Sobral	+	+	+	+	+	Not Evaluated

<i>Eugenia subterminalis</i> DC.	+				Least Concern
<i>Eugenia sulcata</i> Spring ex Mart.	+				Not Evaluated
<i>Eugenia supraaxillaris</i> Spring					Not Evaluated
<i>Eugenia tenuipedunculata</i>					
Kiaersk.	+	+			Not Evaluated
<i>Eugenia umbrosa</i> O.Berg	+	+	+		Not Evaluated
<i>Eugenia uniflora</i> L.	+				Not Evaluated
<i>Eugenia uruguayensis</i> Cambess.	+	+	+	+	Not Evaluated
<i>Eugenia vattimoana</i> Mattos	+				Vulnerable
<i>Eugenia verticillata</i> (Vell.)					
Angely	+	+	+	+	Not Evaluated
<i>Eugenia viridiflora</i> Cambess.	+	+			Not Evaluated
<i>Eugenia zuccarinii</i> O.Berg	+				Not Evaluated
<i>Feijoa sellowiana</i> (O.Berg)					
O.Berg	+	+	+	+	Not Evaluated
<i>Myrceugenia acutiflora</i> (Kiaersk.)					
D.Legrand & Kausel	+	+	+	+	Not Evaluated
<i>Myrceugenia campestris</i> (DC.)					
D.Legrand & Kausel	+	+	+	+	Least Concern
<i>Myrceugenia euosma</i> (O.Berg)					
D.Legrand	+				Not Evaluated

<i>Myrcia amplexicaulis</i> (Vell.) Hook.f.									Not Evaluated
<i>Myrcia anacardiifolia</i> Gardner								+	Not Evaluated
<i>Myrcia anceps</i> (Spreng.) O.Berg								+	Not Evaluated
<i>Myrcia bicolor</i> Kiaersk.								+	Not Evaluated
<i>Myrcia brasiliensis</i> Kiaersk.								+	Not Evaluated
<i>Myrcia crocea</i> (Vell.) Kiaersk.								+	Not Evaluated
<i>Myrcia dichrophylla</i> D.Legrand								+	Least Concern
<i>Myrcia eriocalyx</i> DC.								+	Not Evaluated
<i>Myrcia eriopus</i> DC.								+	Least Concern
<i>Myrcia eugeniopsoides</i> (D.Legrand & Kausel) Mazine								+	Not Evaluated
<i>Myrcia excoriata</i> (Mart.) E.Lucas & C.E.Wilson								+	Not Evaluated
<i>Myrcia eximia</i> DC.								+	Not Evaluated
<i>Myrcia ferruginosa</i> Mazine								+	Not Evaluated
<i>Myrcia flagellaris</i> (D.Legrand) Sobral								+	Near Threatened
<i>Myrcia glabra</i> (O.Berg) D.Legrand								+	Not Evaluated

<i>Myrcia glomerata</i> (Cambess.)									
G.P.Burton & E.Lucas	+		+	+				+	Not Evaluated
<i>Myrcia guianensis</i> (Aubl.) DC.				+					Least Concern
<i>Myrcia hartwegiana</i> (O.Berg)									
Kiaersk.									Not Evaluated
<i>Myrcia hatschbachii</i> D.Legrand				+					Not Evaluated
<i>Myrcia hebeptala</i> DC.	+			+	+			+	Not Evaluated
<i>Myrcia heringii</i> D.Legrand				+					Least Concern
<i>Myrcia ilheosensis</i> Kiaersk.				+					Not Evaluated
<i>Myrcia insigniflora</i> M.F.Santos				+	+			+	Not Evaluated
<i>Myrcia insularis</i> Gardner	+			+	+			+	Least Concern
<i>Myrcia lonchophylla</i> A.R.Lourenço & E.Lucas				+				+	+
<i>Myrcia loranthifolia</i> (DC.)									
G.P.Burton & E.Lucas	+			+	+			+	Not Evaluated
<i>Myrcia multiflora</i> (Lam.) DC.				+	+			+	Not Evaluated
<i>Myrcia multipunctata</i> Mazine	+			+					Not Evaluated
<i>Myrcia neoblanchetiana</i> E.Lucas									
& Sobral	+			+	+			+	Not Evaluated
<i>Myrcia neoclusiifolia</i>									
A.R.Lourenço & E.Lucas	+			+	+			+	Not Evaluated

<i>Myrcia neolucida</i> A.R.Lourenço & E.Lucas	+	+	+	Not Evaluated
<i>Myrcia neoobscura</i> E.Lucas & C.E.Wilson	+			Not Evaluated
<i>Myrcia neoregeliana</i> E.Lucas & C.E.Wilson	+			Not Evaluated
<i>Myrcia neorubella</i> A.R.Lourenço & E.Lucas	+			Not Evaluated
<i>Myrcia neosuaveolens</i> E.Lucas & C.E.Wilson	+			Not Evaluated
<i>Myrcia oblongata</i> DC.	+	+	+	Least Concern
<i>Myrcia obovata</i> (O.Berg) Nied.	+	+	+	Least Concern
<i>Myrcia obversa</i> (D.Legrand) E.Lucas & C.E.Wilson	+			
<i>Myrcia palustris</i> DC.	+	+	+	Not Evaluated
<i>Myrcia plusiantha</i> Kiaersk.	+			Near Threatened
<i>Myrcia pubiflora</i> DC.	+			Not Evaluated
<i>Myrcia pubipetala</i> Miq.	+	+	+	Least Concern
<i>Myrcia racemosa</i> (O.Berg) Kiaersk.	+			Not Evaluated

<i>Myrcia reitzii</i> (D.Legrand)					
Mazine	+				Not Evaluated
<i>Myrcia retorta</i> Cambess.	+	+			Not Evaluated
<i>Myrcia rupicola</i> D.Legrand	+				Endangered
<i>Myrcia selloi</i> (Spreng.) N.Silveira	+	+		+	Not Evaluated
<i>Myrcia spectabilis</i> DC.	+	+		+	Not Evaluated
<i>Myrcia splendens</i> (Sw.) DC.	+	+		+	Not Evaluated
<i>Myrcia strigipes</i> Mart.	+	+		+	Not Evaluated
<i>Myrcia strigosa</i> A.R.Lourenço & E.Lucas	+	+		+	Not Evaluated
<i>Myrcia subcordata</i> DC.	+	+			Not Evaluated
<i>Myrcia sylvatica</i> (G.Mey.) DC.	+				Not Evaluated
<i>Myrcia tenuivenosa</i> Kiaersk.	+				Not Evaluated
<i>Myrcia tijuensis</i> Kiaersk.	+	+			Least Concern
<i>Myrcia tomentosa</i> (Aubl.) DC.	+				Not Evaluated
<i>Myrcia tricona</i> (D.Legrand) A.R.Lourenço & E.Lucas				+	+
<i>Myrcia undulata</i> O.Berg	+	+			Least Concern
<i>Myrcia variabilis</i> DC.					Least Concern
<i>Myrcia vellozoi</i> Mazine	+	+			Not Evaluated
<i>Myrcia venulosa</i> DC.	+	+		+	Least Concern

<i>Myrcia vittoriana</i> Kiaersk.	+				Not Evaluated
<i>Myrcianthes gigantea</i> (D.Legrand) D.Legrand	+	+	+	+	Not Evaluated
<i>Myrcianthes pungens</i> (O.Berg) D.Legrand	+	+	+		Least Concern
<i>Myrciaria cuspidata</i> O.Berg <i>Myrciaria delicatula</i> (DC.) O.Berg					Least Concern
<i>Myrciaria ferruginea</i> O.Berg	+				Not Evaluated
<i>Myrciaria floribunda</i> (H. West ex Willd.) O.Berg	+	+	+	+	Not Evaluated
<i>Myrciaria glomerata</i> O.Berg	+				Not Evaluated
<i>Myrciaria plinioides</i> D.Legrand	+	+	+		Vulnerable
<i>Myrciaria tenella</i> (DC.) O.Berg	+	+	+	+	Data Deficient
<i>Myrrhinium atropurpureum</i> Schott					
<i>Neomitranthes cordifolia</i> (D.Legrand) D.Legrand	+	+	+	+	Not Evaluated
<i>Neomitranthes glomerata</i> (D.Legrand) D.Legrand	+			+	+

<i>Neomitranthes obscura</i> (DC.) N.Silveira	+					Least Concern
<i>Neomitranthes warmingiana</i> (Kiaersk.) Mattos	+	+	+	+		Not Evaluated
<i>Pimenta pseudocaryophyllus</i> (Gomes) Landrum	+			+		+
<i>Plinia callosa</i> Sobral	+					Endangered
<i>Plinia edulis</i> (Vell.) Sobral						Vulnerable
<i>Plinia peruviana</i> (Poir.) Govaerts	+	+	+	+		Not Evaluated
<i>Plinia pseudodichasanthia</i> (Kiaersk.) G.M.Barroso ex Sobral	+	+	+			Not Evaluated
<i>Plinia rivularis</i> (Cambess.) Rotman	+		+	+		Not Evaluated
<i>Plinia silvestris</i> (Vellozo) Mazine & Sobral	+					Not Evaluated
<i>Psidium bahianum</i> Landrum	+	+	+	+		Not Evaluated
<i>Psidium cattleianum</i> Sabine	+	+	+	+		Not Evaluated
<i>Psidium guineense</i> Sw.						Not Evaluated
<i>Psidium longipetiolatum</i> D.Legrand						
<i>Psidium myrtilloides</i> O.Berg	+					Least Concern
	+					Not Evaluated

<i>Psidium ovale</i> (Spreng.) Burret	+	+	+	+	Least Concern
<i>Psidium rufum</i> Mart. ex DC.	+	+	+	+	Not Evaluated
<i>Psidium sartorianum</i> (O.Berg)					
Nied.					
<i>Siphoneugena crassifolia</i> (DC.) Proença &					
Sobral					
<i>Siphoneugena densiflora</i> O.Berg					
<i>Siphoneugena kiaerskoviana</i>					
(Burret) Kausel	+	+	+	+	Not Evaluated
<i>Siphoneugena reitzii</i> D.Legrand					
					Least Concern
<i>Bougainvillea glabra</i> Choisy					
<i>Bougainvillea spectabilis</i> Willd.					
<i>Guapira areolata</i> (Heimerl)					
Lundell					
<i>Guapira graciliflora</i> (Mart. ex Schmidt)	+	+	+	+	Not Evaluated
Lundell					
<i>Guapira hirsuta</i> (Choisy) Lundell					
<i>Guapira laxiflora</i> (Choisy)					
Lundell					
<i>Guapira nitida</i> (Mart. ex J.A.Schmidt) Lundell					
					Not Evaluated
					+

Nyctaginaceae

<i>Guapira obtusata</i> (Jacq.) Little	+				Least Concern
<i>Guapira opposita</i> (Vell.) Reitz	+	+		+	Not Evaluated
<i>Guapira platystemon</i> (Heimerl) E.C.O.Chagas & Costa-Lima	+				
<i>Guapira venosa</i> (Choisy) Lundell	+	+		+	Not Evaluated
<i>Neea pendulina</i> Heimerl	+	+	+	+	Not Evaluated
<i>Neea verticillata</i> Ruiz & Pav.	+	+		+	Least Concern
<i>Pisonia ambigua</i> Heimerl	+	+	+	+	Least Concern
<i>Pisonia zapallo</i> Griseb.	+	+	+	+	Not Evaluated
<i>Ramisia brasiliensis</i> Oliv.	+				Not Evaluated
Ochnaceae					
<i>Elvasia tricarpellata</i> Sastre	+	+		+	Not Evaluated
<i>Ouratea castaneifolia</i> (DC.) Engl.	+				Not Evaluated
<i>Ouratea fieldingiana</i> (Gardner) Engl.	+	+		+	Not Evaluated
<i>Ouratea gigantophylla</i> (Erhard) Engl.	+				Not Evaluated
<i>Ouratea hexasperma</i> (A.St.-Hil.) Baill.	+	+		+	Not Evaluated
<i>Ouratea multiflora</i> (Pohl) Engl.	+				Not Evaluated
<i>Ouratea parviflora</i> (A.DC.) Baill.	+	+	+	+	Not Evaluated

Oleaceae	<i>Ouratea polygyna</i> Engl.	+	+	+	Not Evaluated
	<i>Ouratea sellowii</i> (Planch.) Engl.	+			Not Evaluated
	<i>Ouratea semiserrata</i> (Mart. & Nees) Engl.	+			Not Evaluated
	<i>Ouratea vaccinioides</i> (A.St.-Hil. & Tul.) Engl.	+			
	<i>Chionanthus crassifolius</i> (Mart.) P.S.Green	+	+	+	Not Evaluated
Opiliaceae	<i>Chionanthus filiformis</i> (Vell.) P.S.Green	+			Least Concern
	<i>Chionanthus trichotomus</i> (Vell.) P.S.Green	+			Not Evaluated
	<i>Agonandra brasiliensis</i> Miers ex Benth. & Hook.f.	+		+	+
Pentaphylacaceae	<i>Agonandra excelsa</i> Griseb.	+	+		Not Evaluated
	<i>Ternstroemia brasiliensis</i> Cambess.	+			Least Concern
Peraceae	<i>Chaetocarpus myrsinites</i> Baill.	+			Not Evaluated

Phyllanthaceae	<i>Pera heteranthera</i> (Schrank) I.M.Johnst.	+				Not Evaluated
	<i>Pogonophora schomburgkiana</i> Miers ex Benth.	+				
Phyllanthaceae	<i>Hyeronima alchorneoides</i> Allemão	+	+	+		Not Evaluated
	<i>Hyeronima oblonga</i> (Tul.) Müll.Arg.	+	+	+		Not Evaluated
	<i>Margaritaria nobilis</i> L.f.	+				Least Concern
	<i>Phyllanthus juglandifolius</i> Willd.	+	+	+		Not Evaluated
	<i>Richeria grandis</i> Vahl	+	+	+		Not Evaluated
	<i>Savia dictyocarpa</i> Müll.Arg.	+	+	+		Least Concern
	<i>Gallesia integrifolia</i> (Spreng.) Harms	+				Not Evaluated
	<i>Phytolacca dioica</i> L. <i>Seguieria aculeata</i> Jacq. <i>Seguieria americana</i> L. <i>Seguieria langsdorffii</i> Moq.	+	+	+	+	Not Evaluated Not Evaluated Least Concern Least Concern

Picramniaceae	<i>Picramnia andrade-limae</i> Pirani	+	+	+	Not Evaluated
	<i>Picramnia ciliata</i> Mart.				Not Evaluated
	<i>Picramnia gardneri</i> Planch.	+			Not Evaluated
	<i>Picramnia glazioviana</i> Engl.	+			Not Evaluated
	<i>Picramnia parvifolia</i> Engl.	+			Least Concern
	<i>Picramnia ramiflora</i> Planch.	+			Not Evaluated
	<i>Picramnia sellowii</i> Planch.				Least Concern
Piperaceae	<i>Piper aduncum</i> L.				Not Evaluated
	<i>Piper amalago</i> L.	+			Not Evaluated
	<i>Piper arboreum</i> Aubl.	+			Not Evaluated
	<i>Piper cernuum</i> Vell.	+	+	+	Not Evaluated
	<i>Piper dilatatum</i> Rich.	+			Not Evaluated
	<i>Piper gaudichaudianum</i> Kunth	+			Not Evaluated
	<i>Piper tuberculatum</i> Jacq.				Not Evaluated
	<i>Piper xylosteoides</i> (Kunth) Steud.	+			Least Concern
Poaceae	<i>Chusquea sellowii</i> Rupr.	+	+	+	Not Evaluated
Polygalaceae	<i>Acanthocladus pulcherrimus</i> (Kuhl.)				
	J.F.B.Pastore & D.B.O.S.Cardoso	+		+	+

Bredemeyera laurifolia (A.St.-Hil. & Moq.)

Klotzsch ex A.W.Benn.

+

Polygonaceae

Coccoloba alnifolia Casar.

+

+

+

Not Evaluated

Coccoloba declinata (Vell.) Mart.

+

+

+

Not Evaluated

Coccoloba glaziovii Lindau

+

Not Evaluated

Coccoloba laevis Casar.

+

+

+

Not Evaluated

Coccoloba latifolia Lam.

+

+

Not Evaluated

Coccoloba mollis Casar.

+

Not Evaluated

Coccoloba warmingii Meisn.

+

+

Not Evaluated

Ruprechtia laxiflora Meisn.

+

+

Not Evaluated

Triplaris americana L.

Not Evaluated

Triplaris gardneriana Wedd.

+

Not Evaluated

Primulaceae

Ardisia guianensis (Aubl.) Mez

+

+

+

Not Evaluated

Cybianthus brasiliensis (Mez)

Not Evaluated

G.Agostini

Not Evaluated

Cybianthus densiflorus Miq.

+

+

+

Not Evaluated

Cybianthus peruvianus (A.DC.)

Not Evaluated

Miq.

+

Not Evaluated

<i>Geissanthus ambiguus</i> (Mart.)					
G.Agostini	+				Not Evaluated
<i>Myrsine balansae</i> (Mez) Otegui	+	+		+	Not Evaluated
<i>Myrsine coriacea</i> (Sw.) R.Br. ex Roem. & Schult.	+	+			Not Evaluated
<i>Myrsine gardneriana</i> A.DC	+				Not Evaluated
<i>Myrsine guianensis</i> (Aubl.) Kuntze	+	+		+	Not Evaluated
<i>Myrsine hermogenesii</i> (Jung- Mend. & Bernacci) M.F.Freitas & Kin.-Gouv.	+	+		+	Not Evaluated
<i>Myrsine laetevirens</i> (Mez) Arechav.	+	+			Not Evaluated
<i>Myrsine lancifolia</i> Mart.	+				Not Evaluated
<i>Myrsine loefgrenii</i> (Mez) Imkhan.	+	+			Not Evaluated
<i>Myrsine parvula</i> (Mez) Otegui	+	+		+	Not Evaluated
<i>Myrsine umbellata</i> Mart.	+				Not Evaluated
<i>Myrsine venosa</i> A.DC.	+	+			Not Evaluated
<i>Stylogyne lhotzkyana</i> (A.DC.) Mez	+	+		+	Not Evaluated

Proteaceae	<i>Euplassa cantareirae</i> Sleumer	+	+	+	+	+	Endangered
	<i>Euplassa legalis</i> (Vell.) I.M.Johnst.	+	+	+	+	+	Not Evaluated
	<i>Roupala consimilis</i> Mez		+				Not Evaluated
	<i>Roupala meisneri</i> Sleumer	+	+	+	+	+	Not Evaluated
	<i>Roupala montana</i> Aubl.		+	+	+	+	Not Evaluated
	<i>Roupala paulensis</i> Sleumer	+	+	+	+	+	Not Evaluated
Putranjivaceae	<i>Drypetes sessiliflora</i> Allemão	+	+			+	Not Evaluated
Quinaceae	<i>Lacunaria crenata</i> (Tul.) A.C.Sm.	+	+	+	+	+	Not Evaluated
	<i>Quiina cruegeriana</i> Griseb.		+	+	+	+	Not Evaluated
	<i>Quiina glaziovii</i> Engl.	+	+	+	+	+	Not Evaluated
	<i>Quillaja lancifolia</i> D.Don	+	+	+	+	+	Not Evaluated
Rhamnaceae	<i>Colubrina glandulosa</i> Perkins	+	+				Least Concern
	<i>Rhamnidium elaeocarpum</i> Reissek	+	+	+			Not Evaluated
	<i>Sarcomphalus platyphyllus</i> (Reissek) Hauenschild	+	+	+			Not Evaluated
	<i>Scutia buxifolia</i> Reissek		+				Not Evaluated

Rhizophoraceae	<i>Paradrypetes ilicifolia</i> Kuhl.				Near Threatened
Rosaceae	<i>Prunus brasiliensis</i> (Cham. & Schltdl.) D.Dietr.	+			
	<i>Prunus myrtifolia</i> (L.) Urb.	+	+	+	Not Evaluated
Rubiaceae	<i>Bathysa australis</i> (A.St.-Hil.) K.Schum.	+			Least Concern
	<i>Bathysa gymnocarpa</i> K.Schum.	+			Not Evaluated
	<i>Bathysa mendoncae</i> K.Schum.	+	+	+	Not Evaluated
	<i>Bathysa nicholsonii</i> K.Schum.	+			Not Evaluated
	<i>Bathysa stipulata</i> (Vell.) C.Presl	+			Not Evaluated
	<i>Chomelia brasiliana</i> A.Rich.	+			Not Evaluated
	<i>Chomelia obtusa</i> Cham. & Schltdl.	+			Not Evaluated
	<i>Chomelia pedunculosa</i> Benth.	+			Not Evaluated
	<i>Chomelia pohliana</i> Müll.Arg.	+			Not Evaluated
	<i>Chomelia pubescens</i> Cham. & Schltdl.	+			Not Evaluated

<i>Cordia concolor</i> (Cham.) Kuntze	+	+	+	+	Not Evaluated
<i>Cordia macrophylla</i> (K. Schum.) Kuntze	+	+	+	+	Not Evaluated
<i>Cordia myrciifolia</i> (K. Schum.) C.H. Perss. & Delprete					
<i>Cordia sessilis</i> (Vell.) Kuntze	+	+	+	+	Not Evaluated
<i>Coussarea accedens</i> Müll.Arg.	+	+	+	+	Not Evaluated
<i>Coussarea contracta</i> (Walp.) Müll.Arg.	+				Not Evaluated
<i>Coussarea hydrangeifolia</i> (Benth.) Müll.Arg.		+			+
<i>Coussarea ilheotica</i> Müll.Arg.	+				Not Evaluated
<i>Coussarea meridionalis</i> (Vell.) Müll.Arg.	+				Not Evaluated
<i>Coussarea nodosa</i> (Benth.) Müll.Arg.					
<i>Coussarea platyphylla</i> Müll.Arg.	+	+	+	+	Least Concern
<i>Coutarea hexandra</i> (Jacq.) K. Schum.	+				Not Evaluated
<i>Eumachia cymuligera</i> (Müll. Arg.) C.M. Taylor & Razafim.	+				Not Evaluated

<i>Faramea hyacinthina</i> Mart.	+			Not Evaluated
<i>Faramea latifolia</i> (Cham. & Schltdl.) DC.	+	+	+	Not Evaluated
<i>Faramea montevidensis</i> (Cham. & Schltdl.) DC.	+			
<i>Faramea multiflora</i> A.Rich. in DC.	+			Not Evaluated
<i>Faramea oligantha</i> Müll.Arg.	+			Not Evaluated
<i>Faramea pachyantha</i> Müll.Arg.	+	+	+	Not Evaluated
<i>Faramea stipulacea</i> (Cham. & Schltdl.) DC.	+	+	+	Not Evaluated
<i>Ferdinandusa edmundoi</i> Sucre	+	+	+	Not Evaluated
<i>Genipa americana</i> L.	+			Least Concern
<i>Guettarda platypoda</i> DC.	+			Not Evaluated
<i>Guettarda uruguensis</i> Cham. & Schltdl.	+			Not Evaluated
<i>Guettarda viburnoides</i> Cham. & Schltdl.	+	+	+	Not Evaluated
<i>Hamelia patens</i> Jacq.				Not Evaluated
<i>Hillia parasitica</i> Jacq.				Least Concern
<i>Ixora gardneriana</i> Benth.	+	+	+	Not Evaluated

<i>Ixora venulosa</i> Benth.	+	+	+	Not Evaluated
<i>Machaonia acuminata</i> Bonpl.	+	+		Not Evaluated
<i>Palicourea brachypoda</i> (Müll.Arg.) L.B.Sm. & Downs	+			
<i>Palicourea brevicollis</i> (Müll.Arg.) C.M.Taylor	+			Not Evaluated
<i>Palicourea colorata</i> (Willd. ex Roem. & Schult.) Delprete & J.H.Kirkbr.	+			
<i>Palicourea deflexa</i> (DC.) Borhidi	+			Not Evaluated
<i>Palicourea dichotoma</i> (Rudge) Delprete & J.H.Kirkbr.	+			
<i>Palicourea guianensis</i> Aubl.	+			Not Evaluated
<i>Palicourea mamillaris</i> (Müll.Arg.) C.M.Taylor	+			
<i>Palicourea racemosa</i> (Aubl.) G.Nicholson	+			Not Evaluated
<i>Palicourea sessilis</i> (Vell.) C.M.Taylor	+	+	+	Not Evaluated
<i>Palicourea violacea</i> (Aubl.) A.Rich.	+			Not Evaluated
<i>Posoqueria acutifolia</i> Mart.	+	+	+	Not Evaluated

<i>Posoqueria latifolia</i> (Rudge)				
Schult.	+			Least Concern
<i>Psychotria brachyceras</i> Müll.Arg.	+			Not Evaluated
<i>Psychotria carthagenensis</i> Jacq.	+			Not Evaluated
<i>Psychotria fluminensis</i> Vell.	+			Not Evaluated
<i>Psychotria hastisepala</i> Müll.Arg.				Not Evaluated
<i>Psychotria laciniata</i> Vell.	+			Not Evaluated
<i>Psychotria leiocarpa</i> Cham. &				
Schltl.	+			Not Evaluated
<i>Psychotria nemorosa</i> Gardner	+			Not Evaluated
<i>Psychotria nuda</i> (Cham. &				
Schltl.) Wawra	+	+		Not Evaluated
<i>Psychotria pedunculosa</i> Rich.	+			Not Evaluated
<i>Psychotria suterella</i> Müll.Arg.	+	+		Not Evaluated
<i>Randia armata</i> (Sw.) DC	+	+	+	Not Evaluated
<i>Randia ferox</i> (Cham. & Schltl.)				
DC.	+			Not Evaluated
<i>Rudgea coriacea</i> (Spreng.)				
K.Schum.	+			Not Evaluated
<i>Rudgea coronata</i> (Vell.)				
Müll.Arg.		+	+	Least Concern

<i>Rudgea gardenioides</i> (Cham.) Müll.Arg.					Not Evaluated
<i>Rudgea jacobinensis</i> Müll.Arg.	+	+	+		Not Evaluated
<i>Rudgea jasminoides</i> (Cham.) Müll.Arg.				+	Vulnerable
<i>Rudgea recurva</i> Müll.Arg.	+	+	+		Not Evaluated
<i>Rudgea sessilis</i> (Vell.) Müll.Arg.	+	+	+	+	Least Concern
<i>Rudgea vellerea</i> Müll.Arg.	+				Near Threatened
<i>Rustia formosa</i> (Cham. & Schtdl.) Klotzsch	+				Not Evaluated
<i>Salzmannia nitida</i> DC.	+				Not Evaluated
<i>Schizocalyx cuspidatus</i> (A.St.-Hil.) Kainul. & B. Bremer	+	+			Not Evaluated
<i>Simira alba</i> (Mart.) Delprete, Margalho & Groppo					
<i>Simira hexandra</i> (S.Moore)					
Steyerm.	+	+	+	+	Not Evaluated
<i>Simira sampaioana</i> (Standl.) Steyerm.	+	+	+	+	Not Evaluated
<i>Tocoyena brasiliensis</i> Mart.	+				Not Evaluated

<i>Pilocarpus giganteus</i> Engl.	+	+	+	Near Threatened
<i>Pilocarpus microphyllus</i> Stapf ex Wardlew.	+	+	+	Endangered
<i>Pilocarpus pauciflorus</i> A.St.-Hil.	+	+	+	Not Evaluated
<i>Pilocarpus pennatifolius</i> Lem.	+	+	+	Not Evaluated
<i>Pilocarpus spicatus</i> A.St.-Hil.	+			Not Evaluated
<i>Zanthoxylum acuminatum</i> (Sw.) Sw.				Not Evaluated
<i>Zanthoxylum caribaeum</i> Lam.	+	+	+	Not Evaluated
<i>Zanthoxylum fagara</i> (L.) Sarg.	+	+		Not Evaluated
<i>Zanthoxylum kleinii</i> (R.S.Cowan) P.G.Waterman	+	+	+	Not Evaluated
<i>Zanthoxylum monogynum</i> A.St.-Hil.	+			Not Evaluated
<i>Zanthoxylum nemorale</i> Mart.	+			Not Evaluated
<i>Zanthoxylum petiolare</i> A.St.-Hil. & Tul.	+			Least Concern
<i>Zanthoxylum rhoifolium</i> Lam.	+	+	+	Not Evaluated
<i>Zanthoxylum riedelianum</i> Engl.	+	+	+	Not Evaluated
<i>Zanthoxylum tingoassuiba</i> A.St.-Hil.				Not Evaluated

Sabiaceae	<i>Meliosma sellowii</i> Urb.	+	+	+	+	Not Evaluated
Salicaceae	<i>Banara brasiliensis</i> (Schott) Benth.	+	+	+	+	Least Concern
	<i>Banara parviflora</i> (A.Gray) Benth.	+	+	+		Not Evaluated
	<i>Banara serrata</i> (Vell.) Warb.	+	+	+		Not Evaluated
	<i>Banara tomentosa</i> Clos	+	+	+		Not Evaluated
	<i>Casearia aculeata</i> Jacq		+	+	+	Not Evaluated
	<i>Casearia arborea</i> (Rich.) Urb.		+			Not Evaluated
	<i>Casearia bahiensis</i> Sleumer		+			Not Evaluated
	<i>Casearia decandra</i> Jacq.		+	+	+	Not Evaluated
	<i>Casearia gossypiosperma</i> Briq.		+			Least Concern
	<i>Casearia javitensis</i> Kunth		+	+	+	Not Evaluated
	<i>Casearia lasiophylla</i> Eichler		+			Least Concern
	<i>Casearia mariquitensis</i> Kunth		+			Not Evaluated
	<i>Casearia obliqua</i> Spreng.	+	+	+	+	Not Evaluated
	<i>Casearia oblongifolia</i> Cambess.		+			Not Evaluated
	<i>Casearia paranaensis</i> Sleumer	+	+	+	+	Vulnerable
	<i>Casearia pauciflora</i> Cambess.	+	+	+		Least Concern

<i>Casearia rupestris</i> Eichler	+				Not Evaluated
<i>Casearia selloana</i> Eichler	+	+	+	+	Not Evaluated
<i>Casearia sylvestris</i> Sw.	+		+	+	Not Evaluated
<i>Casearia ulmifolia</i> Vahl ex Vent.	+		+	+	Not Evaluated
<i>Macrothumia kuhlmannii</i> (Sleumer) M.H.Alford	+	+	+	+	Not Evaluated
<i>Prockia crucis</i> P.Browne ex L.	+				Not Evaluated
<i>Salix humboldtiana</i> Willd.	+				Least Concern
<i>Xylosma ciliatifolia</i> (Clos) Eichler	+				Not Evaluated
<i>Xylosma glaberrima</i> Sleumer	+	+	+		Near Threatened
<i>Xylosma prockia</i> (Turcz.) Turcz.	+	+	+	+	Not Evaluated
<i>Xylosma pseudosalzmannii</i>					
Sleumer	+	+	+		Not Evaluated
<i>Xylosma venosa</i> N.E.Br.	+	+	+		Not Evaluated
<i>Allophylus semidentatus</i> (Miq.) Radlk.	+	+	+	+	Least Concern
<i>Cupania bracteosa</i> Radlk.	+				Not Evaluated
<i>Cupania concolor</i> Radlk.	+	+	+		Vulnerable
<i>Cupania emarginata</i> Cambess.	+				Not Evaluated
<i>Cupania furfuracea</i> Radlk.	+	+	+		Vulnerable

<i>Cupania impressinervia</i> Acev.- Rodr.	+	+	+	+	Not Evaluated
<i>Cupania ludowigii</i> Somner & Ferrucci	+				Not Evaluated
<i>Cupania oblongifolia</i> Mart.	+	+	+	+	Not Evaluated
<i>Cupania racemosa</i> (Vell.) Radlk.	+	+	+	+	Not Evaluated
<i>Cupania rugosa</i> Radlk.					Not Evaluated
<i>Cupania scrobiculata</i> Rich.		+	+	+	Not Evaluated
<i>Cupania vernalis</i> Cambess.	+	+	+	+	Not Evaluated
<i>Cupania zanthoxyloides</i> Radlk.	+	+	+	+	Not Evaluated
<i>Diatenopteryx sorbifolia</i> Radlk.	+	+	+	+	Not Evaluated
<i>Dilodendron bipinnatum</i> Radlk.	+	+	+	+	Least Concern
<i>Dodonaea viscosa</i> Jacq.	+	+	+	+	Not Evaluated
<i>Magonia pubescens</i> A.St.-Hil.					Least Concern
<i>Matayba discolor</i> (Spreng.) Radlk.	+				Not Evaluated
<i>Matayba elaeagnoides</i> Radlk.	+	+	+	+	Not Evaluated
<i>Matayba guianensis</i> Aubl.	+				Not Evaluated
<i>Matayba intermedia</i> Radlk.	+				Not Evaluated
<i>Matayba juglandifolia</i> (Cambess.) Radlk.	+	+	+	+	Not Evaluated

<i>Melicoccus oliviformis</i> Kunth	+				Not Evaluated
<i>Pseudima frutescens</i> (Aubl.) Radlk.	+	+	+	+	Not Evaluated
<i>Sapindus saponaria</i> L.	+				Not Evaluated
<i>Scyphonochium multiflorum</i> (Mart.) Radlk.	+				Not Evaluated
<i>Serjania glabrata</i> Kunth	+	+	+	+	Not Evaluated
<i>Talisia cerasina</i> (Benth.) Radlk.					Not Evaluated
<i>Talisia esculenta</i> (Cambess.) Radlk.	+	+	+	+	Not Evaluated
<i>Talisia macrophylla</i> (Mart.) Radlk.	+	+	+	+	Not Evaluated
<i>Chrysophyllum flexuosum</i> Mart.	+	+	+	+	Least Concern
<i>Chrysophyllum gonocarpum</i> (Mart. & Eichler ex Miq.) Engl.	+				
<i>Chrysophyllum inornatum</i> Mart.	+	+	+	+	Least Concern
<i>Chrysophyllum lucentifolium</i> Cronquist	+	+	+	+	Not Evaluated
<i>Chrysophyllum marginatum</i> (Hook. & Arn.) Radlk.	+	+	+	+	Not Evaluated

Sapotaceae

<i>Chrysophyllum rufum</i> Mart.						Not Evaluated
<i>Chrysophyllum splendens</i> Spreng.	+	+	+	+	+	Near Threatened
<i>Chrysophyllum viride</i> Mart. & Eichler		+				Near Threatened
<i>Diploon cuspidatum</i> (Hoehe)						
Cronquist	+	+	+	+	+	Not Evaluated
<i>Ecclinusa ramiflora</i> Mart.		+	+	+	+	Not Evaluated
<i>Manilkara longifolia</i> (A.DC.)						
Dubard	+	+	+	+	+	Near Threatened
<i>Manilkara maxima</i> T.D.Penn.						Endangered
<i>Manilkara multifida</i> T.D.Penn.		+				Vulnerable
<i>Manilkara rufula</i> (Miq.) H.J.Lam		+				Least Concern
<i>Manilkara salzmannii</i> (A.DC.)						
H.J.Lam	+	+				Not Evaluated
<i>Manilkara subsericea</i> (Mart.)						
Dubard	+	+	+	+	+	Least Concern
<i>Micropholis crassipedicellata</i> (Mart. & Eichler) Pierre		+			+	+
<i>Micropholis gardneriana</i> (A.DC.)						
Pierre	+	+	+	+	+	Not Evaluated

<i>Micropholis guyanensis</i> (A.DC.) Pierre			+	+	Not Evaluated
<i>Micropholis venulosa</i> (Mart. & Eichler) Pierre	+				
<i>Mimusops coriacea</i> (A.DC.) Miq.	+	+	+	+	Not Evaluated
<i>Pouteria bangii</i> (Rusby) T.D.Penn.				+	Not Evaluated
<i>Pouteria beaurepairei</i> (Glaz. & Raunk.) Baehni	+				
<i>Pouteria bullata</i> (S.Moore) Baehni				+	Endangered
<i>Pouteria butyrocarpa</i> (Kuhlmann.) T.D.Penn.	+	+			Critically Endangered
<i>Pouteria caimito</i> (Ruiz & Pav.) Radlk.				+	Not Evaluated
<i>Pouteria cuspidata</i> (A.DC.) Baehni	+				Not Evaluated
<i>Pouteria durlandii</i> (Standl.) Baehni	+				Not Evaluated
<i>Pouteria filipes</i> Eyma	+			+	Not Evaluated
<i>Pouteria gardneri</i> (Mart. & Miq.) Baehni	+			+	Not Evaluated

<i>Pouteria gardneriana</i> (A.DC.) Radlk.		+	+	+	Not Evaluated
<i>Pouteria glomerata</i> (Miq.) Radlk.	+	+	+	+	Least Concern
<i>Pouteria grandiflora</i> (A.DC.) Baehni		+	+	+	Least Concern
<i>Pouteria guianensis</i> Aubl.	+	+	+	+	Not Evaluated
<i>Pouteria macrophylla</i> (Lam.) Eyma		+			Not Evaluated
<i>Pouteria microstrigosa</i> T.D.Penn. <i>Pouteria procera</i> (Mart.) K.Hammer					Data Deficient
<i>Pouteria psammophila</i> (Mart.) Radlk.		+	+	+	Not Evaluated
<i>Pouteria reticulata</i> (Engl.) Eyma <i>Pouteria salicifolia</i> (Spreng.) Radlk.		+	+		Least Concern
<i>Pouteria torta</i> (Mart.) Radlk.		+			Least Concern
<i>Pouteria venosa</i> (Mart.) Baehni <i>Pradosia lactescens</i> (Vell.) Radlk.		+			Not Evaluated
<i>Sarcaulus brasiliensis</i> (A.DC.) Eyma	+	+	+	+	Least Concern
					Not Evaluated

Sideroxylon obtusifolium (Roem. & Schult.)

T.D.Penn.

+

Schoepfiaceae

Schoepfia brasiliensis A.DC.

+

Not Evaluated

Homalolepis cedron (Planch.) Devecchi &

Simaroubaceae

Pirani

+

+

Picrasma crenata (Vell.) Engl.

+

Least Concern

Simaba guianensis Aubl.

+

Not Evaluated

Simarouba amara Aubl.

+

Not Evaluated

Simarouba versicolor A.St.-Hil.

+

Not Evaluated

Siparuna brasiliensis (Spreng.)

Siparunaceae

A.DC.

+

Least Concern

Siparuna cymosa Tolm.

+

Not Evaluated

Siparuna glycycarpa (Ducke) Renner &

Hausner

Siparuna guianensis Aubl.

+

Not Evaluated

Siparuna reginae (Tul.) A.DC.

+

Least Concern

Solanaceae

Iochroma arborescens (L.) J.M.H.

Shaw

Not Evaluated

Athenaea fasciculata (Vell.)

I.M.C. Rodrigues & Stehmann

Not Evaluated

Athenaea velutina (Sendtn.)

D'Arcy

Not Evaluated

Brunfelsia australis Benth.

Not Evaluated

Brunfelsia brasiliensis (Spreng.) L.B.Sm. &

Downs

Brunfelsia cuneifolia J.A.Schmidt

Not Evaluated

Brunfelsia pilosa Plowman

Not Evaluated

Brunfelsia uniflora (Pohl) D.Don

Not Evaluated

Cestrum axillare Vell.

Not Evaluated

Cestrum bracteatum Link & Otto

Not Evaluated

Cestrum intermedium Sendtn.

Not Evaluated

Cestrum schlechtendalii G.Don

Not Evaluated

Cestrum strigilatum Ruiz & Pav.

Not Evaluated

Dyssochroma viridiflorum (Sims)

Miers

Not Evaluated

Physalis pubescens L.

Not Evaluated

Sessea brasiliensis Toledo

Near Threatened

<i>Solanum alatirameum</i> Bitter	+	+	+	+	Not Evaluated
<i>Solanum americanum</i> Mill.	+	+			Not Evaluated
<i>Solanum bullatum</i> Vell.	+	+	+		Least Concern
<i>Solanum caavurana</i> Vell.		+			Not Evaluated
<i>Solanum campaniforme</i> Roem. & Schult.		+			Not Evaluated
<i>Solanum cernuum</i> Vell.		+			Not Evaluated
<i>Solanum cinnamomeum</i> Sendtn.		+	+	+	Least Concern
<i>Solanum corymbiflorum</i> (Sendtn.) Bohs	+	+	+	+	Not Evaluated
<i>Solanum leucodendron</i> Sendtn.		+			Least Concern
<i>Solanum mauritianum</i> Scop.		+			Not Evaluated
<i>Solanum melissarum</i> Bohs		+			Least Concern
<i>Solanum pseudoquina</i> A.St.-Hil.	+	+	+	+	Least Concern
<i>Solanum reitzii</i> L.B.Sm. & Downs			+	+	Near Threatened
<i>Solanum rupicola</i> Sendtn					Not Evaluated
<i>Solanum sanctae-catharinae</i>					
Dunal	+	+	+		Not Evaluated
<i>Solanum scuticum</i> M.Nee		+			Not Evaluated

	<i>Solanum swartzianum</i> Roem. & Schult.	+	+	+	+	Not Evaluated
	<i>Solanum variabile</i> Mart.	+	+	+	+	Not Evaluated
	<i>Solanum vellozianum</i> Dunal					Not Evaluated
	<i>Vassobia breviflora</i> (Sendtn.) Hunz.					Not Evaluated
Stemonuraceae	<i>Discophora guianensis</i> Miers		+			Not Evaluated
Strombosiaceae	<i>Tetrastylidium grandifolium</i> (Baill.) Sleumer	+	+	+	+	Not Evaluated
Styracaceae	<i>Styrax acuminatus</i> Pohl	+	+	+	+	Least Concern
	<i>Styrax camporum</i> Pohl		+	+	+	Not Evaluated
	<i>Styrax glabratus</i> Schott					Not Evaluated
	<i>Styrax latifolius</i> Pohl		+			Not Evaluated
	<i>Styrax leprosus</i> Hook. & Arn.		+	+	+	Not Evaluated
Symplocaceae	<i>Symplocos celastrinea</i> Mart.		+			Not Evaluated
	<i>Symplocos estrellensis</i> Casar.		+			Not Evaluated

<i>Symplocos glandulosomarginata</i>					
Hoehne	+				Not Evaluated
<i>Symplocos laxiflora</i> Benth.	+				Not Evaluated
<i>Symplocos nitens</i> (Pohl) Benth.	+		+	+	Not Evaluated
<i>Symplocos oblongifolia</i> Casar.	+		+	+	Not Evaluated
<i>Symplocos pubescens</i> Klotzsch ex Benth.	+				Not Evaluated
<i>Symplocos tenuifolia</i> Brand	+	+	+	+	Least Concern
<i>Symplocos tetrandra</i> Mart.	+				Not Evaluated
<i>Symplocos uniflora</i> (Pohl) Benth.	+	+	+		Not Evaluated
Thymelaeaceae					
<i>Daphnopsis brasiliensis</i> Mart.	+				Not Evaluated
<i>Daphnopsis fasciculata</i> (Meisn.) Nevl. Nevling	+	+	+		Not Evaluated
<i>Daphnopsis racemosa</i> Griseb.	+				Not Evaluated
<i>Daphnopsis schwackeana</i> Taub.	+				Not Evaluated
Urticaceae					
<i>Boehmeria caudata</i> Sw.	+	+	+	+	Not Evaluated
<i>Cecropia glaziovii</i> Snehl.	+	+	+	+	Not Evaluated
<i>Cecropia hololeuca</i> Miq.	+	+	+	+	Not Evaluated
<i>Cecropia pachystachya</i> Trécul	+	+	+	+	Not Evaluated

<i>Cecropia palmata</i> Willd.	+			Not Evaluated
<i>Coussapoa microcarpa</i> (Schott) Rizzini	+	+	+	Not Evaluated
<i>Coussapoa pachyphylla</i> Akkermans & C.C.Berg				
<i>Pourouma guianensis</i> Aubl.	+	+	+	Not Evaluated
<i>Pourouma mollis</i> Trécul	+	+	+	Not Evaluated
<i>Pourouma velutina</i> Mart. ex Miq.	+	+	+	Not Evaluated
<i>Urera aurantiaca</i> Wedd.	+			Not Evaluated
<i>Urera baccifera</i> (L.) Gaudich. ex Wedd.	+	+	+	Not Evaluated
<i>Urera caracasana</i> (Jacq.) Griseb.				Not Evaluated
<i>Urera nitiida</i> (Vell.) P.Brack	+			Not Evaluated
<i>Aloysia virgata</i> (Ruiz & Pav.) Juss.	+			Not Evaluated
<i>Citharexylum myrianthum</i> Cham.	+	+	+	Not Evaluated
<i>Citharexylum solanaceum</i> Cham.	+	+	+	Not Evaluated
<i>Recordia reitzii</i> (Moldenke) N.O'Leary & V.Thode	+			

Verbenaceae

Violaceae	<i>Amphirrhox longifolia</i> (A.St.-Hil.) Spreng.	+			Not Evaluated
	<i>Paypayrola blanchetiana</i> Tul.	+	+	+	Not Evaluated
	<i>Rinorea bahiensis</i> (Moric.) Kuntze	+			Not Evaluated
	<i>Rinorea guianensis</i> Aubl.	+			Not Evaluated
Vochysiaceae	<i>Callisthene fasciculata</i> Mart.				Not Evaluated
	<i>Callisthene major</i> Mart.	+	+	+	Not Evaluated
	<i>Callisthene microphylla</i> Warm.				Not Evaluated
	<i>Callisthene minor</i> Mart.	+	+	+	Not Evaluated
	<i>Qualea cordata</i> Spreng.	+	+	+	Not Evaluated
	<i>Qualea dichotoma</i> (Mart.) Warm	+			Not Evaluated
	<i>Qualea gestasiana</i> A.St.-Hil.	+			Not Evaluated
	<i>Qualea grandiflora</i> Mart.	+			Not Evaluated
	<i>Qualea multiflora</i> Mart.	+			Not Evaluated
	<i>Vochysia bifalcata</i> Warm.	+			Not Evaluated
	<i>Vochysia magnifica</i> Warm.	+	+		Not Evaluated
	<i>Vochysia oppugnata</i> (Vell.) Warm.				
		+	+	+	Not Evaluated
	<i>Vochysia riedeliana</i> Stafleu				Near Threatened

<i>Vochysia schwackeana</i> Warm.	+	+	+	Not Evaluated
<i>Vochysia tucanorum</i> Mart.	+	+	+	Not Evaluated
Winteraceae				
<i>Drimys brasiliensis</i> Miers		+		Least Concern